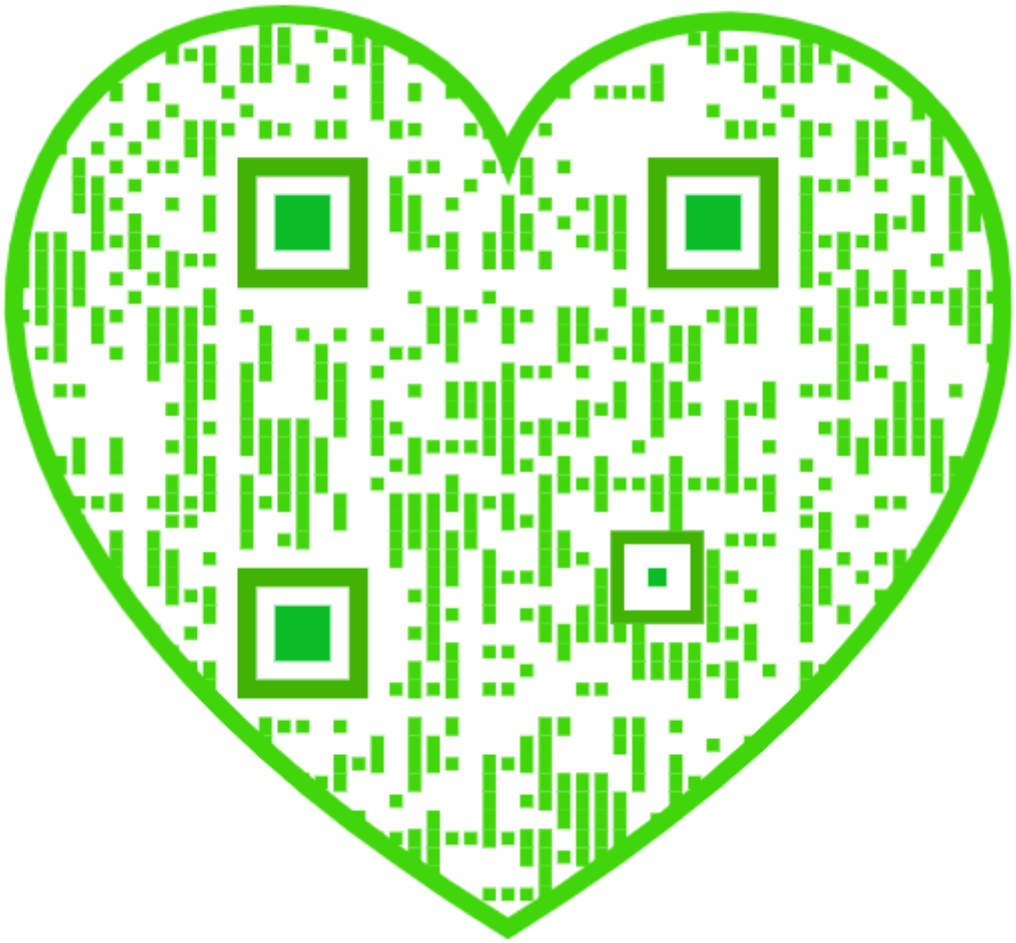

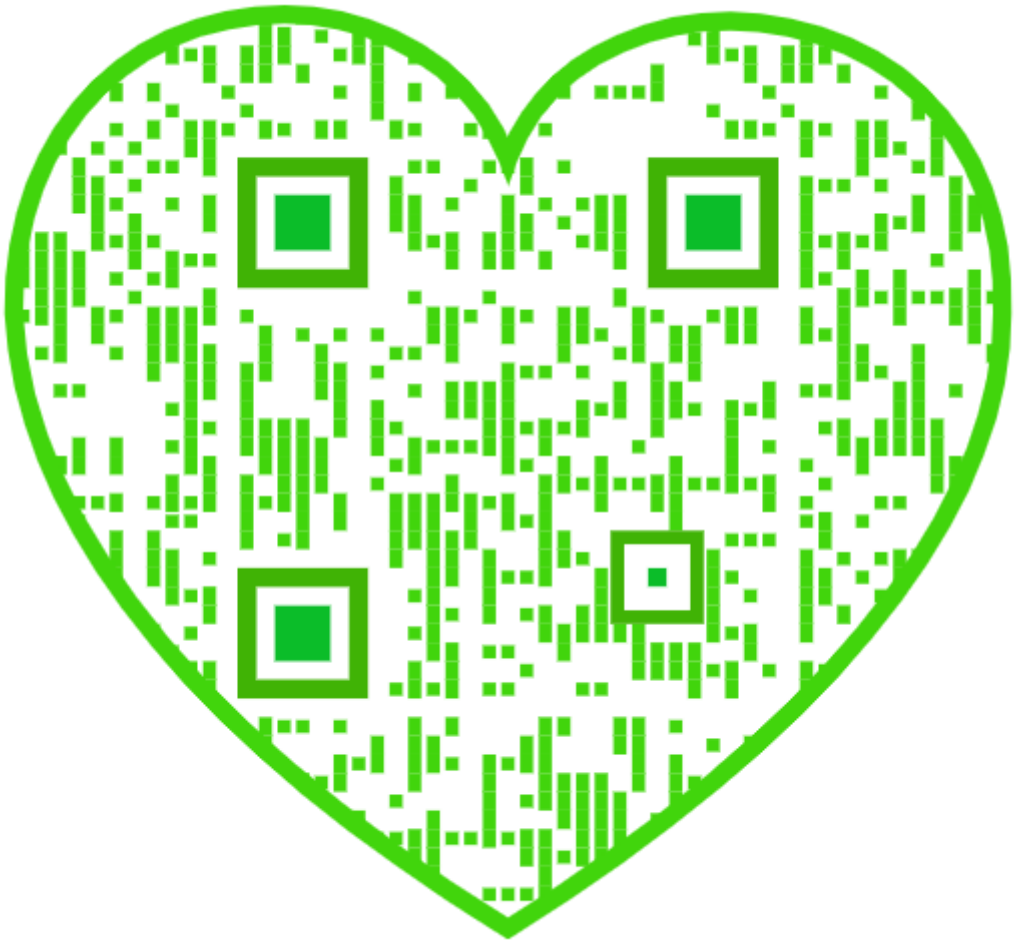

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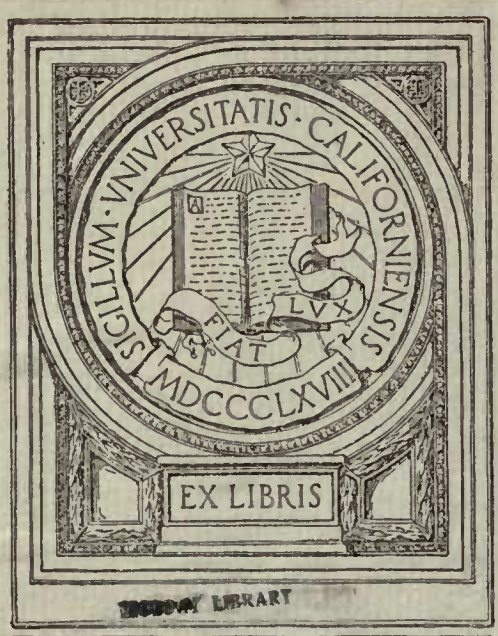

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VOL. II.

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LABATIA; (so called from the celebrated Dominican friar, Father Labat,) a genus of the class Tetrandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth four-leaved, permanent; the two opposite leaflets erect; the two smaller ones ovate, obtuse, concave. *Corolla:* one-petalled, subcampanulated; tube shorter than the calix; border quadrifid; divisions upright, obtuse, small; with two opposite smaller divisions, situated in the partition of the corolla. *Stamina:* filamenta four, length of the corolla, upright, awl-shaped, contiguous to the pistil; antheræ sharp-pointed, upright. *Pistil:* germen roundish, minute, superior; style awl-shaped, length of the stamina; stigma simple, obtuse. *Pericarp:* capsule large, roundish, rough, four-celled. *Seeds:* solitary, oblong, compressed. ESSENTIAL CHARACTER. *Calix:* four-leaved, inferior. *Corolla:* subcampanulate, four-cleft, with two minute segments in the divisions of the corolla. *Capsule:* four-celled. *Seeds:* solitary.——The species are,

1. Labatia Sessiliflora. Flowers sessile. The stem is shrubby, six feet or more high; branches alternate, straight, bearing round, upright, rusty, smaller branches; leaves alternate, stalked, two or three inches long, ribbed and veined beneath, shining and silky; flowers whitish, very small; fruit the size of a nutmeg, roundish, rough, and rusty, ripening in December.—Native of Hispaniola.

2. Labatia Guianensis. Flowers peduncled. This is a tree forty feet high or more, and three feet in diameter, with a russet-coloured wrinkled bark; and a whitish, hard, compact wood; flowers small, greenish; fruit oval, hard, rough with rigid short hairs.—Native of Guiana, in the forests by the river Sinemari, flowering and fruiting in November.

Labrador Tea. See *Ledum.*

Laburnum. See *Cytisus.*

Lac, or *Gum Lac.* See *Croton Lucciferum.*

Lace Bark. See *Daphne Lagetto.*

Lachenalia; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* none. *Corolla:* petals six, erected into a tube, oblong, connate at the base, unequal, the three exterior ones shorter, often callous at the tip. *Stamina:* filamenta six, awl-shaped, upright, growing to the base of the petals, and of the same length with them; antheræ oblong. *Pistil:* germen superior, subovate; style awl-shaped, length of the stamina; stigma simple. *Pericarp:* capsule subovate, three-winged, three-celled. *Seeds:* several, globose, affixed to the receptacle. ESSENTIAL CHARACTER. *Corolla:* six-parted; the three outer petals difform. *Capsules:* three-winged; cells many-seeded. *Seeds:* globular, affixed to the receptacle.—The plants of this genus must be preserved, with other Cape bulbs, in a warm border, covered with glasses, or in a dry-stove or glass-case. They will mostly bear forcing, and their flowering may be hastened by keeping them warm in the stove: they are increased by offsets from the bulbs, or by seeds, when they produce any. ——The species are,

1. Lachenalia Orchioides; *Spotted-leaved Lachenalia.* Corollas bell-shaped, the three inner petals longer; flowers sessile; leaves lanceolate, shorter than the scape. Bulb round, whitish. The whole plant smooth; outer petals white, with green tips; inner pale yellow.—Native of the Cape.

2. Lachenalia Pallida; *Pale-flowered Lachenalia.* Corollas bell-shaped, the three inner petals longer; flowers on very short peduncles, horizontal; leaves linear-oblong, longer than the scape. Bulb roundish, flatted a little, the size of a hazel-nut; petals whitish.—Native of the Cape.

3. Lachenalia Contaminata; *Mixed-coloured Lachenalia.* Corollas bell-shaped, the three upper petals longer; flowers peduncled; leaves linear, awl-shaped, channelled; they have dusky red spots scattered over the upper surface.—Native of the Cape.

4. Lachenalia Tricolor; *Three-coloured Lachenalia.* Corollas cylindrical, the three inner petals twice the length of the others, emarginate; flowers peduncled, pendulous. The scape is almost comose with the abundance of awl-shaped bractes that spring out below the upper rudiments of flowers. It varies with yellow, saffron-coloured, blood-red, purple at the tip, and greenish yellow corollas; also in the proportion between the inner and outer petals, and in the breadth of the leaves.—Native of the Cape.

5. Lachenalia Pendula; *Pendulous Lachenalia.* Corollas cylindrical, the three inner petals longer, entire; flowers peduncled, pendulous. Scape upright, round, the thickness of a goose-quill; leaves oblong-lanceolate, succulent, a span long.—Native of the Cape.

6. Lachenalia Viridis; *Green-flowered Lachenalia.* Corollas cylindrical; the three outer petals very long, awl-shaped. Bulb roundish. The whole plant inodorous and smooth; corollas entirely green.—Native of the Cape.

7. Lachenalia Orthopetala. Corollas funnel-form, tubular; the three outer petals a little shorter, bluntish; flowers erect, subpedicelled. Bulb round, whitish; leaves generally four, about a foot long, flaccid; flowers upright, on short pale pedicels, inodorous, about thirty, the upper ones abortive; antheræ purple; germen green.—Native of the Cape.

8. Lachenalia Pustulata. Corollas cylindrical, the three inner petals one-fourth longer than the outer, blunt; flowers erect, subsessile; leaves lanceolate-linear, pustuled. Bulb roundish.—Native of the Cape.

9. Lachenalia Violacea. Corollas cylindrical, three-sided, the three inner petals reflex, a little longer than the outer; flowers pendulous, peduncled; leaves oblong, spotted on the back. Bulb roundish, white, larger than a hazel-nut. The whole of the plant is smooth; flowers small, drooping, smelling like Rue.—Native of the Cape.

10. Lachenalia Patula. Corollas bell-shaped; inner petals spreading or reflex, longer than the outer; flowers erect, peduncled; leaves linear-lanceolate, shorter than the scape, unspotted. Bulb roundish, brown, the size of a pea. The whole plant is smooth; corolla, filamenta, and style, white. —Native of the Cape.

11. Lachenalia Punctata. Corollas tubular, incurved; inner petals a little longer than the outer, the lowest a little shorter than the two others; flowers nodding, peduncled; leaves lanceolate-linear, dotted. Bulb roundish, white; scape ten inches high, shining, with red and pale spots all over it, few-flowered at top; flowers elegant, inodorous; corolla whitish, the outer petals thickly spread, with red dots all over both surfaces.——Native of the Cape.

12. Lachenalia Hirta. Corollas bell-shaped, peduncled; leaves-linear, rough-haired.—Native of the Cape.

Lachnæa; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* periauth one-leafed, permanent; tube long and slender; border four-parted, unequal; the upper segment the smallest, the other three segments reflex, the middle one larger. *Corolla:* none. *Stamina:* filamenta eight, setaceous, upright, nearly the length of the flower; antheræ simple. *Pistil:* germen ovate; style filiform, inserted into the side of the germen, length of the stamina; stigma headed, hispid. *Pericarp:* none; fruit in the bottom of the calix. *Seed:* single, ovate, obliquely acute. *Observe.* This genus differs from *Passerina* only in having an unequal calix. Essential Character. *Calix:* none. *Corolla:* four-cleft, with an unequal border. *Seed:* one, like a berry.——The species are,

1. Lachnæa Eriocephala; *Woolly-headed Lachnæa.* Heads solitary, woolly; leaves imbricate, in four rows, linear, convex. Flowers large, and white, in terminal solitary heads. A green-house plant, flowering all the summer.—Native of the Cape.

2. Lachnæa Purpurea; *Purple-flowered Lachnæa.* Leaves opposite, imbricated, in four rows, obtuse, keeled underneath; segments of the calix smooth. Flowers large, rose-coloured or light purple: the tube of each flower is white, with a woolly tuft at its base.—Gathered at the Cape.

3. Lachnæa Glauca; *Glaucous-leaved Lachnæa.* Leaves scattered, elliptical, glaucous; segments of the calix downy on both sides. Flowers white, fragrant.—Native of the Cape.

4. Lachnæa Conglomerata; *Cluster-headed Lachnæa.* Heads clustered; leaves lax, cylindric, truncate, in four rows. —Native of the Cape.

Lacis; a genus of the class Polyandria, order Digynia.—Generic Character. *Calix* and *Corolla:* none. *Stamina:* filamenta very many (forty) capillary, winged on both sides below, inserted into the receptacle, which is girt with twelve spines; antheræ oblong, bifid at the base, acute, incumbent. *Pistil:* germen oblong, angular, striated; styles two, incurved; stigmas obtuse. *Pericarp:* capsule ovate, eight-streaked, one-celled, bivalve. *Seeds:* very many, very small, affixed to a free ovate receptacle. Essential Character. *Calix* and *Corolla:* none. *Filamenta:* winged on both sides below. *Receptacle:* girt with twelve spines. *Capsule:* ovate, eight-streaked, one-celled, two-valved, many-seeded.——The only known species is,

1. Lacis Fluviatilis. Stems branching, decumbent; branches cylindrical, rough to the touch. The Caribbees call this plant *mourerou.*—It is a native of Guiana, and has been found only on the rocks of the great cascade of the river Sinemari; it is attached to the rocks by packets of small fibres, and, except the flowering branches, is entirely under water.

Lacistema; a genus of the class Monandria, order Digynia. —Generic Character. *Calix:* ament common, imbricated on all sides, columnar; scales one-flowered, ovate, concave; two small linear squamules being placed at the sides beneath the corolla, within the scale. *Corolla:* one-petalled, four-parted; tube none; divisions lanceolate, sharp, suberect; nectary one-leafed, rotate, entire, smaller than the corolla, concave. *Stamina:* filamenta single, situated in the middle of the nectary with the germen, upright, incurved above the middle over the germen, bifid at the top; antheræ minute, roundish. *Pistil:* germen globose; styles two, very short, recurved; stigmas simple. *Pericarp:* berry foot-stalked, obovate, oblong, one-celled. *Seed:* single, oblong. Essential Character. *Calix:* scale of the ament. *Corolla:* four-parted. *Filamenta:* bifid. *Berry:* pedicelled, one-seeded.——The only species yet described is,

1. Lacistema Myricoides. Stem arborescent; branches round, somewhat knotty, ash-coloured, naked, smoothish, spreading, branched; branchlets greenish, leafy, smooth; leaves alternate, ovate, acuminate, smooth, somewhat wrinkled with very minute transverse veins, four inches long; berry black, and soft, the size of a currant, sweet, insipid.—Observed by Rolander in Surinam, and by Swartz in Jamaica.

Lactuca; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common imbricated, cylindric; scales very many, sharp, membranaceous on the margin. *Corolla:* compound imbricated, uniform; corollets hermaphrodite, very many, equal; proper one-petalled, ligulate, truncated, four or five toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* germen subovate; style filiform, length of the stamina; stigmas two, reflex. *Pericarp:* none; calix converging, ovate-cylindric. *Seeds:* solitary, ovate, acuminate, even, compressed. *Down:* capillary, on a long stipe, attenuated below. *Receptacle:* naked. Essential Character. *Calix:* imbricate, cylindrical, with a membranaceous margin. *Receptacle:* naked. *Seeds:* even, with a simple, stipitate down.——The species are,

1. Lactuca Quercina; *Oak-leaved Lettuce.* Leaves runcinate, toothletted, acute, even underneath; stem smooth. Root perennial, fleshy. In its whole habit it approaches nearer to

the wild than the garden Lettuce. The leaves are of a deeper green, and resemble those of the Oak: whence its name.—Native of Sweden and Germany.

2. Lactuca Intybacea; *Endive-leaved Lettuce.* Leaves runcinate, tooth-ciliate, blunt, embracing; stem panicled. The whole plant is smooth and milky; corollets sulphur-coloured.—Native of South America.

3. Lactuca Sativa; *Garden Lettuce.* Leaves rounded; stem-leaves cordate; stem corymbed. Stem strong, round, two feet or three-quarters of a yard in height, bearing abundance of small yellow flowers. This plant has long been celebrated for its cooling and wholesome properties; and as it contains a quantity of milky juice of an opiate nature, it in consequence promotes sleep; and it is also in some degree laxative and aperient, and very proper for hot bilious dispositions. The seeds are of an emollient nature; they unite with water by trituration into an emulsion or milky liquor, which has nothing of the aperient bitterness of the milky juice of the leaves; it is very similar to the emulsion of almonds, but more cooling in its nature, and therefore a better medicine in heat of urine, and other disorders which arise from acrimony and irritation.—The native country of this plant is not known. The Germans call it *gartensalat;* the Dutch, *tuinsalade,* or *latuw;* the French, *la laitue cultivée, ou commune.* Lactuca, a little changed, is the prevailing word in the European languages for Lettuce. The Russians, Danes, and Swedes, call it *laktuk;* the Italians, *lattuga;* the Spaniards, *lechuga;* and the Portuguese, *leituga.* The several varieties cultivated for use in kitchen-gardens, are, 1. Common, or Garden Lettuce; 2. Cabbage Lettuce; 3. Cilicia; 4. Dutch Brown; 5. Aleppo; 6. Imperial; 7. Green Capuchin; 8. Versailles, or Upright White Cos; 9. Black Cos; 10. Red Capuchin; 11. Roman; 12. Prince; 13. Royal; 14. Egyptian Cos.—*Propagation and Culture.* The common Lettuce is sown for cutting very young, to mix with other salad herbs, and is only different from the Cabbage Lettuce in being a degeneracy therefrom; or rather the Cabbage Lettuce is an improvement by frequent cultivation upon the Common Lettuce; for if the seeds be saved from such plants of the former as did not cabbage closely, the plants produced from that seed will degenerate to the first sort, which is by the gardeners called Lapped-Lettuce, to distinguish it from the other, which they call Cabbage-Lettuce. The seeds of the Common Lettuce, which are usually saved from any of the plants without regard to their goodness, are generally sold at a very cheap rate, especially in dry seasons, when they always seed in the greatest abundance; and is sometimes sold for Cabbage Lettuce, so that the buyer is disappointed in his crop. This sort therefore should never be cultivated but to be cut up very young, being the only kind fit for that purpose. It may be sown at any time of the year, observing only to sow it in shady borders during hot weather, and in the spring and autumn, upon warm borders; but in winter it should be sown under glasses, otherwise it is subject to be destroyed by severe frosts. The Cabbage Lettuce may also be sown at different times of the year, in order to have a continuation of it through the whole season. The first crop is generally sown in February, upon a warm spot of ground; and when the plants are come up, they should be thinned out to the distance of ten inches each way, which may be done by hoeing them out, as is practised for Turnips, Carrots, Onions, &c. provided you have no occasion for the superfluous plants; otherwise they may be drawn up, and transplanted into another spot of ground at the same distance, which, if done before the plants are too large, they will succeed very well, though they will not be so large as those which are left upon the spot where they are sown, but they will come somewhat later, which will be of service where people do not continue sowing every fortnight or three weeks in summer. You must also observe, in sowing the succeeding crops, as the season advances, to choose a shady moist situation, but not under the drip of trees, which would cause them to run up into seed in summer before they cabbage. In the beginning of August, sow the seeds for the last crop, which is to stand over winter, thinly upon a good light soil, in a warm situation; and when the plants are come up, they must be hoed out, that they may stand singly. Remove all the weeds, and in the beginning of October transplant them into warm borders, where, if the winter is not severe, they will stand very well; but in order to be sure of a crop, it will be advisable to plant a few upon a bed pretty close together, where they may be arched over with hoops, and in severe frosts covered with mats, straw, or pease-haulm, to secure them from being destroyed. In the spring of the year they may be transplanted out into a warm rich soil, ten inches asunder; but still those that grew under the wall, if they escaped the winter, and were suffered to remain, will cabbage sooner than those which are removed again; but you must observe not to place them too close to the wall, which would occasion their growing up tall, and prevent their being large or hard. In order to save good seeds of this kind, look over your Lettuces while in perfection, and mark such as are very hard and grow low, by placing sticks in the ground close to them. Pull up all that you do not want for seed, as soon as they begin to run up, lest, when they come to flower, the farina of the bad should mix with the good, and so degenerate the seeds, which should always be saved either from those which stood through the winter, or those which were sown early in the spring, for the later ones very seldom perfect their seeds. The Cilicia, Imperial, Royal, Black, White, and Upright Cos Lettuces, may be sown first at the latter end of February, or the beginning of March, upon a moderate hot-bed, or on a warm light soil, in a sheltered situation; and when the plants are come up, and are fit to transplant, those which are sown on the hot-bed should be transplanted on another warm bed about four inches asunder row from row, and two inches' distance in the rows, shading them from the sun until they have taken new root; after which, they should have a larger share of air daily, to prevent their drawing up weak; but in favourable seasons, transplant them at the beginning of April, where they are to remain, placing them sixteen inches apart each way, because the large sorts must not be placed near each other; those sown in the full ground will be later before they come up, and should be either hoed out, or transplanted into another spot of ground, especially if the soil be good. After they have taken fresh root, weed them carefully, which is all the culture they will require, except the Black Cos Lettuce, which should be tied up when they are full grown, in the manner as directed for blanching of Endive, (See *Cichorium Endivia,*) to whiten their inner leaves, and render them crisp, otherwise they are seldom good for much, rarely cabbaging without this assistance. When they are in perfection, mark those you intend for seed, as already directed for the Common Cabbage Lettuce, and take away the rest, for the reasons above given. These sorts may also be continued throughout the Lettuce season, by sowing them in April, May, and June, observing to sow the late crops in a shady situation, otherwise they will run up to seed before they grow to any size; but in the middle of September you may sow of these sorts to abide the winter; which plants should be transplanted either under glasses, or into a bed, which should be arched over with hoops, in order to be covered in

the winter, without which covering the plants would often be destroyed; but letting them have as much air as possible in mild weather. In the spring, these plants should be planted out into a rich light soil, allowing them at least sixteen inches' distance each way; for if they are planted too close, they are very subject to grow tall, but seldom cabbage well. From the crop, if they succeed well, it will be proper to save your seeds; though you should also save from that crop sown on the hot-bed in the spring, because sometimes it happens, that the first may fail by a wet season, when the plants are full in flower, and the second crop may succeed, by having a more favourable season afterwards.—The most valuable of all the sorts of Lettuce in England, are the Egyptian Green Cos, the Versailles or White Cos, and the Cilicia; though some people are very fond of the Royal and Imperial Lettuces, which seldom sell so well, or are so much esteemed, as the other; the White Cos obtained the preference, until the Egyptian Green Cos was introduced, which is so much sweeter and tenderer than the White Cos, that all good judges pronounce it the best sort of Lettuce yet known; it will endure the cold of our ordinary winters as well as the White Cos; but at the season of its cabbaging, if there happen to be much wet, it is very subject to rot. The Brown, Dutch, and Green Capuchin Lettuces, are very hardy, and may be sown at the same season as was directed for the Common Cabbage Lettuce, and are very proper to plant under a wall or hedge, to stand the winter, where many times these will abide when most of the other sorts are destroyed, and therefore they will prove very acceptable at a time when few other sorts are to be had: they will also endure more heat and drought than most other sorts of Lettuce, which renders them very proper for late sowing; for it often happens, in very hot weather, that the other sorts of Lettuce will run up to seed in a few days after they are cabbaged, whereas these will abide nearly a fortnight in good order, especially if care be taken to cut the forwardest first, leaving those that are not so hard cabbaged to the last. If some plants of these two last sorts are planted under frames, on a moderate hot-bed in October, they will be fit for use in April, which will prove acceptable to those who are lovers of Lettuce; and being covered by glasses, will render them tender. In saving these seeds, the same care should be taken to preserve only such as are very large and well cabbaged, otherwise the seeds will degenerate, and be good for little.—The Red Capuchin, Roman, and Prince's Lettuces, are pretty varieties, and cabbage very early, for which reason a few of them may be preserved, as may also some of the Aleppo, for the beauty of its spotted leaves; though very few people care for any of these sorts at table, when the other more valuable ones are to be obtained; but the former do very well in a scarcity of the latter, and are very proper for soups. The seeds of these must also be saved from such as cabbage best, otherwise they will degenerate, and be good for little. In saving seeds of all these sorts of Lettuce, never suffer two sorts to stand near each other, for, by their farina mixing, they will both vary from their original, and partake of each other; and there should be a stake fixed down by the side of each, to which the stem should be fastened, to prevent their being broken, or blown out of the ground by wind, to which the Cilicia, Cos, and the other large-growing Lettuces, are very subject when they are in flower. Observe also to cut such branches of the large-growing Lettuce as ripen first, and not wait to have the seed of the whole plant ripe together, which never happens; but, on the contrary, some branches will be ripe a fortnight or three weeks before others; and when you cut them, they must be spread upon a coarse cloth in a dry place, that the seeds may dry, after which you should beat them out, and dry them again, and then preserve them for use, taking care to hang them up where mice and other vermin cannot come at them, for if they do they will soon eat them up.—The wild sorts are easily raised from seed: Perennial Lettuce spreads at the root; it is increased by suckers.

4. Lactuca Scariola; *Prickly Lettuce.* Leaves vertical, prickly on the keel. Root biennial, and, like the rest of the plant, very full of milky juice; stem erect, two or three feet high, round, prickly, leafy, branched at the top into a sort of panicle, consisting of numerous small pale yellow flowers; seeds ovate, of a ferruginous blackish colour.—Native of the southern parts of Europe; found wild with us on the borders of fields in the Isle of Ely.

5. Lactuca Virosa; *Strong-scented Lettuce.* Leaves horizontal, prickly on the keel, and toothed. Root biennial; stem from two to four feet high, prickly below; flowers numerous, yellow, sessile, or on short peduncles, with a small leaf at the base of each, and others still smaller on them.—Native of the south of Europe, in hedges, on ditch-banks, and borders of fields. In England, at the World's End near Stepney, and on the banks of the Thames between Blackwall and Woolwich; found also at Burwell Pit, in Cambridgeshire; on old walls near Bungay in Suffolk; in Marston Lane, Oxfordshire; and in a stone quarry at Thorp Arch, in Yorkshire. This plant abounds with a milky juice, the opiate power of which is of very considerable strength, insomuch that it may occasionally be used in the manner of common opium. It may be collected by suffering the juice to drain from the wounded parts of the plant; and then, by drying in the manner of opium, it may be made into pills. Sir John Hill, in his *British Herbal*, recommends this to be practised in April and May. When dried, it dissolves freely in wine, and forms an excellent anodyne; the dose of which, a tea-spoonful in a glass of water answers all the purposes of laudanum. Dr. Collins relates twenty-four cases of dropsy, out of which twenty-three were cured by taking the extract, in doses from eighteen grains to three drachms in twenty-four hours; it commonly proves laxative, promotes urine and gentle sweats, and removes thirst: it must be prepared when the plant is in flower. A syrup, made from a strong infusion of the plant, is also an excellent anodyne medicine; it eases the most violent pains of the colic and other disorders, and gently disposes the patient to sleep, producing all the good effects of a gentle opiate.

6. Lactuca Saligna; *Least Lettuce.* Leaves hastate-linear, sessile, prickly on the keel. Flowers nearly sessile, small, yellow.—Native of France, Saxony, Silesia, Switzerland, Austria, Carniola, Piedmont, and England, on the banks of ditches, and in pastures on a chalky soil.

7. Lactuca Tuberosa; *Tuberous-rooted Lettuce.* Leaves spinulous-toothed; stem almost simple; root tuberous, manifold. The whole plant, and even the calix, abounds with a white milk, which turns to an orange-colour when exposed to the air; corollas pale blue, purple; flowers few.

8. Lactuca Canadensis; *Canadian Lettuce.* Leaves lanceolate-ensiform, embracing, toothed, unarmed.—Native of Canada.

9. Lactuca Indica; *Indian Lettuce.* Leaves lanceolate, ensiform, sessile, unequally toothed.—Native of the East Indies; and observed in Java.

10. Lactuca Perennis; *Perennial Lettuce.* Leaves linear, tooth-pinnate; segments toothed upwards. Root perennial, composed of many long fleshy fibres, which abound with a

milky juice, and spread pretty far in the ground; flowers terminating on slender branching peduncles, sustaining from two to four flowers; corollas deep blue, or purple.—Native of Germany, Italy, and France.

11. Lactuca Angustana. Leaves entire, toothed, sharply hooked; the midrib smooth. Root annual, fusiform; stem the height of a man; flowers on short peduncles, and panicled; florets commonly twelve; seed dirty white. The whole plant is very smooth and milky, without any virose smell. —It is found in sandy places, by the torrent that descends from the Great St. Bernard, and in the valley of Aost, between St. Pierre and Villanova.

12. Lactuca Elongata. Leaves smooth underneath; lower leaves runcinate, very entire, embracing the stem; radical leaves dentated, those on the top of the plant lanceolate; flowers corymbose, paniculate. It grows from three to six feet high, and the flowers are small, and of a pale yellow colour.—Found in woods on road sides, in fertile soils, from Carolina to Canada.

13. Lactuca Graminifolia. Stalk erect, simple; panicles aphyllous, lax; branches rariflorous; all the flowers pedunculated.—Found by Michaux in Lower Carolina.

Ladies' Bedstraw. See *Galium.*

Ladies' Bower. See *Clematis.*

Ladies' Mantle. See *Alchemilla.*

Ladies' Slipper. See *Cypripedium.*

Ladies' Smock. See *Cardamine.*

Ladies' Traces. See *Ophrys.*

Laetia; a genus of the class Polyandria, order Monogynia. —Generic Character. *Calix:* perianth five-leaved; leaflets oblong, concave, reflex, coloured, withering. *Corolla:* none, or else five petals. *Stamina:* filamenta numerous, capillary, rather shorter than the calix; antheræ roundish. *Pistil:* germen oblong, ending in a filiform style, longer than the stamina; stigma headed, depressed. *Pericarp:* berry globose, three-sided, furrowed with three lines, one-celled, increased internally by a cartilaginous membrane. *Seeds:* very many, nestling, cornered, coated with a pulpy aril. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled, or none. *Fruit:* one-celled, three-cornered. *Seeds:* with a pulpy aril.——The species are,

1. Laetia Apetala. Flowers apetalous; calices five-leaved, reflex; leaves oval, serrulate, smooth on both sides. This is an upright tree, about twenty feet in height, putting out spreading branches from the very ground. Common peduncles three-flowered, axillary, sustaining white flowers like those of Hawthorn in appearance, size, and smell; they appear in April and May, and fruit in August.—Native of Carthagena, in New Spain.

2. Laetia Completa. Flowers petaloid, complete. This is a small branching tree, about nine feet high. Common peduncles axillary, tomentose; fruit reddish-yellow, often obscurely triangular.—Native of Carthagena, flowering in June, and fruiting in August and September.

3. Laetia Guidonia. Flowers apetalous; peduncles one-flowered, terminating; leaves oblong, acuminate, serrate, pubescent. This tree grows to a considerable size, is esteemed a fine timber wood, and much used in all sorts of buildings. The filamenta of the flower are very numerous; and in the fruit the lines between the valves are of a beautiful red colour, as well as the placentæ.—Native of Jamaica; where it is called Rodwood.

4. Laetia Thamnia. Flowers apetalous; peduncles many-flowered, subdivided, axillary; leaves oblong, acute, subcrenate, shining.—This shrub is found in the red hills above the Angels, in Jamaica, but is not common.

Lagerstroemia; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, six-cleft, bell-shaped, rather acute, smooth, permanent. *Corolla:* petals six, ovate, obtuse, cusped, undulated, contorted; claws filiform, longer than the calix, inserted into the receptacle. *Stamina:* filamenta very many, filiform, longer than the calix, inserted into the calix below the germen, the six interior ones are twice the thickness of the rest, and are longer than the petals; antheræ oval, incumbent. *Pistil:* germen subglobose; style filiform, length of the longer stamina; stigma simple. *Pericarp:* capsule subglobose, crowned with the style on its bluntish top, six-furrowed, six-celled, six-valved; the dissepiments coalescing with the sutures. *Seed:* several, ovate, awl-shaped at the base, compressed, adhering to a central hexagonal pillar. *Observe.* The number of parts sometimes varies. Essential Character. *Calix:* six-cleft, bell-shaped. *Petals:* six, curled. *Stamina:* very many, the six outer thicker than the rest, and longer than the petals.——The species are,

1. Lagerstroemia Indica. Leaves alternate, ovate; calices naked, even. The trunk of this tree is about a fathom high, and smooth all over. Flowers in a decompound, trichotomous, naked, spreading panicle at the ends of the twigs; corolla purple.—Native of the East Indies, China, Cochinchina, and Japan.

2. Lagerstroemia Speciosa. Leaves alternate, ovate; calices and leaves tomentose underneath.—Native of China.

3. Lagerstroemia Reginæ. Leaves opposite, oblong, smooth; calices grooved. Trunk erect; branches horizontal, spreading; flowers much larger and more beautiful than those of the first species, colour in the morning that of a pale rose, growing deeper through the day, and acquiring a purple tinge; calix inferior, on the outside beautifully grooved into trapezoid figures.—Native of the East Indies, on many woody mountains of the northern parts of the Circars, where it grows to a tree of a middling size, flowering in the hot season, and ripening seeds in August. It is very beautiful when in flower, and well deserves a conspicuous place in our stoves.

4. Lagerstroemia Parviflora. Leaves opposite, oblong, smooth above, downy underneath; calices grooved. Trunk erect, with smooth ash-coloured bark; branches numerous; flowers small, white, less than the common Myrtle.—This small tree is a native of the Circar mountains; it flowers during the hot season, and the seeds are ripe in August and September. The wood is used by the natives for various œconomical purposes, but neither the beauty of the flower, nor the appearance of the tree, recommend it for ornament on a footing with the other species.

Lagœcia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* involucre universal eight-leaved; leaflets feather-toothed; ciliated, reflex, containing the umbellule; involucre proper four-leaved; leaflets hair-feathered, involving a single footstalk, shorter than the leaflet itself; perianth proper five-leaved; hair many-cleft, superior. *Corolla:* petals five, two-horned, shorter than the calix. *Stamina:* filamenta five, capillary, length of the corolla; antheræ roundish. *Pistil:* germen roundish, below the receptacle of the perianth; style length of the stamina; stigmas two, the one truncated. *Pericarp:* none. *Seeds:* solitary, ovate-oblong, crowned by the perianth. *Observe.* The alternate seed is abortive. Essential Character. *Involucre:* both universal and partial, pinnatifid. *Perianth:* of five leaves, in many capillary segments. *Petals:* bifid. *Seeds:* solitary, inferior.——The only known species is,

1. Lagœcia Cuminoides; *Wild* or *Bastard Cumin.* This is an annual plant, about a foot high, with leaves resembling

those of Honeywort. The flowers which appear in June and July, are collected into spherical heads at the extremity of the stalks, and are of a greenish-yellow colour.—Native of the Levant. Sow the seeds in autumn on a warm border soon after they are ripe; or if they be permitted to scatter, they will soon come up of themselves. When the seeds are sown in the spring, they commonly remain in the ground a year, and sometimes two or three, before they grow.

Lagunæa; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, somewhat cornered, half five-cleft, permanent (according to Cavanilles, deciduous.) *Corolla:* petals five, ovate-oblong, obtuse, spreading, affixed to the base of the tube of the stamina. *Stamina:* filamenta several, (from twenty-five to thirty,) conjoined into a tube below, in the top and sides of the tube receding from it and free; antheræ roundish. *Pistil:* germen ovate-oblong; style thread-shaped, longer than the stamina, five-cleft at the tip: divisions spreading, or undivided; stigmas headed. *Pericarp:* capsule ovate-oblong, somewhat five-cornered, five-celled, five-valved; partitions contrary. *Seeds:* some, roundish, three-sided. Essential Character. *Calix:* simple, five-cusped. *Style:* simple. *Stigma:* peltated. *Capsule:* five-celled, five-valved.—Plants of this genus may be propagated and cultivated in the same manner with those species of *Hibiscus* which come from hot countries; which see.——The species are,

1. Lagunæa Aculeata; *Prickly Lagunæa.* Stem prickly, tomentose; leaves deeply many-parted; flowers axillary, solitary. Flowers on short peduncles; corolla yellow, twice as long as the calix, spreading.—Native of Coromandel, near Pondicherry, where it is called *cattucacheree* by the natives.

2. Lagunæa Solandra; *Maple-leaved Lagunæa.* Leaves subcordate, three-cusped, serrate; flowers corymbed. This plant is about two feet high, and hirsute; stem upright, round, stiff, the thickness of a goose-quill; flowers corymb-racemed at the ends of the stem and branches; corolla purplish white.—Found in the Isle of Bourbon. See *Hibiscus Solandra*, which is the same plant. It ripens seed in England, and may be increased by them.

3. Lagunæa Ternata; *Three-leaved Lagunæa.* Stem herbaceous, villose; lower leaves ternate, with the middle leaflet very long; upper leaves subhastate; flowers axillary, solitary. Root round, not very fibrous.—Native of Senegal.

Lagurus; (Hare's-tail Grass) a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume one-flowered, bivalve; valves long, linear, spreading, very thin, each ending in a villose awn. *Corolla:* bivalve, thicker than the calix; valve exterior, longer, terminated by two small upright awns; a third awn from the middle of the back of the same valve, reflex-twisted; valve interior, small, sharp; nectary two-leaved; leaflets lanceolate, obtuse, gibbous at the base. *Stamina:* filamenta three, capillary; antheræ oblong. *Pistil:* germen top-shaped; styles two, setaceous, villose; stigmas simple. *Pericarp:* none. *Corolla:* grows to the seed. *Seed:* solitary, oblong, covered, awned. Essential Character. *Calix:* two-valved, with a villose awn. *Corolla:* having on the outer petal two terminating awns, and a third dorsal one, twisted back.——The only species is,

1. Lagurus Ovatus. This is an annual grass, growing to the height of a foot or eighteen inches, and even more, very soft and hoary, as are also the leaves and spikes.—Native of the south of Europe, France, Italy, Sicily, and Portugal.

Lamb's Lettuce. See *Valeriana.*

Lambertia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* involucre of many long, imbricated, coloured leaves, the inner ones gradually the largest, containing from one to seven flowers, deciduous; perianth none. *Corolla:* petals four, cohering at the base, linear-lanceolate, equal, revolute from above their point of union, bearing the stamina; nectary of four glandular scales at the base of the germen, sometimes united. *Stamina:* filamenta none; antheræ four, sessile at the inner side of the revolute part of each petal, linear, at length recurved. *Pistil:* germen superior, turbinate, fringed at the top; style thread-shaped; stigma rather thicker, prominent, awl-shaped, furrowed. *Pericarp:* follicle roundish-wedge-shaped, somewhat woody, more or less horned or tubercular, of one cell. *Seeds:* two, orbicular, compressed, each encompassed with a rounded ring; common receptacle flat, without scales. Essential Character. *Petals:* four, cohering, spirally revolute, bearing the stamina. *Nectary:* of four scales. *Stigma:* awl-shaped. *Follicle:* woody. *Seeds:* two, bordered. *Involucre:* of many leaves, imbricated, coloured, deciduous. *Receptacle:* flat.——The species are,

1. Lambertia Uniflora. Flowers solitary in each involucre. Leaves obovate, with a point, smooth, reticulated. Follicle pointed at one side, without horns. Gathered by Mr. Brown in Lewin's Land, on the south coast of New Holland, growing about rocky inlets near the shore.

2. Lambertia Inermis. Flowers seven in each involucrum; twice as long as its inner leaves; styles smooth; follicles pointed at one side, without horns; leaves oblanceolate or obovate, pointless.—Native of stony hills in Lewin's Land.

3. Lambertia Formosa. Flowers seven, in each involucre, the length of its inner leaves; style hairy; follicle pointed at one side, two-horned at the other; leaves linear-lanceolate, sharp-pointed, recurved at the edges. Involucre and flowers of a fine rose-colour or crimson. The leaves are green and smooth above; white, and reticulated with veins beneath.—Native of stony heaths near Port Jackson.

4. Lambertia Echinata. Leaves linear, smooth, reticulated; dilated, lobed, and pointed at their extremities; follicles two-horned, thorny all over.—Native of stony sides of hills in Lewin's Land. Not being seen in flower, its genus remains doubtful.

Lamium; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, wider above, five-toothed, awned, nearly equal, permanent. *Corolla:* one-petalled, ringent; tube cylindric, very short; border gaping; throat inflated, compressed, gibbous, marked on each edge with a reflex toothlet; upper lip arched, roundish, obtuse, entire; lower lip shorter, obcordate, emarginate, reflex. *Stamina:* filamenta four, awl-shaped, covered beneath the upper lip, two of them longer; antheræ oblong, hairy. *Pistil:* germen four-cleft; style filiform, length and situation of the stamina; stigma two-cleft, sharp. *Pericarp:* none. *Calix:* open, and bearing in its bosom the seeds, which are flat at top. *Seeds:* four, short, three-sided, convex on one side, truncated on both sides. Essential Character. *Corolla:* upper lip entire, vaulted; lower two-lobed; throat with a reflex toothlet on each side.——The species are,

1. Lamium Orvala; *Baum-leaved Archangel.* Leaves cordate, unequally and sharply serrate; corollas inflated at the throat; calix coloured. Root perennial; stem from half a yard to nearly a yard high; corolla an inch long, of a deep red colour. The brilliance and size of the flowers have secured it admittance into the garden, while all the rest are excluded, notwithstanding its strong and unpleasant smell. The Orvala Garganica of Linneus is a mere variety of this, owing its apparent difference to having grown in a moist shady place.—Native of Italy, Silesia, and Hungary. It

rarely produces good seeds in England, nor do the roots propagate very fast. October is the best time to part and remove these roots, but they must not be transplanted oftener than every third year, if they are required to flower strongly. It is hardy, and thrives best in a soft loamy soil. Mr. Curtis says it grows readily; but that, flowering about the end of April, it is then apt to be injured if cold winds prevail, unless it be placed in a sheltered part of the garden.

2. Lamium Lævigatum; *Smooth Archangel.* Leaves cordate, wrinkled; stem even; calices smooth, the length of the tube of the corolla. Root perennial, somewhat creeping; whorls of flowers separated by leaves, ten in a whorl at most. —Native of Italy, Silesia, and Siberia.

3. Lamium Rugosum; *Wrinkled Archangel.* Leaves cordate, acute, wrinkled, hairy with the stem; whorls many-flowered; a single bristle-shaped tooth at the throat. This plant is about a foot high. The flowers are like those of the common sort, and of a deep rose-colour. Sometimes in cold situations it produces curled leaves, round like those of the Lime-tree.—Native of Italy.

4. Lamium Garganicum; *Woolly Archangel.* Leaves cordate, pubescent; throat of the corolla inflated; tube straight, a double tooth on each side. Root perennial, creeping; stems many, thick, a foot high; flowers in whorls from the upper joints, large, of a pale purplish colour, continuing in succession most part of the summer.—Native of Italy, Silesia, China, Cochin-china, and Japan. It is propagated by seeds, and its roots spread very fast.

5. Lamium Maculatum; *Spotted Archangel.* Leaves cordate, acuminate; whorls ten-flowered. This is very nearly allied to the next sort; but differs from it in having a purple corolla; the leaves marked with a longitudinal white area, which however disappears in summer; the petioles not widened; flowers five on each side, not ten; two teeth on each side of the throat, the upper one bristle-shaped. -Native of Germany, Silesia, Dauphiny, and Italy.

6. Lamium Album; *White Archangel*, or *Dead Nettle.* Leaves cordate, acuminate, serrate, petioled; whorls twenty-flowered. Root perennial, white, jointed, creeping; stems numerous, a foot high, unbranched, slender at bottom, hollow, slightly hairy, sometimes almost smooth; in exposed situations reddish purple; the young shoots erect and ascending. Flowers yellowish-white, sometimes tinged with red. It is common in hedges, on banks, by road-sides, and in corn-fields, flowering in April and May, when it is much resorted to by bees, for the honey secreted in the bottom of the tube by the gland that surrounds the base of the germen. Hence it is called in some countries *Bee-nettle*, which is corrupted into *Bean-nettle.* It has also the name of *Dienettle*, which is a corruption of *Dead-nettle*, and that, as well as *Blind-nettle*, means a nettle without stings.—This plant has a disagreeable smell when bruised. The Phalæna Chrysitis, or burnished brass moth, feeds on it. Linneus says, the leaves are eaten in Sweden as a pot-herb in the spring. No cattle however appear to touch it; and having a strong creeping perennial root, it should be extirpated, unless retained for medical purposes. The flowers made into a conserve are an excellent remedy for that troublesome, weakening, and oftentimes obstinate and dangerous, female complaint, the fluor albus or whites; doses of a few grains, gradually increased, have been found very effectual. The whole plant is of an astringent nature; and the dried roots are sometimes given with success in fluxes. A strong infusion of the leaves bids fair to answer the same purposes, and may be serviceable in all other kinds of weakness and debility.—It propagates itself copiously by the roots.

7. Lamium Bifidum. Leaves cordate, acuminate; upper lip of the corolla bifid; segments divaricated. Stems a foot or eighteen inches high, procumbent, tinged with red at bottom, and branched there; flowers white, appearing in February and March.—It is an annual plant, native of Italy, near Naples; the coast of Tuscany, and the isle of Elba.

8. Lamium Purpureum; *Purple Archangel.* Leaves cordate, blunt, petioled. Root annual, fibrous; stems several, at the bottom weak and branched, near the top almost naked, and frequently coloured, six inches or more in height, hollow, and somewhat rugged; flowers growing thickly together on the tops of the stalks in whorls, six together, in a double row; corolla red; seeds pale brown, triangular, truncate, margined.—This, like the sixth species, is common in most parts of Europe, in the same situations, and is a common weed in gardens and other cultivated land; flowering a great part of the year, from April to September, and in mild seasons both earlier and later. Bees resort also to this for the honey-juice in the flowers. Linneus says it is boiled in Upland, a province of Sweden, as a pot-herb. The herb and flowers, either fresh or dried, afford a decoction that is good for floodings, bleedings at the nose, spitting of blood, or any kind of hæmorrhage. The leaves are also useful to stanch wounds, when bruised, and outwardly applied. It is propagated by seeds.

9. Lamium Dissectum; *Cut-leaved Archangel.* Leaves deeply and irregularly cut; stem-leaves decurrent. It is annual, and not unfrequent, according to Ray, in kitchen-gardens and fallow fields. Mr. Curtis observed it on a bank between Pimlico and Chelsea; and Mr. Robson, about Darlington.

10. Lamium Molle; *Pellitory-leaved Archangel.* Leaves petioled, slightly toothed, lower cordate, upper ovate; flowers white.—Native place unknown.

11. Lamium Amplexicaule; *Perfoliate Archangel.* Floral leaves sessile, embracing, blunt; root annual, fibrous, whitish; stems several, nine inches or a foot high, nearly upright, smooth, with a few opposite branches; flowers in whorls, to fifteen, perfect and imperfect; the latter short, a little longer than the calix, the tips very red, hairy, and closed; the former four times the length of the calix, bright purple, generally breaking out from the top of the stem. The imperfect corollas are very hairy, of a bright red colour, and have the mouth closed. The tube of the perfect ones is very long, cylindrical, and nearly upright; the edge of the throat is turned back, spotted, and has two little teeth; the neck is a little prominent; the upper lip hirsute, and nearly entire; the lower turning down, and dividing into two lobes, which are spotted with purple. The imperfect flowers appear in February and March, the perfect ones not till May or June: if the progress of the flowers be watched, it will be found that the corolla is gradually enlarged in different flowers, till the weather being sufficiently warm, they come forth fully formed. The imperfect flowers are neither rudiments of the long ones, nor are they barren, for they have both stamina and pistillum. Linneus informs us that this plant scarcely ever produces perfect flowers in Sweden. Here then we have a process somewhat similar to what is observed in the Violet, and some other plants, in which perfect seed is produced, although the corolla be not perfectly formed; analogical to what happens in the animal kingdom, when a caterpillar, previously to its changing into the chrysalis state, has been deprived of its proper quantity of food, the fly comes forth perfect in all its parts except the wings, which are crumpled up, and never expand.—This plant is common in most parts of Europe, in cultivated ground, on light soils, and on walls. The old name of it is *Great Henbit.*

12. Lamium Multifidum. Leaves many-parted.—Native of the Levant.

13. Lamium Moschatum; *Musky Archangel.* Leaves cordate, blunt, smooth; floral-leaves sessile; calices deeply gashed. Flowers white, appearing in April. The leaves are marked with white, somewhat like those of the autumnal Cyclamen; they are smooth, and in dry weather have a musky scent, but in wet weather are fetid.

14. Lamium Hispidulum. Stalk hispid; leaves widely cordate, pubescent; axils one-flowered; flowers large, white.—Found in the shady woods of Tennassee, North America.

Lanaria; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* one-petalled, subcampanulated, outwardly wool-haired; tube short; border six-parted; divisions linear-lanceolate, somewhat spreading. *Stamina:* filamenta six, filiform, shorter than the corolla, inserted into the base of the divisions; antheræ ovate, somewhat incumbent. *Pistil:* germen inferior, top-shaped, outwardly woolly; style filiform, upright, length of the stamina; stigmas three-cleft. *Pericarp:* capsule ovate, three-celled. *Seeds:* few. Essential Character. *Corolla:* superior, woolly, longer than the filamenta; border six-parted, somewhat spreading. *Capsule:* three-celled.——The only known species is,

1. Lanaria Plumosa. Root fibrous; stem woolly, upright; stem-leaves sessile, nerved, smooth; flowers terminating, in a close panicle; spathes simple. It has the habit of Wachendorfia.—Native of the Cape.

Land.—It is stated, in an able work on the landed property of England, that land, viewed in the light of agriculture, is the foundation on which it rests, the materials on which it operates, and the visible source of its productions. And that it may generally be considered as being composed of three distinct parts; the soil, the subsoil, and the base, or substructure, on which they rest. It is added, that the soil, or plant-feeding stratum, is equally various in quality and depth. The soils of cultivated lands, however, have their limits as to depth. These limits may, it is conceived, be fixed at three and fifteen inches. For although in many instances the component parts of land are pretty uniform to a greater depth than fifteen inches, a uniformity of colour and vegetative quality seldom reaches to that depth. The influence of the atmosphere, the fibres of vegetables living and decayed, the operations of animalcula and larger animals, that inhabit soils, and, above all, the powerful effects of manures, tend to furnish the surface-mould with qualities which the substrata have not the means of acquiring. The medium depth of cultivated soils in England may, we suppose, be set down at about nine inches. For although a majority of the cultivated soils of the kingdom may not reach that depth, the writer is of opinion that the major part might be advantageously sunk to that depth. The subsoil, or intervening stratum of land, is still less definite with regard to depth. In some instances, as where the cultivated soil rests upon rocks, it may be said to be wanting, though, in most cases of this kind, a stratum of a gravelly nature, composed of broken rock and earth, is found between them. In many cases a regular bed of gravel, sand, or other earth, intervenes between the soil and the substructure; while in others a uniform mass of earthy materials reaches to a great depth. If therefore a definite thickness or depth may be assigned to the subsoil, it must be in a degree arbitrary, or without any degree of accuracy or correctness. It seems evident that the soil affords nourishment and stability to agricultural plants, and that the subsoil assigns them temperature, with respect to moisture and internal warmth. If the subsoil be of such a nature, or so situated, as to receive and retain more moisture than is requisite for the natural growth of plants, their health is injured. If it not only holds water in its own pores, but freely communicates it to those of the soil, the more valuable plants in agriculture will give way to ranker herbage, let the surface soil be what it may. On the contrary, if an open stratum of sufficient depth intervenes between the cultivated soil and the base, to permit the superfluous moisture which filters through the soil to pass off, the plants in cultivation will be relieved from collected moisture in the immediate region of their feeding fibres, though the substructure may be charged to the full with water. Hence, where nature has not furnished land with this valuable interstratum, it is the business of art to remedy the defect; which is generally best done by draining off the superfluous moisture to a sufficient depth to prevent its evil effects on the soil, and thereby supplying the required stratum. In doing this, the artist must be led by the given properties of the base, and he can seldom lower it to any determinate or arbitrary depth. Nevertheless, he should endeavour to form an adequate idea of the medium depth required; in doing which, much depends on the specific quality of the soil. Sand will hold up water that is lodged at its base to a much greater height than gravel; a stratum of which, one foot deep, forms a drier subsoil than a bed of sand of twice or three times that thickness. But clean sand or gravel is rarely found in land, sand and gravelly loams being the most common in absorbent subsoils; and these are capable of raising and holding up water to a considerable height. Let us therefore admit that effective subsoils may vary from one to two feet, and fix the medium depth at eighteen inches; by thus placing the mean depth of soils at nine inches, and that of subsoils at eighteen inches, we shall place the base or substructure of the land at twenty-seven inches beneath its surface; which is a depth of land equally conformable with theory and with practice. To this depth drains may be sunk at a moderate expense; especially covered stone drains, which would be effectual, and yet not be liable to injury in tillage. In the practice of skilful workmen, the depth of ordinary subsoil drains varies from eighteen inches to three feet, according to the circumstances of the given case, and the method of draining employed. After this general view of the component parts of land, and of their due arrangement, the common varieties of it, as they are given by soil, subsoil, and base, remain to be considered. We shall divide them into classes, and mark the varieties of each.—*First Class.* This comprehends such lands as are liable to surface-water only, with their absorbent strata (if any) open, so as freely to discharge the superfluous water that falls upon them. The varieties of this are, first, where the soil, the subsoil, and the base, are repellent, or in a state of moistness impenetrable by water; as clay and strong deep clayey loam. The second, where the soil is repellent, the subsoil absorbent, and the base repellent. The third, where the soil is repellent, the subsoil and base absorbent, or in a state of moistness conducting water; as sand, gravel, open rock, and the lighter more open loams. The fourth, where the soil, the subsoil, and the base, are absorbent. The fifth, where the soil and the subsoil are absorbent, but the base repellent. And the sixth, where the soil is absorbent, the subsoil repellent, and the base absorbent or repellent.—*Second Class.* This includes such lands as are liable to surface-water only, with their absorbent strata closed, or permitting an imperfect discharge, either for want of sufficient descent, or by reason of impervious strata, or beds of impenetrable materials. The varieties of which are, first, where the soil is repellent, the subsoil absorbent, and the base repellent or absorbent. The

second, where the soil and the subsoil are absorbent, but the base repellent or absorbent. The third, where the absorbent and repellent strata, or masses, are thrown together irregularly, or not disposed in regular strata, which correspond with the surface or upper part.—*Third Class.* This comprises such lands as are liable not only to surface-waters, but to those which are subterrene, and which either descend from higher grounds in their respective neighbourhoods, or rise beneath them from subjacent reservoirs; the absorbent strata of this class being closed, and thereby rendered retentive, as in the second class or kind of land. The varieties of which are, first, where the soil is absorbent or repellent; the substrata absorbent and closed, and uniformly charged with descending waters by an even stratum of gravel, free-sand, or some other similar material. The second, where the same soil and substrata are partially charged with descending waters, through veins of sand, or gravel, or fissures of rock, &c. The third, where the soil is repellent or absorbent, the subsoil absorbent and closed, and uniformly charged with descending waters; the base repellent, with a sub-base freely absorbent and open. The fourth, where the soil is absorbent or repellent, the substrata uniformly absorbent and closed, and charged with rising waters. And the fifth, where the soil is repellent or absorbent, the substrata complex and closed, and charged with rising and descending waters.——*Observations.* It is sufficiently evident, from various circumstances in the management of lands, that some sorts are much better calculated for the production of grain-crops than those of the grass kinds; while, on the contrary, others are much more suitable and better adapted to the raising of grass than corn; and that there are still others that may be cultivated under a convertible system of corn and grass, with more success than with either crop separately. All those lands which possess a sufficient degree of dryness, whether they have much depth of mould or not, and which in their natural state have but little tendency to produce good herbage; such as those covered with different sorts of coarse plants and vegetable productions, whether in an open or inclosed state, are proper for tillage. And it has been well observed by Mr. Davis, that grounds of this nature are of considerably more value when in a state of tillage than in pasture, as they are particularly adapted to the improved methods of cultivation; and, in addition to the quantity of grain to be produced from them, will afford a greater quantity of food for animal stock, when in a tillage state, than they did when kept entirely in that of pasture or sward. The same writer likewise states, that there are various other descriptions of light lands that may be kept in a state of tillage with more advantage than in that of grass, as they are peculiarly suited to those improved methods of cultivation that are necessary for raising large supplies of green food for the support of live-stock of different kinds. That the poorer sorts of sand lands, where marl, clay, chalk, or other similar substances, can be readily procured, are much more proper for the purposes of tillage than those of grass, is sufficiently shown by the improvements that have been made in many of the more southern districts of the kingdom; and that lands of the chalky kind, whether of the more superficial or deep descriptions, are in most cases better suited for tillage than grass, is proved from their wetness in the winter season, and their openness and friability in the summer, rendering it almost impossible to establish good herbage upon them. Besides these, there is another sort of land that is better for the purposes of tillage than those of grass, which is that which, in the state of grass, is constantly so disposed to the production of moss, as to afford but a very scanty share of good herbage in any circumstances. It has been stated by the author of *Practical Agriculture*, that most of the clayey and more heavy descriptions of land, especially when situated in valleys or other low confined exposures, though they may be capable of affording good crops of particular kinds when under the plough, as those of the wheat and bean kind, are, on account of the retention of moisture, the increased expenses of labour, and the uncertainty of season for tilling them, as well as their inaptitude for most other sorts of crops, and their fitness for the production of good herbage, much more beneficial in the state of grass than in that of tillage. When there is an opportunity of procuring sea-sand, and of applying it at an easy expense, they may, however, be converted to the purposes of tillage in a profitable manner. Most of those strong cold grass-lands which, in a state of tillage, would be improper for the growth of Turnips, and other applications of improved cultivation, should also constantly remain in a state of grass: those lands likewise that are situated near large towns, where manure is plentiful, and of course procured at a reasonable rate, and where the produce of such land is always in great demand, and therefore capable of being disposed of to great advantage. Such lands as are situated on the banks of large rivers or brooks, which are capable of improvement by watering, are likewise more beneficial when kept constantly under the grass system, than any other mode of cultivation that can be practised. The lands of a calcareous nature, which are distributed in the valleys of the more mountainous districts, where old grass-land is scarce and of much importance, and most part of that in the state of tillage incapable of being converted to the condition of good grass, may be the most advantageous when continued in a permanent state of herbage. But the sorts of land that are most adapted to the practice of convertible husbandry, are those of the loamy kinds, which are not too strong for the growth of Turnips. These, in all their different varieties, are capable of being changed from the state of tillage to that of grass, and the contrary, not only without sustaining any injury, but frequently with the most evident advantage, as the practice of some of the western and midland districts has fully proved. The richer kinds of sandy lands are generally well suited to this sort of husbandry, especially where marl is at hand, to be applied at the time of laying them down to grass. Grounds of the peaty sort may likewise, in many cases, be the most beneficially employed in this mode of culture, as, from their producing little else than plants of the aquatic kind, it is obvious that they must be completely destroyed, and those of the proper grass kind be introduced, before any useful herbage can be produced. And this is capable of being accomplished in by much the most perfect manner under the state of tillage. But as they are in most instances much too tender and moist for the purpose of remaining long in the state of tillage, as soon as the above intention has been fully effected they should be restored to the state of permanent grass, either as meadows or pasture-lands.

Lantana; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, very short, converging, obscurely four-toothed, tubular. *Corolla:* one-petalled, nearly equal; tube cylindric, slender, longer than the calix, rather oblique; border flat, unequally four-cleft, obtuse. *Stamina:* filamenta four, very small, placed in the midst of the tube of the corolla, very slender, of which two are a little higher; antheræ roundish. *Pistil:* germen roundish; style filiform, short; stigma refracted, sharp downwards like a hook, and as it were obliquely growing to the tip of the style. *Pericarp:* drupe roundish, one-celled. *Seed:* nut round-pyramidal, three-

celled, the lowest cell sterile; kernels solitary, oblong. ESSENTIAL CHARACTER. *Calix:* obscurely four-toothed. *Stigma:* hook-refracted. *Drupe:* with a two-celled nucleus. —The plants of this genus are all, except the fourth species, propagated by cuttings. They may also be propagated by seeds, which several of the sorts produce in England, and the others may be easily procured from the West Indies, where there is a greater variety of these plants growing naturally than is at present known in Europe; they are all called Wild Sage by the inhabitants of the British Islands, but they do not distinguish the sorts. These seeds should be sown in pots filled with light earth, and plunged into a hot-bed of tan, because they frequently remain long in the ground before they vegetate; therefore if the plants should not come up the same year, the pots should be placed in the stove in winter, and the following spring plunged into new a hot-bed, which will bring up the plants. When these are fit to remove, they should be each planted in a small pot, and plunged into another hot-bed, observing to shade them until they have taken new root; then they should have air admitted to them every day, in proportion to the warmth of the season, to prevent their being drawn up with weak stalks; afterwards they must be treated in the same manner as other plants from the same country, till they have obtained strength; they then may be removed into an airy glass-case, or a dry-stove, where they may have a large share of air in warm weather, but protected from the cold. This is necessary for the young plants, which should not the first year be exposed to the open air, but afterwards they may be placed abroad in the warmest part of summer, and in winter upon stands in the dry-stove, where they will continue long in flower, and many of the sorts will ripen their seeds; but in winter they should be sparingly watered, for much moisture will rot their roots. If they be propagated by cuttings, the best time is in July, after the plants have been exposed to the open air for about a month, by which time the shoots will be hardened, so as to be out of danger of rotting by moisture: these cuttings should be planted in small pots filled with light earth, and plunged into a moderate hot-bed; and if they are screened from the violence of the sun in the middle of the day, they will be rooted in about six weeks, when they must be gradually hardened to bear the open air, and treated afterwards as the old plants.——The species are,

1. Lantana Mista; *Various-flowered Lantana*, or *American Viburnum.* Leaves opposite, ovate, acute, hairy; stem prickly at bottom; flowers in roundish heads; bractes lanceolate. It is about five feet high. Trunk round or roundish, with an ash-coloured bark. Whilst the flower is yet closed, the lower part of the border appears of a pale red; when it opens, the tube and upper part of the border are saffron coloured, but become reddish, and finally dark red; this change begins from the circumference, and finishes in the centre. Hence the flowers in an umbel not being all open at once, the middle appears of a saffron yellow, and the circumference of a red colour. From this change of colour, the plant has acquired the name of *mista*, or *mixed.*—Native of America.

2. Lantana Trifolia; *Three-leaved Lantana.* Leaves tern or quatern, elliptic, serrate, wrinkled above, villose beneath; stem unarmed; spikes oblong, imbricated. Flowers pale blood-red, and not changeable. Mr. Miller says there is a variety with white flowers, and leaves not quite so round, entire on the edge. It flowers from June to September—Native of the West Indies.

3. Lantana Viburnoides. Leaves-opposite, ovate-lanceolate; stem unarmed; flowers in headed spikes; involucres lanceolate.—Native of Mount Barah in Arabia.

4. Lantana Annua; *Annual Lantana.* Leaves opposite and tern cordate, rugged; stem unarmed; spikes oblong. Corollas flesh-coloured, with a yellow throat, not changeable; fruits purple, succulent, and eatable.—Native of Vera Cruz, and Jamaica. It can only be propagated by seeds.

5. Lantana Stricta. Leaves opposite, oblong-lanceolate, acute; stem unarmed; heads roundish; bractes ovate-lanceolate, squarrose.—Native of Jamaica, on Mount Diablo.

6. Lantana Radula. Leaves opposite, ovate, acute, serrate, wrinkled, rough, hirsute beneath; stem almost unarmed, rough; heads oblong; bractes ovate-acute. It has its name from its rugged leaves.—Native of the West Indies.

7. Lantana Camara; *Various-coloured Lantana.* Leaves opposite; stem unarmed, branched; flowers headed-umbelled leaflets. Corolla funnel-form; the tube and border at first pale sulphur-coloured, changing to saffron, light red, and pale crimson; tube round at the base, gibbous, widening towards the throat; drupe the size of red currants, black green, with a nauseous smell.—A decoction of the leaves of this plant is an excellent diaphoretic, and of great use in fevers, and for strengthening the stomach Outwardly applied, it will cleanse the worst ulcers, and heal up wounds, and is a good ingredient in the aromatic bath. The tea, with twenty drops of laudanum to half a pint, is good in the dysentery, and useful as a gargle in malignant sore throats. It flowers from April to September.—Native of the West Indies.

8. Lantana Odorata; *Sweet-scented Lantana.* Leaves opposite and tern, elliptic, wrinkled; stem unarmed; heads squarrose; bractes lanceolate; peduncles shorter than the leaf.—Native of the West Indies; it flowers from May to November.

9. Lantana Recta; *Upright Lantana.* Leaves opposite, oval, wrinkled; stem unarmed; heads squarrose; bractes oblong; peduncles longer than the leaf.—It flowers from June to August.—Native of Jamaica.

10. Lantana Involucrata; *Round-leaved Lantana.* Leaves opposite and tern, rhomb-ovate, blunt, wrinkled, tomentose; stem unarmed; heads squarrose; bractes ovate. Peduncles short; flowers of the same colour as in the second species, but the yellow colour of the throat soon changes to white; and hence the flower is whitish with a pale flesh-coloured margin.—Native of the West Indies.

11. Lantana Melissæfolia; *Baum-leaved Lantana.* Leaves opposite, ovate-oblong, villose, soft; stem prickly; spikes hemispherical; bractes shorter by half than the tube. Corolla yellow.—Native of South America.

12. Lantana Scabrida; *Rough Lantana.* Leaves opposite, ovate, elliptic, rugged; stem prickly; spikes hemispherical; bractes shorter by half than the tube, lanceolate, acute. It flowers in September.—Native of the West Indies.

13. Lantana Aculeata; *Prickly Lantana.* Leaves opposite, ovate, subcordate, softish underneath; stem prickly; bractes of the heads linear-wedge-form. Colour of the tube of the corolla pale-red; border lemon-coloured, changing into an orange and sometimes deeper colour. It flowers from April to November.—Native of the West Indies.

14. Lantana Aurea; *Golden-flowered Lantana.* Leaves ovate-oblong, shining; stem obscurely quadrangular, almost unarmed; corollas golden, changing to saffron-colour. Stem seven feet high, beset with ickles.—Native of the Bahama Islands.

15. Lantana Sanguinea; *Bloody-flowered Lantana.* Leaves ovate-acuminate; stem quadrangular, prickly; corollas saffron, changing to blood-red, but afterwards the tube only keeps this hue; the border, especially the upper surface,

being saffron-coloured, then scarlet, and finally of the same colour as the tube. This may be distinguished from all the other species by the very deep colour of the flower, and the property of losing its spines. It is the handsomest plant of the genus, and deserves to be esteemed for its pleasant though powerful smell, and the brightness of its colours, as well as for its flowering through the whole summer.

16. Lantana Inermis. Stem unarmed; leaves lanceolate, toothed, alternate; flowers in corymbs. Peduncles axillary, very slender; flowers pale purple; berries purple, one-seeded. —Native of La Vera Cruz and Jamaica.

17. Lantana Urticæfolia. Stem prickly; leaves oblong-cordate, serrate, opposite; flowers in corymbs, yellow.—Native of the West Indies.

18. Lantana Bullata. Leaves oblong-ovate, acuminate, serrate, wrinkled, alternate; flowers in heads, white.—Native of the West Indies.

19. Lantana Alba. Stem unarmed; leaves ovate, serrate; flowers in axillary sessile heads, white: they come out in pairs, and sit close to the branches.—This species was sent from Campeachy by Dr. Houston.

Lapeyrousia; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* spathe inferior, shorter than the corolla, of two, rarely but one, folded valves. *Corolla:* of one petal, superior, salver-shaped, nearly or quite equal; tube long, slender, triangular, its throat a little enlarged; limb in six deep segments, shorter than the tube, either quite equal and regular, or slightly irregular, in the former case horizontal, in the latter inclining. *Stamina:* filamenta three, inserted into the mouth of the tube, rather shorter than the limb, various in direction; antheræ oblong, incumbent. *Pistil:* germen inferior, roundish; style capillary, as long as the stamina; stigmas three, linear, deeply divided, spreading and recurved, downy. *Pericarp:* capsule membranaceous, three-lobed, or with three compressed dilated angles, of three cells and three valves, with very short partitions. *Seeds:* numerous, in two rows, nearly globose, or slightly angular from pressure. Essential Character. *Spatha:* of one or two folded valves. *Corolla:* salver-shaped; limb in six deep segments, shorter than the tube. *Stigmas:* three, deeply divided. *Capsule:* membranaceous, triangular, with many globular seeds.——The species are,

1. Lapeyrousia Corymbosa. Flowers regular, corymbose; tube scarcely longer than the limb; stamina widely spreading; stem two-edged, somewhat branched. Flowers numerous, blue.—Native of the Cape.

2. Lapeyrousia Falcata. Flowers slightly irregular, racemose; tube twice as long as the limb; stem compressed; leaves nearly radical, falcate, obovato-lanceolate.—From the Cape.

3. Lapeyrousia Fasciculata. Radical leaves sword-shaped, erect; floral ones crowded, recurved, undulated, obtuse, longer than the clustered flowers; corolla regular; tube twice as long as the limb; spatha of one valve. Flowers white.—Native of the Cape.

4. Lapeyrousia Fissifolia. Leaves deeply split, and clasping the stem at their base, with a short sword-shaped point; floral ones rounded; flowers purple, fragrant.—From the Cape.

5. Lapeyrousia Anceps. Leaves sword-shaped, decurrent, toothed at the outer edge; stem corymbose, spreading; corolla irregular; tube thrice as long as the limb.—Native of the Cape.

6. Lapeyrousia Silenoides. Leaves linear-sword-shaped, entire; floral ones as long as the rest; corolla irregular; tube five times as long as the limb, erect. Flowers red.—Native of the Cape.

Lapsana; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common caliculated, ovate, cornered; scales of the tube eight, equal, linear, hollow-caliculated, keeled, sharp; of the base six, imbricated, small, the alternate one smallest. *Corolla:* compound imbricated, uniform; corollules hermaphrodite, about sixteen, equal; proper one-petalled, ligulate, truncated, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* germen somewhat oblong; style filiform, length of the stamina; stigma bifid, reflex. *Pericarp:* none. *Calix:* ovate, converging. *Seeds:* solitary, oblong, cylindric, three-sided, striated. *Down:* none. *Receptacle:* naked, flat. Essential Character. *Calix:* calicled, each of the inner scales channelled. *Receptacle:* naked.—The species are,

1. Lapsana Communis; *Common Nipplewort.* Calices of the fruit angular; peduncles slender, very much branched Root annual; stem upright, stiff, from two to four feet high; branches smooth; florets yellow, from fifteen to eighteen.—Common all over Europe in hedges, shady and waste places, and all cultivated grounds; flowering during most of the summer months. It derives the English name from its supposed efficacy in curing sore nipples. Dr. Withering calls it *Dock Cresses.* At Constantinople it is said to be eaten raw, just before it comes into flower.

2. Lapsana Zacintha; *Warted Nipplewort.* Calices of the fruit torulose, depressed, blunt, sessile. Stem subdichotomous, striated, stiffish; flowers sessile, pendulous whilst young; corollas tawny underneath, yellow above.—Native of the south of Europe.

3. Lapsana Stellata; *Starry Nipplewort.* Calices of the fruit spreading all round; rays awl-shaped; stem-leaves lanceolate, undivided. Stems inclined and branched; flowers small, appearing in July.—Native of the south of Europe.

4. Lapsana Kolpinia; *Small Nipplewort.* Calices of the fruit spreading; rays spreading in a bow, and muricated; leaves linear. Annual; resembling the preceding; it flowers in July.—Native of Siberia and the Levant.

5. Lapsana Rhagadiolus; *Heart-leaved Nipplewort.* Calices of the fruit spreading all round; rays awl-shaped; leaves lyrate. Stem herbaceous, annual, a foot and a half high, upright, round, striated; flowers saffron-coloured. It flowers in June and July.—Native of Istria, the Levant, and Cochinchina.

Larch Tree. See *Pinus.*

Larkspur. See *Dalphinium.*

Laserpitium; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal, very large, with from twenty to forty rays; partial with a great many rays, flat; involucre universal many-leaved, small; partial many-leaved, small; perianth proper five-toothed, obscure. *Corolla:* universal uniform; floscules all fertile; proper of five petals, which are inflex-emarginated, almost equal, spreading. *Stamina:* filamenta five, bristly, the length of the corolla; antheræ simple. *Pistil:* germen roundish, inferior; styles two, thickish, acuminated, distant; stigmas obtuse, spreading. *Pericarp:* none; fruit oblong, angulated with eight longitudinal membranes, bipartile. *Seeds:* two, very large, oblong, semicylindric, flat on one side, on the other furnished at the back and margins with membranes (four in all.) *Observe.* The seed of the ninth species is furrowed, and without membranes. Essential Character. *Petals:* bent in, emarginate, spreading; fruit oblong, with eight membranaceous angles. Most of the plants of this genus are very hardy, and will thrive in any soil and situation: sow the seeds in autumn, and the plants will come up

in the spring; transplant them the following autumn, where they are designed to remain, for they send out long deep roots, which are frequently broken by transplanting them when large; place them three feet asunder. They will decay to the ground every autumn, but the roots continue many years, and require no other culture but to clear them from weeds.——The species are,

1. Laserpitium Latifolium; *Broad-leaved Laserwort.* Leaflets cordate, gash-serrate. Root about the thickness of a finger, striking two feet into the ground; stem round, striated, green, with a glaucous bloom on it, smooth, filled with white pith; umbel upright, flat, or somewhat convex, in the largest half a foot in diameter, composed of very many, round, striated rays; flowers white; petals inflex, obcordate, almost equal. It varies so much that it might be mistaken for a different species. This acrid aromatic plant has something of bitterness, and seems to merit a place among the aromatic stimulants, emmenagogues, and aperient sudorifics; the root is the hottest part of the plant. This plant is used in medicine by the peasants and farriers of some countries, but not by regular practitioners. It flowers in July, and ripens seed in September.—Native of many parts of Europe.

2. Laserpitium Trilobum; *Columbine-leaved Laserwort.* Leaflets three-lobed, gashed. Root perennial, round, a foot or more in length, with abundance of fibres at top, blackish on the outside, white within, with a yellowish pith in the middle, smelling when bruised, and having a bitter unpleasant taste; stem round, from four to six feet in height, marked with lines but not grooved, firm, upright, shining, glaucous-green, becoming dark purple with age, having brachiate branches, and an aromatic sweetish taste; petals small, white, attenuated at the base. It flowers from May to July.—Native of the Levant and Austria.

3. Laserpitium Gallicum; *French Laserwort.* Leaflets wedge-form, forked. Root perennial; stem not much branched, and having only one or two (seldom three) leaves at the lower part. It varies with entire rounded leaflets; indeed, few plants vary more. It flowers in June and July.—Native of the south of Europe.

4. Laserpitium Silicifolium. Root many-forked; stem smooth; leaflets pinnatifid, with lanceolate segments. Stem on open rocky hills, perennial, one or two lines thick, and sometimes not more than a span high; in a lower situation among bushes, and on the borders of woods, it grows to the height of four feet, with a stem the thickness of a pen; umbels close, flattish, composed of numerous rays; petals white or yellowish.—Native of Carniola and Italy.

5. Laserpitium Angustifolium; *Narrow-leaved Laserwort.* Leaflets lanceolate, quite entire, sessile. Flowers white; seeds winged, curled. It flowers in June and July.—Native of the southern parts of Europe.

6. Laserpitium Prutenicum. Leaflets lanceolate, quite entire, the outmost united. Root perennial; stem hirsute; seeds pubescent, acrid, aromatic.—Native of Prussia, Leipsic, Austria, Carniola, Dauphiny, and Italy.

7. Laserpitium Dauricum. Stem spotted; leaflets pinnatifid, acuminate. Root subfusiform, the thickness of a finger, dirty white, with thickish fibres all round. This is a biennial plant, the whole of which is smooth, has some smell when bruised, and a slightly aromatic acrid taste.—Native country unknown.

8. Laserpitium Peucedanoides. Leaflets linear-lanceolate, veined, striated, distinct. Stem a foot high; flowers white. —Native of Monte Baldo.

9. Laserpitium Siler; *Mountain Laserwort.* Leaflets oval-lanceolate, quite entire, petioled. Root perennial, with a thick head, which is crowned with abundant bristly remains of former leaves, a foot and a half in length, the thickness of the human thumb, round, with an irregular brown bark, fleshy, and white within, with a yellowish pith. The whole plant smooth. The seeds have a strong smell of cumin, and an aromatic subacrid bitter taste. The root is extremely bitter, and might be useful in fevers, cachexies, loss of appetite, &c.; an infusion of it in wine has been successfully given in disorders of the stomach; it yields an aromatic resinous juice on being wounded, and, being made into a syrup, is recommended in disorders of the breast. It flowers in July and August, and ripens seed in September.—Native of Austria, Switzerland, and France.

10. Laserpitium Diffusum. Leaves superdecompound; leaflets linear, awl-shaped, somewhat hairy; universal involucres lanceolate, membranaceous. Root perennial, striking very deep, and but little branched; stem a foot and a half high, terminated by one or two umbels, solid, smooth, slightly striated; umbels very numerous, convex; petals white.—Native of Switzerland, France, and Italy.

11. Laserpitium Lucidum; *Shining Laserwort.* Leaves superdecompound, linear-awl-shaped; universal involucre smooth, pinnate. Root woody, large, with several forks, crowned with bristles and scales of fallen leaves; stem straight, grooved half a foot high; flower often purple. It flowers in July.—Native of Switzerland.

12. Laserpitium Chironium. Leaflets obliquely cordate; petioles hirsute.—Native of Montpellier in the south of France.

13. Laserpitium Ferulaceum; *Fennel-leaved Laserwort.* Leaflets linear. It flowers in June.—Native of the Levant.

14. Laserpitium Simplex. Scape naked; leaflets simple; leaves pinnate, multifid, acute, linear; umbel semiglobular. Root perennial, knobbed, and often multiplied at top, so as to produce several stems, only two or three inches high, terminated by a solid, rounded, reddish umbel.—Native of the mountains of Switzerland, Austria, and Dauphiny.

15. Laserpitium Aciphylla. Stem sheathed; petioles dilated; leaves digitate, linear, elongated, mucronate.—Native of New Zealand; found in Queen Charlotte's Sound.

Lasia; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Calix:* spathe awl-shaped, twisted, coloured, very long; spadix shorter than the spathe, entirely covered with florets. *Corolla:* petals four, fleshy, obtuse, concave, closely embracing the organs of generation. *Stamina:* filamenta four, short, flat, hidden by the petals; antheræ two to each filament, rounded, concave, protruding beyond the corolla. *Pistil:* germen superior, roundish; style none; stigma rather abrupt. *Pericarp:* berry small, roundish, unequal. *Seed:* solitary, roundish. Essential Character. *Spadix:* covered with florets. *Petals:* four, fleshy, inferior. *Antheræ:* two to each filament. *Berry:* with one seed.——There is but one species,

1. Lasia Aculeata. A stemless plant, six feet nigh, with large pinnatifid leaves, on long, round, upright stalks. This is the *cu chaóc gai* of the Cochin-chinese.—Native of the moist plains of Cochin-china.

Lasiopetalum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, wheel-shaped, hairy, in five deep equal, ovate, folded, at length expanded segments, permanent, often coloured. *Corolla:* petals five, minute, roundish, inserted into the base of the calix between its segments. *Stamina:* filamenta five, very short, opposite to the petals; antheræ terminal, ovate, two-lobed behind, opening by two pores at the top. *Pistil:* germen superior, globose, with three furrows,

very hairy: style short, straight, smooth; stigma simple, acute. *Pericarp:* capsule invested with the calix, nearly globose, with three angles, downy, of three cells, and three valves; partitions from the centre of each valve. *Seeds:* few, roundish, inserted into the inner heads of the partitions. ESSENTIAL CHARACTER. *Calix:* wheel-shaped, in five deep folded segments. *Petals:* five, minute, opposite to the stamina. *Antheræ:* opening by two terminal pores. *Capsule:* superior, of three cells, and three valves, with the partitions from their centre.——The species are,

1. Lasiopetalum Ferrugineum; *Rusty Woolly Blossom.* Leaves alternate, linear-oblong, dependent; flowers racemose. The whole shrub more remarkable for singularity than beauty. —Native of marshes in New South Wales.

2. Lasiopetalum Ledifolium; *Rosemary-leaved Woolly Blossom.* Leaves opposite, linear-lanceolate, spreading; stalks single-flowered; bractes remote from the flower.—Native of New Holland.

3. Lasiopetalum Purpureum; *Purple Woolly Blossom.* Leaves oval, entire. A green-house shrub, flowering from April to July.—Found in New Holland.

4. Lasiopetalum Arborescens; *Nettle-tree-leaved Woolly Blossom.* Leaves heart-shaped, deeply toothed. A green-house plant, flowering from May to July.—Native of New South Wales.

5. Lasiopetalum Triphyllum; *Three-leaved Woolly Blossom.* Leaves three together, the middle one largest and lobed; stamina ten, the intermediate ones abortive; petals wanting. A green-house shrub; the whole plant clothed with rather soft starry pubescence. Long clusters, of several flowers, grow solitarily, opposite to the large leaves, between the small ones; calix blush-coloured, hairy; antheræ dark brown, with yellow lips.—Found in Lewin's Land, and on the west coast of New Holland.

6. Lasiopetalum Quercifolium; *Oak-leaved Woolly Blossom.* Leaves three together, all sinuated, the middle one largest and three-lobed, somewhat pinnatifid; stamina five; petals wanting.—Found at King George's Sound, on the west coast of New Holland.

7. Lasiopetalum Corniculatum; *Horned Woolly Blossom.* Leaves three together, cut, and crenate, the lateral ones very small; petals with linear points as long as the calix.—Found in King George's Sound.

Lasiostoma; a genus of the class Tetrandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, very short, five-parted; divisions acute; at its base two opposite scales. *Corolla:* one-petalled, funnel-form; tube cylindric; border four-cleft; divisions acute, villose. *Stamina:* filamenta four, capillary, villose at the base, inserted into the tube of the corolla; antheræ oblong. *Pistil:* germen ovate, superior; style longer than the corolla; stigma obtuse. *Pericarp:* capsule orbiculate, one-celled, with a brittle bark. *Seeds:* two, hemispherical. ESSENTIAL CHARACTER. *Calix:* very short, five-petalled, with two acute scales. *Corolla:* funnel-form, four-cleft. *Capsule:* orbiculate, one-celled, two-seeded.——The only known species is,

1. Lasiostoma Rouhamon. This is a shrub, with a trunk seven or eight feet in height, and six or seven inches in diameter, with a grayish, irregular, rugged bark, and a whitish wood; branches and branchlets opposite, covered with a russet down; the branchlets are knobbed, and at each joint have a pair of leaves, which are entire, smooth, oval, ending in a point, and three-nerved underneath; flowers in small axillary corymbs, on a small peduncle, which has two scales at the base; they are opposite, in pairs, and almost sessile; corolla white; capsule yellow; from the axils of the leaves there spring at intervals simple tendrils, two inches and a half long, curved back in form of a cross at top, where they become thicker; by means of these tendrils, the branches support themselves on the neighbouring trees. A variety occurs with smooth branches, larger leaves, and smaller flowers and fruits; it has no tendrils, but the branches are straight. The shrub is called *rouhamon* by the Caribs.—It is in flower and fruit during the months of October and November; and is found on the banks of the river Sinemari, in Guiana, forty leagues from its mouth.

Lathræa: a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, campanulate, straight; mouth deeply four-cleft; *Corolla:* one-petalled, ringent; tube longer than the calix; border ringent, ventricose; upper lip concave, galeated, broad, with a narrow hooked tip; lower lip less reflex, obtuse, trifid. *Nectary:* an emarginate glandule, depressed on each side, very short, inserted into the receptacle of the flower at the other corner of the germen. *Stamina:* filamenta four, awl-shaped, length of the corolla, hid under the upper lip; antheræ obtuse, depressed, converging. *Pistil:* germen globose, compressed; style filiform, length and situation of the stamina; stigma truncated, nodding. *Pericarp:* capsule roundish, obtuse with a point, one-celled, two-valved, elastic, coated with a very large spreading calix. *Seeds:* few, subglobose, affixed to the middle of the valves. *Observe.* It approaches nearly, on account of its glandule, to *Orobanche.* ESSENTIAL CHARACTER. *Calix:* four-cleft; gland depressed at the base of the suture of the germen. *Capsule:* one-celled.——The species are,

1. Lathræa Clandestina; *Hidden Toothwort.* Stem branched almost under ground; flowers upright, solitary. Root thick, long, fibrous; stem half a palm high, surrounded by a few very short, thick, sharp leaves, and terminated by five or six naked peduncles, three inches long, each bearing one flower of a blue colour, nearly two inches in length.—Native of France, the Pyrenees, and Italy.

2. Lathræa Phelypæa; *Doubtful Toothwort.* Corollas spreading, bell-shaped. This is a tender juicy plant, a palm and half high; stem surrounded by abundance of soft succulent leaves, broad at the base, and ending in a sharp point; from the top come out three or four tubular funnel-shaped flowers, an inch or an inch and a half in length, of a yellow colour, divided at top into five segments.

3. Lathræa Anblatum; *Eastern Toothwort.* Lips of the corollas undivided.—Native of the Levant.

4. Lathræa Squamaria; *Great Toothwort.* Stem quite simple; corollas pendulous; lower lip trifid. Root beaded, branched, and surrounded with white succulent scales. It is parasitical, and generally attached to the roots of Elms, Hazels, or some other trees in a shady situation. Flowers in a spike, from one side of the stem, in a double row: corolla pale purple or flesh-coloured, except the lower lip, which is white. The flowers appear in April, emerging from the decayed leaves of trees, among which the plant is mostly found half buried. The English name, *Toothwort,* is derived from the resemblance of the scaly roots to the human fore-teeth.—Native of most parts of Europe; with us it is found near Maidstone, in Kent; Harefield, in Middlesex; Exton, near Stamford; in the woods of Derbyshire; at Conzick-scar, near Kendal, Westmoreland; and near Gainsford, in Durham; in Scotland it has been observed at Mevisbank, towards Laswade, four or five miles from Edinburgh; and in Morvern, near the Sound of Mull.

Lathyrus; a genus of the class Diadelphia, order Decandria.—GENERIC CHARACTER. *Calix:* perianth one-leafed,

half five-cleft, bell-shaped; divisions lanceolate, sharp; the two upper ones shorter, the lowest longer. *Corolla:* papilionaceous; standard obcordate, very large, reflex on the sides and tip; wings oblong, lunulate, short, obtuse; keel half-orbiculate, size of the wings, and wider than the wings, gaping inwards in the middle. *Stamina:* filamenta diadelphous, (single and nine-cleft) rising upwards; antheræ roundish. *Pistil:* germen compressed, oblong, linear; style erected upwards, flat, wider above, with a sharp tip; stigma from the middle of the style to the tip villose in front. *Pericarp:* legume very long, cylindric or compressed, acuminate, one-celled, bivalve. *Seeds:* several, cylindric, globose, or but little cornered. ESSENTIAL CHARACTER. *Calix:* two upper segments shorter. *Style:* flat, villose above, broader at the end.—All the plants of this genus may be propagated by sowing their seeds either in spring or autumn; but those sown in autumn, should have a light soil and a warm situation, where the plants will abide the winter, flower early in the following spring, and ripen their seeds in July; but those which are sown in spring should have an open exposure, and may be planted upon almost any soil, if not too wet, for they are not tender plants, nor do they require much culture. They should all be sown where they are designed to remain, for they seldom succeed when they are transplanted, unless it be done while the plants are young; so that where they are sown for ornament, there should be four or five seeds sown in a small patch, in different parts of the borders of the flower-garden; when they come up, weed them carefully, and when they are grown two or three inches high, put some sticks down to support them, otherwise they will trail on the ground, or whatever plants stand near them, and become unsightly.——The species are,

* *With one-flowered Peduncles.*

1. Lathyrus Aphaca; *Yellow Lathyrus,* or *Vetchling.* Peduncles one-flowered; tendrils leafless; stipules sagittate-cordate. Root annual, fibrous; stem from a foot to eighteen inches or more in height, trailing, or climbing, four-cornered, smooth; flowers small, solitary, axillary; corolla, standard yellow, striped on the inside with blue lines; wings yellow, nearly round, the length of the keel, with two unequal paler claws; keel pale sulphur-coloured, cloven behind.—Native of most parts of Europe, in corn-fields, chiefly in light land, flowering in June, July, and August. It has been observed near Tottenham and Enfield, and between Bungay and Norwich; it is not uncommon in Cambridgeshire.

2. Lathyrus Nissolia; *Crimson Lathyrus,* or *Grass Vetch.* Peduncles one-flowered; leaves simple; stipules awl-shaped. Stem upright, simple, angular, twisted, slightly hairy; corolla beautiful crimson colour: hence the flowers are so elegant, that it deserves to be admitted into the garden. The young plant before it flowers is so like a grass, owing to its simple grassy leaves, that an experienced botanist might fail to discover it, especially among mowing grass, where it usually occurs: it is also found on the borders of corn-fields among bushes, and in woods; but does not appear to be very common in England, which certainly may arise from its being so liable to be overlooked.

3. Lathyrus Sphæricus. Peduncles one-flowered, awned; tendrils two-leaved, quite simple; leaflets ensiform. Flowers small, like those of the preceding.—Native place unknown.

4. Lathyrus Amphicarpos; *Subterranean Lathyrus,* or *Earth Pea.* Peduncles one-flowered, longer than the calix; tendrils two-leaved, quite simple. Root annual, filiform, with here and there ovate-sessile tubercles; flowers pale purple. Stems several, weak, two-edged; there are other stems destitute of leaves, roundish, creeping under ground, whitish, and bearing flowers and fruit absolutely perfect, and resembling those on the stems above ground, except that the flowers are smaller, and do not expand.—Native of the Levant.

5. Lathyrus Cicera; *Flat-podded Lathyrus,* or *Dwarf Chichling Vetch.* Peduncles one-flowered; tendrils two-leaved; legumes ovate, compressed, channelled on the back. Root annual, simple; flowers of a middling size; corolla white or pale yellow, or red and white, very seldom blue, sometimes quite red, or deep purple. It flowers in June and July.—Native of France and Spain.

6. Lathyrus Sativus; *Common Lathyrus,* or *Blue Chichling Vetch.* Peduncles one-flowered; tendrils two or four leaved; legumes ovate, compressed, two-edged at the back. The same habit as the preceding; flower twice as large, generally white, sometimes tinged with purple, or having a rose-coloured standard, or blue or blue and white variegated, in its native countries; but in our gardens it is distinguished by the blue colour of the corolla, though we sometimes have a milk-white variety. The seed-pods afford a more certain mark of distinction, being usually short, broad, and winged on the back. In several parts of the continent, a white light pleasant bread is made from the flour of this pulse; but it produced such dreadful effects, that the dukes of Wirtemberg forbad the use of it by edict in 1671, 1705, and 1714. Mixed with wheat flour in half the quantity, it makes very good bread, that appears to be harmless; but bread made of this flour only, has brought on a most surprising rigidity of the limbs in those who have used it for a continuance; insomuch that the exterior muscles could not by any means be reduced, or have their natural action restored. These symptoms usually appeared on a sudden, without any previous pain; but sometimes they were preceded by a weakness and disagreeable sensation about the knees; baths both hot and cold, fomentations, and ointments of various kinds, have been tried without effect; insomuch that it is regarded as incurable, and being neither very painful nor fatal, those who were seized with it usually submitted to it with patience. Swine fattened with the meal, lost the use of their limbs, but grew very fat lying upon the ground. A horse, fed some months on the dried herb, was said to have his legs perfectly rigid. Cows are reported to grow lean on it, but sheep not to be affected. Pigeons, especially if young, lose the power of walking by feeding on the seed; poultry will not readily touch it; but geese eat it without any apparent detriment; and as it is commonly sown in Switzerland for soiling horses, and the cattle there feed on the herb without any harm, it would be well worth the trouble of ascertaining whether the noxious qualities of this plant do not greatly, if not entirely, depend upon the soil in which it is cultivated, for it has been already observed, that the seed is much more deleterious from a strong, fat, moist soil, than from dry lands. The Florentine peasants eat it boiled, or mixed with wheat flour, in the quantity of one-fourth, without receiving any harm.—In the countries where it is cultivated, the seeds are sown at the end of August or the beginning of September, or in the spring, and in strong ground; for in a light dry soil, the roots are very weak, and it is apt to be destroyed by spring frosts. Its produce is very abundant, and the culture not being expensive, is very general in some parts.

7. Lathyrus Inconspicuus; *Small-flowered Lathyrus.* Peduncles one-flowered, shorter than the calix; tendrils two-leaved, simple; leaflets lanceolate; standard and wings of the corolla deep red.—Native of the Levant.

8. Lathyrus Setifolius. Peduncles one-flowered; tendrils two-leaved; leaflets setaceous, linear. Annual.—Found near Montpellier; and on Monte Baldo, in Italy.

9. Lathyrus Angulatus. Peduncles one-flowered, awned; tendrils two-leaved, quite simple; leaflets linear; stipules lanceolate. Annual.—Native country unknown.

10. Lathyrus Articulatus; *Jointed-podded Lathyrus.* Peduncles one or two flowered; tendrils many-leaved; leaflets alternate. The flower has the keel of a pea, waved on the sides, and not oblique; standard bright red, with white wings and keel.—Native of the south of Europe.

** *With two-flowered Peduncles.*

11. Lathyrus Odoratus; *Sweet Pea*, or *Painted Lady.* Peduncles two-flowered; tendrils two-leaved; leaflets ovate-oblong; legumes hirsute. This is an annual plant, which rises from three to four feet high, by means of its long claspers or tendrils. The flower-stalks come out at the joints, are about six inches long, and sustain two large flowers, which have a strong odour; and are succeeded by oblong hairy pods, having four or five roundish seeds in each. In the common sort, the corolla has dark purple standards, with the keel and wings of a light blue. Other varieties are, the white; the pink with a white keel, and the wings pale blush colour; the pink or blush-coloured standard, with both keel and wings white; the rose-coloured standard, with the wings and keel pale blue: those that have a mixture of red with white or pale blue, are called Painted Ladies. There is also a variety of the common dark sort, with the keel pale violet, and the wings dark violet. According to Linneus, the common dark sort is a native of Sicily, and the Painted Lady of Ceylon.—They all deserve a place in every good garden, as well for their fragrance as their beauty. The gardeners who raise Sweet Peas for the London markets, sow them in the autumn in pots, and secure them from severe weather, by placing them in hot-bed frames, by which means they can bring them early to market. They may be continued in flower the whole summer by repeated sowings in the spring; and must be watered frequently when sown in pots.

12. Lathyrus Annuus; *Two-flowered Yellow Annual Lathyrus.* Peduncles two-flowered; tendrils two-leaved; leaflets ensiform; legumes smooth; stipules two-parted. This rises with a climbing stalk five or six feet high, having two membranes or wings running from joint to joint; the flowers are small, yellow, and succeeded by long taper pods containing several roundish seeds.—Native of France and Spain.

13. Lathyrus Fruticosus; *Shrubby Lathyrus.* Stem shrubby; peduncles two-flowered; leaves pinnate, tomentose. Flowers axillary, on short, white, tomentose peduncles, with one bracte to each flower; corolla yellow; calix globular.—Native of Peru, on the hills near Huanuco.

14. Lathyrus Tingitanus; *Tangier Lathyrus* or *Pea.* Peduncles two-flowered; tendrils two-leaved; leaflets alternate, lanceolate, smooth; stipules crescent-shaped.—Native of Barbary.

15. Lathyrus Clymenum. Peduncles two-flowered; tendrils many-leaved; stipules toothed.—Native of the Levant.

*** *Peduncles many-flowered.*

16. Lathyrus Hirsutus; *Hairy Lathyrus.* Peduncles commonly three-flowered; tendrils two-leaved; leaflets lanceolate; legumes hirsute; seeds rugged. Stems angular, twisted, slightly hairy; flowers an inch or an inch and half from each other; corolla purple, with yellow lines within.—Native of many parts of Europe, but not common in England. It flowers in July.

17. Lathyrus Tuberosus; *Tuberous Lathyrus.* Peduncles many-flowered; tendrils two-leaved; leaflets oval; internodes naked. Root creeping, putting out irregular tubers, about as big as those of the Pig Nut, covered with a brown skin. Corollas deep red. This plant is cultivated in Holland for the roots, which are sold in the market, and eaten there. When two inches or upwards in length, they may be considered as fit for use. Boil them from two to three hours, till a fork will pass through them; when sufficiently soft, dry them, and roast them gently, serving them up in a cloth in the same manner as chestnuts, for which they are a good substitute, and persons used to them become very fond of them.—With us it is only cultivated for ornament, being a beautiful hardy perennial, resembling the Everlasting Pea, but of an humbler growth. It flowers in July and August.—Native of France, Germany, Flanders, Holland, Switzerland, Austria, and Siberia. The plant will grow in any ground, but a light rich soil suits it best. As the roots, if not restrained, spread extensively as well as penetrate very deep, it is advisable to form a border inclosed all around with brick-work, about twenty inches deep, paving the bottom with bricks. The tubers, each of which will produce a plant, should be put into the earth about six inches from each other, and three inches deep. In two years they will be fit for use, and should be taken up as wanted. The bed should be dug in regular course from one end, leaving the smaller tubers and fibres to produce a succession of plants, adding some fresh rich soil every year.

18. Lathyrus Pratensis; *Meadow Lathyrus.* Peduncles many-flowered; tendrils two-leaved, quite simple; leaflets lanceolate. Root perennial, creeping; stems a foot or eighteen inches high, and sometimes three feet, or even more, in length; flowers in a raceme; corolla yellow. In old authors, this plant is much reprobated as a vile weed, that spreads much by means of its creeping roots; and accordingly Mr. Miller excludes it from gardens. Many modern writers, however, recommend it as an excellent food for cattle, and not without reason, since its quality is good, and it bears a large burden of succulent leafy stalks. Mr. Swayne, however, asserts that it does not seem at all agreeable to cattle, and that, where they have a choice of feed, they seldom touch it. It is called in English, Common Yellow or Meadow Vetchling, and Tare Everlasting.—Native of meadows, pastures, woods, thickets, and hedges, in most parts of Europe, flowering from June to August.

19. Lathyrus Sylvestris; *Wild Lathyrus*, or *Narrow-leaved Everlasting Pea.* Peduncles many-flowered; tendrils two-leaved; leaflets ensiform; internodes membranaceous. Root perennial; stems six feet or more in height, climbing or trailing, spreading widely, branched, winged, and smooth; corolla red and white; standard large, rose-coloured, faintly netted-veined; wings violet; keel whitish green.—Native of most parts of Europe. In England it is found between Castle Camps and Bartlow, in Cambridgeshire; between Bath and Bristol; near Conway, in Wales; between Pershore and Eckington, in Worcestershire; on Shelton bank near Salop; and near Pensford in Somersetshire; in the vicinity of London it is rare, but has been observed in the Oak-of-honour Wood near Peckham; and it grows abundantly in many parts of Kent and Bedfordshire.

20. Lathyrus Latifolius; *Broad-leaved Everlasting Pea.* Peduncles many-flowered; tendrils two-leaved; leaflets ovate, or lanceolate; internodes membranaceous. Root perennial; stalks several, thick, climbing by means of tendrils to the height of six or eight feet, or even higher in woods: these die to the ground in autumn, and new ones rise in the spring from the same root; corolla pale purplish rose-colour. This is a showy plant for shrubberies, wilderness quarters, arbours, and trellis work; but too large and rampant for the borders of the common flower-garden. Bees resort much to it, and the flowers furnish them with abundance of

honey. It yields a great quantity both of green fodder and seeds; but in what degree the former might be agreeable to cattle, and the latter to pigeons or poultry, must be seen by experience.—It is a native of many parts of Europe, in hedges and woods. Mr. Ray observed it, about a century and a half ago, in the Cambridgeshire woods, and it still keeps its post there. It is also found on the rocks near Red Neese, by Whitehaven; and at Seven Stoke Copse, in Worcestershire. The flowers appear at the end of June and the beginning of July.

21. Lathyrus Heterophyllus. Peduncles many-flowered; tendrils two and four leaved; leaflets lanceolate; internodes membranaceous. Flowers in racèmes of about six together; standard and wings flesh-coloured; keel whitish. Perennial. —Native of Sweden, Switzerland, France, and Silesia.

22. Lathyrus Palustris; *Marsh Lathyrus.* Peduncles many-flowered; tendrils many-leaved; stipules lanceolate. Root perennial, creeping; the whole plant smooth; flowers three, or more, pointing one way, in erect racemes; corolla vivid purplish-blue, of great beauty.—Native of many parts of Europe, in moist woods and pastures, but not common here.

23. Lathyrus Pisiformis; *Siberian Lathyrus.* Peduncles many-flowered; tendrils many-leaved; stipules ovate, broader than the leaflet. Plant growing like the Pea; corolla with the standard and wings whitish with purple veins. It flowers in June.—Native of Siberia.

24. Lathyrus Myrtifolius. Stalk naked, tetragonal; stipules half-sagittate, lanceolate, acuminate; leaflets four, oblong-lanceolate, acute, mucronate, venose-reticulate; peduncles longer than the leaf; commonly three-flowered.—It resembles the twenty-second species, flowers in July and August, and grows in the salt-marshes of Pennsylvania and New York, and is very abundant about Lake Onondago.

25. Lathyrus Venosus. Stalk naked, tetragonal; stipules half-sagittate, ovate, acuminate; leaflets numerous, subalternate, ovate, obtuse, mucronate, venose; peduncles shorter than the leaf; containing from five to ten flowers. It produces purple flowers in July and August; and grows in the low meadows of Pennsylvania.

26. Lathyrus Decaphyllus. Stalk tetragonal; stipules half-sagittate, linear; leaflets oblong-elliptical, mucronate; peduncles with three and four large purple flowers; the pods are also large.—Native of the banks of the Missouri.

Lavandula; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, ovate; mouth obscurely toothed, short, permanent, supported by bractes. *Corolla:* one-petalled, ringent, resupine; tube cylindric, longer than the calix; border spreading; one lip looking upwards, larger, bifid, spreading; the other lip looking downwards, trifid; divisions all roundish, nearly equal. *Stamina:* filamenta four, short, within the tube of the corolla, deflected, of which two are shorter; antheræ small. *Pistil:* germen four-parted; style filiform, length of the tube; stigma two-lobed, obtuse, converging. *Pericarp:* none; calix converging with the mouth, and guarding the seed. *Seeds:* four, obovate. Essential Character. *Calix:* ovate, obscurely toothed, supported by a bracte. *Corolla:* resupine. *Stamina:* within the tube. ——The species are,

1. Lavandula Spica; *Common Lavender.* Leaves sessile, lanceolate-linear, rolled back at the edge; spike interrupted, naked. Root perennial, thick, woody; stem shrubby, much branched, frequently five or six feet high, four-cornered, acute-angled, tomentose. The flowers are produced in terminating spikes from the young shoots, on long peduncles; the spikes are composed of interrupted whorls, in which the flowers are from six to ten, the lower whorls more remote: each flower is upright, on a short pedicel. The common colour of the corolla is blue, but it varies with white flowers. —The variety called the Broad-leaved Lavender, has much shorter and broader leaves; and the branches are shorter, more compact, and fuller of leaves. It will continue several years without producing flowers; and when it does, the leaves on the flowering stalks approach nearer to those of Common Lavender, but still remain broader. The stalks grow taller, the spikes looser and larger, and the flowers smaller, and appear a little later in the season.—Lavender is a plant which has been long celebrated for its virtues in nervous disorders. According to Dr. Cullen, it is, "whether externally or internally, a powerful stimulant to the nervous system; and amongst others of this order, named *cephalics*, the Lavender has probably the best title to it." He adds, "it appears to me probable that it will seldom go farther than exciting the energy of the brain to a fuller impulse of the nervous power into the nerves of the animal functions, and seldom into those of the vital." It may however be with great propriety that professor Murray has dissuaded from its use, where there is any danger from a stimulus applied to the sanguiferous system. It is, however, still probable that Lavender stimulates the nervous system only, and therefore may be more safe in palsy than the warmer aromatics, especially when not given in a spirituous menstruum, or along with heating aromatics, as is commonly done in the case of the Spiritus Lavandulæ Compositus. The officinal preparations of Lavender are, the essential oil, a simple spirit, and a compound tincture. The essential oil has been used for stimulating paralytic limbs, and for several external purposes. Hill says the flowers are the parts used: they are good against all disorders of the head and nerves, and may be taken in the form of tea. The famous spirit of Lavender called Palsy-drops, and the Sweet Lavender-water, are made with them. The best way to make the Palsy-drops is as follows: put into a small still a pound of Lavender flowers, and five ounces of the tender tops of Rosemary; put to them five quarts of common molasses spirit, and a quart of water: distil off three quarts; put to this, cinnamon and nutmegs, of each three quarters of an ounce, red sander's wood half an ounce; let them stand together a week, and then strain off the spirit. The Lavender-water is thus made: put a pound of fresh Lavender flowers into a still with a gallon of molasses spirit, and draw off five pints; this is Lavender-water. A conserve made of the young tops, just as they are going into flower, possesses all the virtues of the plant, and is an excellent cordial medicine, of great efficacy in most nervous disorders, and paralytic complaints; it likewise operates by urine, and promotes the menses. The Compound Spirit of Lavender is also an excellent preparation for the above purposes, as it has the advantage of containing many other ingredients of a like nature. It is best taken on a lump of sugar, in which method forty or fifty drops may be given for a dose.—Native of the south of Europe, on mountains, by way-sides, and in barren places; also of Asia and Africa. This plant is propagated by cuttings or slips planted in March in a shady situation, or in a border where they may be shaded by mats until they have taken root; after which they may be exposed to the sun, and when they have obtained strength, should be removed to the places where they are to remain. These plants will abide much longer in a dry, gravelly, or strong soil, in which they will endure our severest winters; but they will grow much faster in summer on a rich, light, moist soil, but are then generally destroyed by the winter, and are neither so strong-scented, nor so fit for medicinal uses, as those which grow on a barren rocky

soil. It was formerly in use to make edgings to borders, but it grows too large for the purpose; if often cut in dry weather it is subject to decay, and, in hard winters, some of the plants will be killed: it should therefore be planted in beds in the kitchen-garden, where the soil is driest.

2. Lavandula Stoechas; *French Lavender.* Leaves sessile, linear, tomentose, rolled back at the edge; spikes contracted, comose; bractes subtrilobate. It has a low thick shrubby stalk, about two feet high, sending out woolly branches the whole length; leaves about an inch long, hoary, and pointed, of a strong aromatic scent. The branches are terminated with scaly spikes of purple flowers, four-cornered, and an inch in length; and at the top a coma, or small tuft of purple leaves. The whole plant has a very strong aromatic agreeable odour. There is a variety with peduncles three times the length of those in the common Stoechas, and naked; the spikes are longer, and not so thick; and the leaves of the coma are more numerous, longer, and of a brighter purple colour. Both these vary to purple and white in the corolla, but the most common colour is blue.—Native of the south of Europe; flowering from May to July. This plant, which our old authors call *Sticadonc*, *Sticados*, and *Sticadore*, from the Italian *Sticade*, on account of its being found on the islands called Stoechades, may be cultivated by sowing the seeds upon a bed of light dry soil in March. When they come up, clear them from weeds until they are two inches high, and then remove them. For this, prepare a spot of light dry ground, lay it level, and tread it out into beds, into which set the plants, at five or six inches' distance every way, watering and shading them until they have taken root. If the winter should prove severe, cover them with mats or pease-haulm. In March or at the beginning of April in the following spring, remove them into the places where they are to remain, taking a warm moist season, if possible, for this purpose, and not letting them remain long above ground. The soil should be warm dry sand or gravel; and the poorer the soil is, the better will this plant endure the winter. In a rich moist ground it will not produce so many flowers, nor will they have so strong an aromatic scent. It may also be increased by slips or cuttings; but the plants raised from seeds are by far the best.

3. Lavandula Viridis; *Madeira Lavender.* Leaves sessile, linear, wrinkled, villose, rolled back at the edge; spike comose; bractes undivided. It differs from the preceding by its wrinkled villose leaves, which are green, and not hoary as in that. It flowers from May to July.—Native of the island of Madeira. This, and most of the following sorts, require the protection of a green-house. They may be increased by slips or cuttings; and also by seeds, but they do not all produce seeds in our climate.

4. Lavandula Dentata; *Tooth-leaved Lavender.* Leaves sessile, linear, pectinate-pinnate; spike contracted, comose. It has a woody stalk, two or three feet high, with four-cornered branches on every side the whole length. The leaves have a pleasant aromatic odour, and warm biting taste. The flowers are produced in scaly spikes, at the ends of the branches, on long naked peduncles. It flowers from June to September.—Native of Spain and the Levant. This is propagated by slips or cuttings, planted in April, and treated as directed for the first and second sorts. They will take root very freely, but must be transplanted into pots, that they may be sheltered from severe frost in winter, especially while young. When they have acquired strength, some may be planted in a warm situation, on a dry soil, where, being prevented from growing too vigorously, they will endure cold better than in richer ground.

5. Lavandula Pinnata; *Pinnated Lavender.* Leaves petioled, pinnate; leaflets wedgeform; spike imbricate. This is a low, very branching shrub, with a brownish bark; peduncles leafless; corolla purple or pale violet. The flowers have a sweet smell, but the leaves have very little smell or taste. It flowers from April to October.—Native of Madeira.

6. Lavandula Multifida; *Cut-leaved Canary Lavender.* Leaves petioled, pinnate; leaflets decursively pinnatifid; spike quadrangular; angles spiral. Corolla varying from blue to white. The leaves are hoary, opposite, cut into many divisions to the midrib; these segments are again divided into three blunt ones. There is a variety with an upright branching stalk, four feet high, and flowers smaller than the common Lavender.—It is a native of the Canary islands. Sow the seeds on a moderate hot-bed, in the spring. When the plants come up, put each into a separate small pot filled with light earth. Plunge the pots into another hot-bed; and in the beginning of June inure them to the open air, and towards the end of the month place them in a sheltered situation. In July the flowers will appear, and, if the autumn prove warm, the seeds will ripen in September; but when they do not perfect seeds, the plants may be preserved through the winter in a good green-house, where they will produce flowers and seeds most part of the season.

7. Lavandula Abrotanides; *Southernwood-leaved Canary Lavender.* Leaves doubly pinnatifid, with linear segments, nearly smooth; spike linear, mostly branched and interrupted; bractes smoothish, ovate, with approximated ribs.—Native of the Canaries.

Lavatera; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth double; exterior one-leafed, trifid, obtuse, short, permanent; interior one-leafed, half five-cleft, more acute, more erect, permanent. *Corolla:* petals five, obcordate, flat, spreading, affixed below to the tube of the stamina. *Stamina:* filamenta numerous, coalescing below into a tube, loose above, gaping at the tip and surface of the tube; antheræ reniform. *Pistil:* germen orbicular; style cylindric, short; stigmas several, (seven to fourteen,) bristly, length of the style. *Pericarp:* capsule orbicular, composed of as many cells as there are stigmas, bivalve, and articulated in a whorl round the columnar receptacle, at length falling off. *Seeds:* solitary, reniform. Essential Character. *Calix:* double, outer trifid. *Arils:* very many, one-seeded.——The species are,

1. Lavatera Arborea; *Tree Mallow.* Stem arboreous; leaves seven-angled, hairy, plaited; peduncles clustered, one-flowered, axillary; outer calices larger. It rises in gardens with a strong thick stalk to the height of eight or ten feet, dividing into many branches at the top; flowers mostly in pairs, sometimes three together, on upright peduncles, an inch and half in height; corolla purplish-red, with dark blotches at the base, spreading, bell-shaped; seeds kidney-shaped, ash-coloured.—Native of Italy, the Levant, and Britain. With us it is smaller than it appears in the gardens; and is found near Hurst Castle, upon Portland Island, and Denny Island near Bristol; in Cornwall and Devonshire; at Teignmouth; upon the rocks of Caldey Island; in Anglesea, and other parts of Wales; upon the Basse Islands near Edinburgh; and upon Inch Garvie and Mykrie Inch in the Firth of Forth. It flowers from June or July to September or October.—This, with all the other shrubby sorts, are easily propagated by seeds, which should be sown in the spring, upon a bed of light earth; and when the plants are about three or four inches high, they should be transplanted to the places where they are designed to remain; for, as they shoot out long fleshy roots which have

but few fibres, they do not succeed well if they are transplanted after they are grown large. If the seeds of these plants be permitted to scatter on the ground, the plants will come up in the following spring; and when they happen to fall into dry rubbish, and are permitted to grow therein, they will be short, strong, woody, and produce a greater number of those flowers than plants which are more luxuriant. As these plants continue a long time in flower, a few plants of each sort may be allowed a place in all gardens where there is room. Several of them will only last two years, except upon dry ground, where they will endure three or four years, but seldom longer. They mostly require some protection in winter.

2. Lavatera Micans; *Shining Tree Mallow.* Stem arboreous; leaves seven-angled, acute, crenate, plaited, tomentose; racemes terminating. On the upper surface of the leaves are brimstone-coloured micæ, shining in the sun.—Native of Spain and Portugal.

3. Lavatera Olbia; *Downy-leaved Lavatera.* Stem shrubby; leaves five-lobed, hastate; flowers solitary. Flowers on a short peduncle, axillary, very seldom two together; terminating ones in a spike. It flowers from June to October.—Native of the south of France.

4. Lavatera Triloba; *Three-lobed Lavatera.* Stem shrubby; leaves subcordate, subtrilobate, rounded, crenate; stipules cordate; peduncles one-flowered, aggregate. Corolla large, spreading, pale purple, with the claws white, hairy. It flowers from June to September.—Native of France and Spain.—

5. Lavatera Lusitanica; *Portuguese Lavatera.* Stem shrubby; leaves seven-angled, tomentose, plaited; recemes terminating. Flowers in Aug. and Sept.—Native of Portugal.

6. Lavatera Maritima; *Sea-side Tree Mallow.* Stem shrubby; leaves cordate, roundish-lobed, crenate, tomentose; flowers solitary. Stem reddish, covered with bundles of hairs so small as to seem dots of meal, branched, two feet high; corolla large, twice the size of the first species, spreading very much, whitish, with very narrow purple claws. It flowers from July to September.—Native of Spain and the south of France.

7. Lavatera Thuringiaca; *Great-flowered Lavatera.* Stem herbaceous; fruits naked; calices gashed. Lower leaves heart-shaped, crenate, roundish-lobed; upper hastate, on short petioles; corolla large, spreading, pale violet or purplish.—Native of Sweden, Germany, Hungary, and Tartary. It flowers from July to September.

8. Lavatera Cretica; *Cretan Lavatera.* Stem upright; lower branches diffused; peduncles clustered, one-flowered; leaves lobed, upper ones acute. Root annual, fibrous, of thick fibres a foot in length, with innumerable other capillary fibres; corolla twice the length of the calix, pale blue, with oblong emarginate petals. It flowers in July.—Native of the island of Candia. This and the other annuals are propagated by seeds sown at the end of March or the beginning of April, upon a bed of fresh light earth. When the plants are come up, carefully clear them from weeds, and in very dry weather now and then refresh them with water. When they are about two inches high, transplant them into the places where they are designed to remain, which should be in the middle of the borders in the flower-garden; for if the soil be good, they will grow two or three feet high. Be careful, in transplanting them, to preserve a ball of earth to their roots, otherwise they are apt to miscarry; and also water and shade them until they have taken root, after which they will require no other care, except to weed, and fasten them to stakes to prevent their being injured by strong winds. The seeds may be sown also in autumn. When the plants come up, transplant them into small pots, which, toward the end of October, should be placed in a common hot-bed frame; where, being defended from severe frosts, the plants will abide the winter very well. In the spring, shake them out of the pots, and replant them into larger, or else into the full ground, where they may remain to flower. The plant thus managed will be larger, and flower stronger and earlier, than those sown in the spring; and from these you will constantly have good seeds, whereas those sown in the spring sometimes miscarry.

9. Lavatera Trimestris; *Common Annual Lavatera.* Stem herbaceous, rugged; leaves smooth; peduneles one-flowered; fruits covered with a ring. Root annual, white, with spreading beards; flowers solitary, axillary, on peduncles shorter than the petioles; corolla large, spreading, bell-shaped, pale flesh-colour, with whitish lines; seeds ferruginous. This species varies very much, and the varieties are constant. It flowers from July to September.—Native of the south of Europe and the Levant.

Lavender. See *Lavandula.*

Lavender Cotton. See *Santolina.*

Lavender Sea. See *Statice Limonium.*

Lavenia; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common ovate, subimbricate; scales ten to fourteen, lanceolate, equal, permanent. *Corolla:* compound uniform; corollets hermaphrodite equal, (fifteen to twenty;) proper funnel-form, dilated at the base; border five-cleft, patulous. *Stamina:* filamenta five, filiform, shorter than the tube; antheræ oblong, flattish, twin, slightly connate. *Pistil:* germen oblong; style filiform, longer than the corollet, two-parted; stigmas flattish, clubbed. *Pericarp:* none; calix permanent, spreading. *Seeds:* subclavate, a little wrinkled, viscid with glandules; down with three awl-shaped awns, glandulose at the base. *Receptacle:* naked. Essential Character. *Calix:* nearly regular. *Style:* bifid. *Down:* three-awned, glandular at the tip. *Receptacle:* naked.——The species are,

1. Lavenia Decumbens. Stems simple, decumbent; leaves subcordate, bluntly serrate; pistil longer than the corollet. Annual.—Native of Jamaica.

2. Lavenia Erecta. Stem branched, erect; leaves elliptic, sharply serrate. Root annual, fibrous, whitish; heads of flowers flat, consisting of numerous pale blue florets.—Native of the East Indies, and of the Society Isles.

Laugeria; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, superior, with unequal mouth, small, deciduous. *Corolla:* one-petalled, salver-form; tube very long; border five-cleft; divisions obovate. *Stamina:* filamenta five, very short; antheræ linear, long, beneath the throat. *Pistil:* germen subovate, inferior; style filiform, rather longer than the tube; stigma headed. *Pericarp:* drupe roundish, umbilicated with a point. *Seed:* nut two or five celled, according to Swartz: furrowed, according to Jacquin. Essential Character. *Corolla:* five-cleft. *Drupe:* with a five-celled nut.——The species are,

1. Laugeria Odorata. Leaves subovate, acute, smooth; stem somewhat spiny; racemes panicled; drupes with five-celled nuts. An upright branching shrub, ten feet high; flowers of a dirty red, very sweet during the night; fruits black, larger than peas, soft, very numerous, falling when ripe with every slight motion of the bush.—Native of America, Carthagena, Havannah, &c.

2. Laugeria Lucida. Leaves oblong, blunt, entire, membranaceous, shining; racemes dichotomous; drupes with two-celled nuts. Flowers on short pedicels, distant.—Native of the West Indies, Jamaica, and Santa Cruz.

3. Laugeria Tomentosa. Leaves ovate, acute, entire, tomentose underneath; racemes dichotomous; drupes with two-celled nuts.—Native of Jamaica.

Laurel. See *Laurus* and *Prunus.*

Laurel, Spurge. See *Daphne.*

Laurus; a genus of the class Enneandria, order Monogynia.—Generic Character. *Calix:* none, except it be the corolla. *Corolla:* petals six, ovate, acuminate, concave, erect; the alternate ones exterior. Nectary consisting of three acuminated coloured tubercles, ending in two bristles, standing round the germen. *Stamina:* filamenta nine, shorter than the corolla, compressed, obtuse, three in each rank; antheræ growing on each side to the margin of the filamentum, on the upper part; glandules two, globose, with a very short footstalk, affixed to each filamentum of the inner rank near the base. *Pistil:* germen subovate; style simple, equal, length of the stamina; stigma obtuse, oblique. *Pericarp:* drupe (or berry) oval, acuminate, one-celled, comprehended by the corolla. *Seed:* nut ovate-acuminate; kernel of the same form. *Observe.* The greater part of the species, including the Cinnamon and Camphor, are hermaphrodite; several are dioicous, as in the ninth species, (Laurus Nobilis,) which has mostly from eight to fourteen stamina, with a deeply four-parted corolla. The corpuscles annexed to some of the stamina afford the essential character. Essential Character. *Calix:* none. *Corolla:* calicine, six-parted. *Nectary:* of three two-bristled glands surrounding the germen. *Filamenta:* inner glanduliferous. *Drupe:* one-seeded.—The species are,

1. Laurus Cinnamomum; *Cinnamon Tree.* Leaves three-nerved, ovate-oblong; nerves disappearing toward the end. The Cinnamon-tree of America is twenty feet or more high; trunk about six feet high, and a foot and half in diameter; the outer bark smoothish, and of a dusky cinereous colour; it has spreading branches that form an elegant head; leaves shining, coriaceous, of a bright green above, pale underneath, with the nerves whitish; flowers small, greenish-yellow, almost insipid, with a somewhat fetid smell, resembling that of Lilium Martagon. Fruit the form and size of a middling olive. The inner bark perfectly resembles the oriental Cinnamon in smell, taste, and figure; the only difference is, that it has a coarser texture, and a more acrid taste, which may arise from the climate. But the varieties of Cinnamon are numerous. The timber is white, and not very solid; the root is thick and branching, and exudes abundance of Camphor. It flowers in February and March, and is a native of Martinico on the mountain Calebrasse, and also of Brazil.—Gærtner describes the fruit of the Ceylonese Cinnamon as a subglobular berry, flatted a little at top, and torulose, covered at the base by the calix, which is thick, coriaceous, angular, sublobate, and having from six to nine unequal teeth; the pulp or flesh is very thick, and grows fungous with age, smelling strong of Cinnamon; seed spherical, covered with a crustaceous brittle thin coat. The inner bark of this species is the spice so well known under the name of Cinnamon. The use of the Cinnamon-tree, however, is not confined to the bark, for it is remarkable that the leaves, fruit, and root, all yield oils of different qualities, and of considerable value. That produced from the leaves is called Oil of Cloves, and Oleum Malabathri; that from the fruit is extremely fragrant, and of a thick consistence, and at Ceylon is said to be made into candles for the sole use of the king: and the bark from the root not only affords an aromatic oil, which has been called Oil of Camphor, but also a species of Camphor which is purer and whiter than the common sort. Cinnamon is one of the most grateful of aromatics; its qualities are extracted by both water and spirit. It is an astringent, corroborating the viscera, and proves of great service in several kinds of alvine fluxes, and immoderate uterine discharges. An essential oil is sometimes extracted from Cinnamon, which is so excessively pungent that it will produce an eschar on the skin if applied to it; but in doses of a drop or two, properly diluted with sugar, mucilages, &c. it is said to be one of the most immediate cordials and restoratives in cases of languor and debility. Cinnamon, says Meyrick and Hill, is certainly a most excellent cordial, which may be procured in any form at the shops. It promotes the appetite, and is one of the best remedies known for fluxes, and other disorders of the stomach and bowels.——The bark of the Cinnamon-tree, whilst on the tree, is first stripped of its outer greenish coat; and is then cut longitudinally from the tree, and dried in the sand, till it becomes fit for the market, when it is of a reddish yellow or pale rusty iron-colour, very light, thin, and curling up into flakes. The best sort of Cinnamon, which grows in great plenty in Ceylon, and is peculiar to that island, is called by the natives *rasse coronde*, or Sharp Sweet Cinnamon. It is this choice sort which was exported by the Dutch East India Company, and prohibited, under severe penalties, to mix any other sort with this.—The second is called *canatte coronde*, or Bitter Astringent Cinnamon. The bark of this comes off very easily, and smells very agreeably when fresh, but has a bitter taste. The root of this yields a very good sort of camphor. It has an advantage, that it is not so plentiful as the first; because it requires much skill and attention to distinguish them.—The third is called *capperoe coronde*, or Camphorated Cinnamon, because it has a very strong taste and smell of camphor. It grows plentifully in the island, but not in the eastern part; yet the Ceylonese, when under the Dutch, found means to send it over privately, and sell it to the English and Danes trading upon the coast of Coromandel. Besides, there is a sort of Canella growing upon the continent of India about Goa, which is very like this, though it has nothing of the true Cinnamon. This sort certainly agrees in many things with the Canella Malabaricus Sylvestris, a wild Cinnamon-tree growing upon the coast of Malabar.—The fourth sort is called *welle coronde*, or Sandy Cinnamon, because upon being chewed it feels gritty, or as if grains of sand were between the teeth. The bark comes off easily, but is not so readily rolled up. It is of a sharp bitterish taste, and the roots yield only a small quantity of camphor.—The fifth sort is called *sewel coronde*, Glutinous or Mucilaginous Cinnamon. This acquires a considerable degree of hardness in drying, has little taste, and an ungrateful smell; but the colour is fine, and the fraudulent Ceylonese mix a good deal of it with the best sort, which in colour it much resembles. The genuine or best sort may, however, be distinguished by some few yellowish spots towards the extremities.—The sixth sort is called *nieke coronde*, the tree bearing much resemblance to another tree which the natives call *nieke gas.* The bark has no taste or smell, and is only used by the natives in medicine. By roasting it they obtain an oil, with which they anoint themselves to keep off infection; and they express a juice from the leaves, with which they rub their heads, to cool and strengthen the brain.—The seventh is called *dawel coronde*, or Drum Cinnamon; the wood being light and tough, and used by the natives for making drums. The bark is taken off while the tree is yet growing; it is of a pale colour, and is used for the same purpose as the sixth.—The eighth sort is called *catle coronde*, Thorny or Prickly Cinnamon; the tree being very prickly. The bark is in some measure like that of the true Cinnamon, but it has nothing of the taste or smell, and the leaves differ very much. The

natives apply the root, bark, and leaves, in form of cataplasms, to tumors.—The ninth sort is called *mael coronde*, or Flowering Cinnamon, being always in blossom. The flowers come nearest to those of the first sort, but they bear no fruit. The wood never becomes so solid and weighty in this as in the others, which are sometimes eight, nine, or ten feet in circumference. If this tree be cut or bored into, a limpid water will issue from the wound, as from the Birch-tree, but it is of no use, any more than the leaves and bark. This is the male-tree of the true Cinnamon. There is a tenth sort called *toupat coronde*, or Three-leaved Cinnamon, which does not grow near the Dutch settlements, but higher up towards Candia.—With respect to the time when the bark is fit to be taken off, some trees are ready two or three years sooner than others, owing to the difference of soil which they grow in: those, for instance, which grow in valleys where the ground is a fine whitish sand, will be fit to have the bark taken off in five years; but others which stand in a wet slimy soil, must have seven or eight years to grow before they are fit to bark. Those trees are also later which grow in the shade of other large trees, whereby the sun is kept from their roots. Hence also it is, that the bark of such trees has not that sweetness observable in the bark of those which grow in a white sandy ground, where, with little wet, they stand full exposed to the sun; but is rather of a bitterish taste, somewhat astringent, and smells like camphor: for by the heat of the sun's rays the camphor is made so volatile, that it rises up and mixes with the juices of the tree, where it undergoes a small fermentation, and then rising still higher between the wood and the thin inner membrane of the bark, it is so effectually diffused through the branches and leaves, that there is not the least trace of it to be perceived. Meanwhile that thin and glutinous membrane which lines the bark on the inside, attracts all the purest and sweetest particles of the sap, leaving the thick and gross ones to push forwards, in order to nourish the branches, leaves, and fruit. If the bark be fresh taken off, that sap which remains in the tree has a bitterish taste, not unlike that of cloves. On the contrary, the inner membrane of the bark, when fresh taken off, has a most exquisite sweetness, whilst the outer part differs very little in taste from that of other trees. But when the bark is laid in the sun to be dried and rolled up, this oily and agreeable sweetness of the inner membrane is diffused through the whole. The bark may be taken off from trees that have stood fourteen, fifteen, or sixteen years, according to the quality of the soil: but beyond that time they lose by degrees their agreeable sweetness, and the bark acquires more of the taste of camphor; it also then becomes so thick, that, when laid in the sun, it will no longer roll up, but remain flat. To account for the great quantities of Cinnamon still remaining on the island of Ceylon, after the general exportation of the bark that has prevailed during several centuries, some authors have assured us that after the bark has been stripped off the tree, it becomes fit to be stripped a second time in four or five years. But this assertion is no less contrary to observation, than it is to the common course of nature. The truth is, the barked trees being cut down, quickly put forth new shoots, which in a period of from five to eight years come again to the knife. Great numbers also of trees are continually springing from the fruit, which either drops upon the ground, or is disseminated by the wild doves, called here Cinnamon-eaters; insomuch that here and there along the roads, such quantities of the young trees are to be seen, as to look like little woods. The Cinnamon-tree is now cultivated in the West Indies: in 1792 samples of their product were examined by competent judges, who declared it to be equal to that from Ceylon.—Neither this, nor the next species, is so tender as most persons imagine; indeed the tender treatment of the plants brought to England has generally destroyed them. Great heat is certainly prejudicial to them: when the plants therefore have taken new roots in the pots or tubs, they should in summer be placed in a glass-case, where they may have plenty of air in warm weather; and in winter they should be placed in a stove moderately warm.

2. Laurus Cassia; *Cassia*, or *Wild Cinnamon*. Leaves triple-nerved, lanceolate. The narrower leaves tapering at each end, distinguishes this from the preceding species. This tree grows, says Mr. Marsden, from fifty to sixty feet high, with large, spreading, horizontal branches, almost as low as the earth. The young leaves are mostly of a reddish hue; the blossoms grow six in number, upon slender footstalks, close to the bottom of the leaf; they are monopetalous, small, white, and stellated in six points. The root is said to contain much camphor. The bark is commonly taken from such of the trees as are a foot or eighteen inches in diameter, for when they are younger, it is said to be so thin as to lose all its qualities very soon. Those trees which grow in a high rocky soil, have red shoots, and the bark is superior to that which is produced in a moist clay, where the shoots are green. I have been assured, continues Mr. Marsden, by a person of extensive knowledge, that the Cassia produced in Sumatra is from the same tree that yields the true Cinnamon, and that the apparent difference arises from the less judicious manner of quilling it. Perhaps the younger and more tender branches should be preferred; perhaps the age of the tree, or the season of the year, ought to be more nicely attended to; and it is suggested that the mucilage which adheres to the inside of the fresh-peeled rind, does, when not carefully taken off, injure the flavour of the Cassia, and render it inferior to that of the Cinnamon. It is said to be sometimes purchased by the Dutch merchants, and shipped for Spain as Cinnamon, being packed in boxes which arrived from Ceylon with that article. It is of the same quality as Cinnamon, but inferior in fragrancy and efficacy. The bark is of a mucilaginous nature, for which it is preferable to the Cinnamon in purging, and disorders of the bowels; it is an excellent remedy for those complaints, in doses of a few grains powdered. There appears little doubt that this is the same with the preceding species, as the difference of the bark may probably be owing to the difference of soil, and still more to the want of skill and attention in the cultivators. The Cassia bark is coarsest, and will not roll up like true Cinnamon; but the essential difference between the bark of Cinnamon and Cassia is, that the former is always dry, whereas the latter becomes macilaginous in chewing; hence it has been suggested as a conjecture, on the most respectable authority, that the superior excellence of Cinnamon bark may be in a great measure owning to its being deprived of that mucilage which adheres to the internal surface. At least it is certain, that in a curious drawing of Herman's, in the possession of the late Sir Joseph Banks, representing the process of cutting and preparing Cinnamon in the island of Ceylon, one of the principal figures is that of a woman, who is evidently employed in this operation, of scraping the mucilage from the inner surface of the bark.—Native of Malabar, Java, and Sumatra.

3. Laurus Camphora; *Camphor* or *Camphire Tree*. Leaves triple-nerved, lanceolate, ovate. This is a large tree, very near akin to the Cinnamon, from which it differs in the leaves. Branches ascending; flowers white, on simple, long, lateral branches; berry small, ovate, dusky or browish red. Mr. Marsden also describes it as equal in height

and bulk to the largest timber-trees, being frequently found upwards of fifteen feet in circumference. Camphor is considered as one of the principal diaphoretics and antiseptics, and as possessing a degree of anodyne or antispasmodic power. It is a medicine of a subtile and penetrating nature, and quickly diffuses itself through the whole habit: if taken in a considerable quantity, it produces an uneasy sensation in the stomach, though it does not heat the body so much as might be expected from its taste; on the contrary, it often rather occasions a sense of coolness. In acute diseases it is given from a quarter of a grain, to one or two grains or more, in conjunction with nitre, or other anti-inflammatory medicines of the saline kind. Hoffman observes, that it answers best on the approach of a crisis, or in the decline, and that it should be used with caution during the height of fever, where the heat is great and the skin dry; and the same caution, he adds, should be observed in plethoric habits. In chronical disorders it is used more freely, and sometimes in conjunction with opium: it is considered as a corrector of the irritating powers of cantharides. Camphor alone has sometimes been known to cure that peculiar species of spasmodic disorder, called St. Vitus's dance. Camphor is also used in a dissolved state in spirit of wine, as an external embrocation in rheumatic pains, paralytic numbness, &c. and is also an ingredient in many other preparations. Hill says it is sudorific, and works by urine, promotes the menses, and is good in disorders of the bladder. Meyrick observes, that it is an excellent medicine in low putrid fevers, especially when combined with the dulcified mineral acids. A solution of it in rectified spirits of wine, in the proportion of an ounce to a pint or thereabouts, is frequently applied successfully to bathe such parts as are affected with rheumatic pains, the palsy, or sprains; and for dispersing swellings, hard tumors, and inflammations, and stopping the progress of mortification. It is also used in the form of an ointment for burns, and eruptions of the skin. Taken in an over dose, it occasions coldness of the extremities, giddiness, and pain at the stomach; the best remedy for which is an emetic, or draught of vinegar. Camphor oil is a valuable domestic medicine, much used by the Sumatrans in strains, swellings, and in inflammations; the particles, from their extreme subtilty, readily entering the pores. It is not manufactured, undergoes no preparation, and, though termed an oil, is rather a liquid and volatile resin, without any oily quality. To procure it, they make a transverse incision into the tree, to the depth of some inches, and then cut sloping downwards from above the notch, till they leave a flat horizontal surface; this they hollow out, till it is of a capacity to receive a quart; they then put into the hollow a bit of lighted reed, and let it remain about ten minutes, which acting as a stimulus, draws the fluid to that part: in the space of a night, the liquor fills the receptacle prepared for it, and the tree continues to yield a smaller quantity for three successive nights, when fire must be again applied; but on a few repetitions, it is exhausted. Native Camphor, the *capoor-barroos* of the Malays, is a production for which Sumatra and Borneo have in all ages been much celebrated; the Arabians being at a very early period acquainted with its virtues. Camphor, being of a dry nature, does not exude from the tree, or manifest any appearance on the outside. The natives, from long experience, know whether any is contained within, by striking the tree with a stick; in that case, they cut it down, and split it with wedges into small pieces, finding the Camphor in the interstices, in the state of a concrete crystallization. Some have asserted that it is from the old trees alone that this substance is procured, and that in the young trees it is in a fluid state, called *meenio capoor*, or Camphor Oil; but this is a mistake. The same sort of tree that produces the fluid, does not produce the dry transparent flaky substance, nor ever would. They are readily distinguished by the natives: many of the trees, however, produce neither the one nor the other. It has been generally supposed that the Chinese mix the Camphor of Sumatra and Borneo with their own and the Japanese: but the truth seems to be, that they purchase the former for their own use, from an idea of its superior efficacy, and export the latter, as a drug which they hold in no estimation. It is certain that the common Camphor will evaporate until it entirely disappears; whereas, that of Sumatra and Borneo, called Native Camphor, (though, doubtless, from its volatility, it must be subject to some decrease,) does not appear to lose much in quantity by being kept. It is purchased on the spot at the rate of six Spanish dollars the pound, or eight dollars the catty, for the best sort, which sells at the China market for about twelve or fifteen hundred dollars the pecul of one hundred catties, or one hundred and thirty-three pounds and a third: the traders usually distinguish three degrees of quality, by the names of *head*, *belly*, and *foot*, according to its purity and whiteness; some add a fourth sort, of extraordinary fineness, of which a few pounds only are imported to Canton, and sell there at the rate o two thousand dollars the pecul.—The principal part of the Camphor that is used in Europe, is prepared from this tree in Japan; the natives split the wood into small pieces, and sublime or distil it with water in an iron retort, covered with an earthen or wooden head, in the hollow of which they fasten hay or straw, to which the Camphor adheres as it rises; it is brownish or white, but in very small semi-pellucid grains: it is packed up in wooden casks, and forwarded to India and Europe, where it is purified by a second sublimation, and reduced into the solid mass in which we find it in our shops. The wood of this tree is much esteemed by carpenters, being easy to work, light, durable, and not liable to be injured by insects, particularly by the combang, a species of bee, which, from its faculty of boring timber for its nest, is whimsically called the *carpenter*.—Native of China, Japan, Borneo, and probably of Sumatra. In Europe this tree is propagated by layers, which are generally two years, and sometimes longer, before they take root; hence the plants are very scarce, and in general males, so that there can be no hopes of procuring seed from them. If the berries of this, and also of the Cinnamon-tree, were procured from the places of their growth, and planted into tubs of earth, as directed for the Sassafras-tree, there might be a number of these plants procured in England; and, if sent to the British colonies in America, they might be there cultivated so as to become a public advantage. The Portuguese brought some of the Cinnamon-trees from the East Indies, and planted them upon the Isle of Princes, on the coast of Africa, where they now abound, overspreading great part of the island. The Camphor-tree does not require any artificial heat in winter; so that, if it be placed in a warm dry green-house, it will thrive very well. In winter it must be sparingly watered, and in summer be placed abroad in a warm situation, not too much exposed to the heat of the sun. It may be propagated by laying down the young branches in autumn.

4. Laurus Culilaban. Leaves triple-nerved, opposite.—Native of the East Indies and Cochin-china.

5. Laurus Montana. Leaves tripled-nerved, ovate-acuminate, perennial; flowers raceme panicled.—Native of Jamaica.

6. Laurus Chloroxylon; *Jamaica Laurel*, or *Greenwood*. Leaves three-nerved, ovate, coriaceous; nerves reaching the tip. This tree rises with a strong branched trunk to a very considerable height; the inward bark is of a light blood colour, inclosing a strong greenish timber; leaves smooth, resembling those of the Camphor-tree; fruit scattered up and down upon the branches, about the size of a hazel-nut. The wood is very tough and hard, answering better than any other sort for the cogs in the rolls of a sugar mill: it is generally esteemed as one of the best timber-woods in the island of Jamaica, and used on all occasions where strength and durability are required.

7. Laurus Glauca. Leaves nerved, lanceolate, perennial; branchlets tubercled; flowers solitary. This is a tree with spreading branches. The expressed oil of the nuts is used in Japan for making candles.—Native of Japan.

8. Laurus Pedunculata. Leaves nerved, oblong, entire; flowers solitary, peduncled. Stem shrubby; branches round, knobbed with fallen leaves.—Native of Japan.

9. Laurus Nobilis; *Common Sweet Bay*. Leaves ovate-lanceolate, perennial, veined, shining; axils of the veins glandular underneath; flowers in very short racemes. The leaves are of a deep green, highly and pleasantly aromatic; flowers borne by old trees only, pale yellow; fruit black, the size of an unripe olive, strongly aromatic. This celebrated plant has attracted the attention of all ages. In England it appears only as a shrub, but in the southern parts of Europe it becomes a tree of twenty or thirty feet in height; much subject, however, in general, to put out suckers. There is some confusion among persons ignorant of Botany, between this plant and what we now commonly call Laurel (Prunus Laurocerasus) which is known only to modern times. What we now call Bay was formerly and correctly called Laurel, and the fruit alone was named Bayes. It is certainly the Δαφνη (*Daphne*) of the Greeks, and the true *Laurus* of the Romans, which was destined to furnish the Delphic wreath, to grace the head of the triumphant hero, to guard the gate of the Cæsars and the Pontifex Maximus, and to be placed on the houses of the sick. The Delphic priestess wore it on her head, and chewed the leaves, and then threw them on the sacred fire.—Mr. Miller makes three sorts of the Sweet Bay. 1. The Broad-leaved Bay of Asia, Spain, and Italy, (almost too tender for the open air in England,) with leaves much broader and smoother than those of the common sort. 2. The Common Bay, which is seldom hurt with us except in very severe winters; of this there are two varieties, one with plain leaves, the other with leaves waved on the edges. 3. The Narrow-leaved Bay, with very long narrow leaves, not so thick as those of the two preceding, and of a light green; the branches are covered with a purplish bark, and the male flowers come out in small clusters from the axils of the leaves, sitting close to the branches. It is to be found in the nurseries with variegated leaves; and other trifling varieties are mentioned by old authors. The leaves and berries have an aromatic astringent taste, and a fragrant smell; the berries are much stronger than the leaves: both are accounted stomachic, carminative, and uterine; in which intention the leaves are infused and drank as tea, and the essential oil of the berries administered on sugar, or dissolved by means of mucilages, or in spirits of wine, in the dose of a few drops: they are also very useful in fomentations, &c.: The berries are given in powder or infusion, they are of a more heating nature than the leaves, and are excellent to attenuate cold thick viscid humours, create an appetite, remove obstructions, promote the menses, and the necessary evacuations after delivery. Four or five moderate doses will frequently cure the ague, and people who are troubled with paralytic disorders, would often find relief from small doses of them continued for a considerable length of time. There is an oil or ointment made from them, and kept in the shops, which is good for pains in the joints, the cramp, numbness of the limbs, &c.; it also alleviates pain in the ears, by being dropped into them; and speedily takes away the black and blue marks occasioned by blows and falls. The Germans call this plant *lorbeerbaum*; the Danes *laurbærtræe*; the Swedes, *lagerbarstrad*; the French, *laurier*; the Italians, *alloro*; the Spaniards, *laurel*; the Portuguese, *loiro* and *loireiro*; and the Russians, *lawr* or *lawro woe derewo*.—Native of the southern parts of Europe, and of Asia. Ray observed it in the woods and hedges of Italy. Haller says it abounds in all the orchards about Moutru, near the lake of Geneva. According to Scopoli, it is found in the woods of Istria. Bellonius remarked it on Mount Ida, and in very large trees on mount Athos. Abbé St. Pierre observes, that fine Bay-trees are no where more common than on the banks of the river Peneus in Thessaly, which might well give occasion to the fabled metamorphoses of Daphne, daughter of that river. Mr. Evelyn makes mention of Bay-trees thirty feet high, and almost two feet in diameter in the trunk. In the last century, abundance of these trees were raised, with curious round heads, and kept in tubs; they were imported from the continent. The berries are ripe at the end of January or beginning of February, when they ought to be gathered, and preserved in dry sand till the beginning of March; then, or as soon as the weather becomes favourable, on a shady border of rich loose undunged soil, made fine, and well protected, drop the berries in rows fifteen inches asunder, and four inches in the row, sifting over them fine rich mould an inch thick: as soon as you perceive the plants to heave up the earth, refresh them frequently but moderately with water in the mornings when cold, in the evenings when mild weather, and continue to do so all the summer months. Let them remain two years, watering them during the second summer. This species is generally propagated by suckers; but it may be propagated by layers, so also may the tenth and thirteenth species. The best way, however, is to sow the berries in pots, and plunge them into a moderate hot-bed, which will bring up the plants much sooner than if they were sown in the full ground, and they will have more time to acquire strength before winter; but the plants must not be forced with heat, therefore they should be inured to bear the open air at the beginning of June, into which they should be removed, where they may remain till autumn: then the pots should be placed under a common frame, that the plants may be protected from hard frost, but in mild weather they may enjoy the free air; for while the plants are so young, they are in danger of suffering in hard frost. The spring following, those sorts which will not live in the open air, should be each transplanted into separate pots; but the common sorts may be planted in nursery beds, six inches asunder each way, where they may grow two years, by which time they will be fit to plant where they are designed to grow: the other sort must be constantly kept in pots, and should every year be new potted, and, as they advance in growth, they must have larger pots. As these plants require shelter in winter, a few of them will be enough for a large greenhouse. Such as are intended to be increased by layers, should be laid down in March or August; the latter is the best season, and by the second spring will make good plants. This sort will also grow by cuttings, though but slowly in the open ground; in the beginning of April, therefore, prepare a moderate hot-bed of tanner's bark, and cover

it eight inches deep with rich loose fresh earth; plant the cuttings five inches deep, and eight or nine asunder, rubbing off their leaves; water them gently every evening while the weather continues warm, and cover the glasses with mats during the heat of the day: when the cuttings have shot, let them receive all mild gentle showers, and the evening dews; the beginning of August the glasses may be taken off, and replaced when the weather begins to be frosty, keeping them open every mild day; at the beginning of April following, or as soon as the weather becomes temperate, remove both glasses and frames; continue frequent and plentiful waterings during the summer months, as the weather may require, and the succeeding April they will be strong, well rooted, and fit for removal into the nursery, where, after having cut away the superfluous roots and branches, attentively encouraging the leading shoot, they may be planted in a well-sheltered quarter of light mould, in rows three feet and a half asunder, and eighteen inches in the row. Dig the ground in autumn and spring; keep it clean, loose, and mellow in summer, and prune the plants annually in April. Let them continue three, but not more than four years before they are planted out where they are to remain. The Broad and Narrow-leaved Bay are not so hardy as the common sort, and will scarcely live abroad whilst young, in common winters, without shelter. In severe winters the old trees are frequently killed, or at least the branches are much injured; the plants are therefore frequently kept in tubs, and housed in winter. The Gold-striped Bay is also tender; it is usually kept in pots, and housed with hardy green-house plants; it will survive in the open ground, but will be tarnished and sometimes much injured in severe winters: it is a strong rich variegation; the method of increasing it is by budding on the plain sort. The Common Bay will make a variety in all evergreen plantations, and as it will grow under the shade of other trees, where they are not too close, it is very proper to plant in the borders of woods, where they will have a good effect in winter. In a warm dry sandy or gravelly soil, this tree will attain the height of thirty feet; but, to secure its fine verdure, it should be planted in situations that are not exposed to north and north-east winds, from which it frequently suffers in severe winters, but generally recovers in summer. Not a single branch should be taken from it, except in the spring. As an elegant and beautiful plant, yielding a most refreshing and salubrious smell to a considerable distance, it cannot be too much encouraged; and to persons of classical taste, it can never fail to excite many pleasing ideas, by recalling to their minds the distinguished manner in which it is mentioned in Holy Writ, Psalm xxxvii. 35; and the various fine passages and allusions of the ancient poets.

10. Laurus Indica; *Royal Bay*, or *Indian Laurel*. Leaves oblong-lanceolate, perennial, somewhat glaucous underneath, the edges at the base rolled back; racemes elongated. Flowers terminating, below racemed, above panicled. It is a large tree, with ascending branches. Loureiro observes, that the wood is of a yellow colour, not heavy, good for building, but still better for furniture. It is called *vigniatico* in the island of Madeira, and is probably what is imported into England under the name of Madeira Mahogany: it is hardly to be distinguished from mahogany, except that it is somewhat less brown.—Native of Madeira, the Canary Islands, Virginia, Japan, and Cochin-china.

11. Laurus Fœtens; *Madeira Laurel*, or *Til*. Leaves veined, elliptic, acute, perennial; axils of the veins villose underneath; racemes elongated, compound, panicle-form.—Native of Madeira and the Canary Islands.

12. Laurus Persea; *Alligator Pear*. Leaves ovate, coriaceous, transversely veined, perennial; flowers corymbed. It grows to the height of thirty feet, and has a trunk as large as our common apple-trees. The fruit is the size of one of our largest pears, inclosing a large seed with two lobes, included in a thin shell; the pulp is covered with a tough skinny coat. This fruit is held in great esteem in the West Indies: the pulp is of a pretty firm consistence, and has a delicate rich flavour; it gains upon the palate of most persons, and becomes agreeable even to those who cannot like it at first; but it is so rich and mild, that most people make use of some spice or pungent substance to give it a poignancy; and for this purpose some make use of wine, some of sugar, some of lime juice, but most of pepper and salt. It seems equally agreeable to the horse, the cow, the dog, and the cat, as well as to all sorts of birds; when plentiful, it makes a great part of the delicacies of the negroes.—Native of the West Indies. This plant is propagated by seeds, which should be obtained as fresh as possible from the countries of its growth; if they are brought over in sand, they will be more likely to grow than when dry. Set them in pots filled with rich light earth, plunged into a hot-bed of tanner's bark, keeping them pretty warm, and water them frequently, but moderately, when the earth appears dry. In five or six weeks the plants will come up. Treat them very tenderly by keeping up the bed to a due temperature of heat; and when the weather proves warm, admit the fresh air by raising the glasses a little. When they are about four inches high, transplant them very carefully; and where there are several plants in one pot, part them, preserving a ball of earth to the root of each, and put them into separate small pots filled with light rich earth, which plunge into a hot-bed of tanner's bark, shading them until they have taken new root; after which, fresh air should be admitted to them, in proportion to the warmth of the season. Towards Michaelmas the plants must be removed into the stove, and plunged into the bark-bed, where, during the winter season, they should be kept in a moderate warmth, and gently watered twice a week. In the spring the plants should be shifted into pots a size larger, and the bark-bed should be then renewed with fresh tan, which will set the plants in a growing state. These plants must be constantly kept in the stove, for they are too tender to bear the open air in this country, but in warm weather they should have a large share of fresh air.

13. Laurus Borbonia; *Broad-leaved Carolina Bay*, or *Red Bay*. Leaves oblong-lanceolate, perennial, veined; fruits oblong, immersed in a berried receptacle. In some situations near the sea, this rises with a straight large trunk to a considerable height; but in the inland parts of the country it is of an humbler stature. The leaves are much longer than those of the common Bay, and are a little woolly on their under side. Berries blue, in red cups, growing two and sometimes three together. The wood is finely grained, and of excellent use for cabinets, &c. especially some of the best sorts, which resembles watered satin, and is very beautiful.—They will not live in sharp winters; and should be kept in pots or tubs during the winter.

14. Laurus Exaltata. Leaves ovate-lanceolate, veined, coriaceous, perennial, flat; racemes upright, compound; calix cup-shaped, permanent.—Native of Jamaica.

15. Laurus Triandra. Leaves broad, lanceolate, perennial, flat; flowers three-stamined; fruit covered by the calix.—Native of Jamaica.

16. Laurus Coriacea. Leaves ovate-acuminate, flat, veined, shining, coriaceous; racemes upright, shorter than the leaves.—Native of Jamaica.

17. Laurus Leucoxylon. Leaves oblong-lanceolate, flat, perennial; racemes shorter than the leaves; calices incrassated, warted. It is called *Loblolly*, *White-wood*, or *White Sweet-wood*.—Native of Jamaica.

18. Laurus Membranacea. Leaves oblong, acuminate, veined, convex, coriaceous-membranaceous; branches and racemes upright, shorter than the leaf.—Native of Jamaica.

19. Laurus Patens. Leaves ovate-lanceolate, flat, membranaceous; racemes upright, diffused, longer than the leaves. —Native of Jamaica.

20. Laurus Pendula. Leaves oblong, veined, membranaceous, perennial; racemes loose; fruits pendulous; calices deciduous. It grows twelve feet high.—Native of Jamaica.

21. Laurus Floribunda. Leaves ovate-lanceolate, flat, membranaceous; flowers raceme-panicled, loose, terminating. —Native of Jamaica.

22. Laurus Lucida. Leaves oblong, serrate; branchlets in threes; flowers axillary, solitary, subsessile. This is a smooth tree, with round branches.—Native of Japan.

23. Laurus Umbellata. Leaves ovate, serrate; branchlets umbelled; flowers in racemes. Stem shrubby, very much branched.—Native of Japan.

24. Laurus Æstivalis; *Willow-leaved Bay*. Leaves veined, oblong-acuminate, annual, wrinkled underneath; branches superaxillary. Stalk shrubby, branching, eight to ten feet high; bark purple; flowers white, six-petalled at the top of the branches; followed by green berries inclosed in reddish cups. —Native of swampy lands in North America. It may be propagated by seeds, when they can be procured, and by layers, which put out roots pretty freely. This, and the two following, will live in the open air in England; but the Sassafras is often injured by very severe frosts, especially if it be in an exposed situation; therefore these plants should have a warm situation, and a loose soil; and in moist ground this will thrive much better than in a dry soil.

25. Laurus Benzoin; *Common Benjamin Tree*. Leaves nerveless, ovate, sharp at both ends, entire, annual. It rises to the height of ten or twelve feet, dividing into many branches; flowers of a white herbaceous colour.—Native of Virginia. This tree has been confounded with the true Benzoin tree; for which see *Styrax Benzoin*. It may be propagated by sowing the berries, which generally lie long in the ground, so that, unless they are brought over in earth, they often fail. It may also be increased by layers, which put out roots freely when the young shoots are made choice of.

26. Laurus Sassafras; *Sassafras Tree*. Leaves entire, and three-lobed. This is generally a shrub, about ten feet high, though it sometimes grows into a large tree; leaves of different shapes and sizes, on pretty long footstalks, of a lucid green; flowers three or four on each peduncle, small, yellow, or greenish white; berry blue when ripe. It is said that bedsteads made of the wood will never be infested with bugs; indeed Loureiro remarks, that it is very proper for making cabinets in hot climates, because the smell is disagreeable to insects. It is of a light and spongy texture, has a fragrant smell, and a sweet aromatic taste. Both it and the bark, which in America has been substituted for spice, are much used in the materia medica. Sassafras is used as a mild corroborant, diaphoretic, and sweetener, in scorbutic, venereal, cachectic, and catarrhal disorders. Infusions made in water, from the cortical or woody part rasped or shaved, are commonly drank as a tea: and this, in some constitutions, from its fragrance, is said to affect the head at first, which inconvenience ceases on continuing its use a little time. It is made an ingredient in several diet-drinks, both empirical and such as are used in regular practice. It gives out its virtues both to spirit and water, but most readily to the former. A decoction of Sassafras with sugar was sold in coffee-houses at the end of the last century, under the name of *bochet:* there has been a shop opened for the sale of it in Fleet Street, under the name of *saloop*, for many years past.—Native of sandy soils in America. This tree is commonly propagated by the berries brought over from America. They often lie in the ground a whole year, and sometimes two or three, if sown in spring, before they grow; therefore the surest way of obtaining the plant is, to get the berries put into a tub of earth soon after they are ripe; and as soon as they arrive, sow them on a bed of light earth, putting them two inches in the ground. If the spring be dry, water them often, and shade them from the heat of the sun in the middle of the day. With this management many of the plants will come up the first season; but as a great many of the berries will lie in the ground till the next spring, so the bed should not be disturbed, but wait until the season after, to see what will come up. The first winter after the plants come up, they should be protected from the frost, especially in the preceding autumn, for the first early frost at that season is apt to pinch the shoots of these plants, which when young are tender and full of sap, so will do them more injury than the severe frost of the winter; for when the extreme part of the shoots are killed, it greatly affects the whole plant. When they have grown a year in the seed-bed, they may be transplanted into the nursery, where they may stand one or two years to acquire strength, and may then be transplanted into the places where they are to remain for good. Some of them have been propagated by layers, but they are commonly two and sometimes three years before they put out roots, and will rarely take root at all if they are not duly watered in dry weather. The Sassafras makes a good appearance in summer, when fully clothed with its large leaves, which being of different shapes, make an agreeable variety with shrubs of the same growth.

27. Laurus Involucrata. Leaves obovate; umbels involucred; branches watered by the fallen petioles.—This tree is a native of Tranquebar in the East Indies.

28. Laurus Myrrha; *Myrrh Laurel*. Leaves three-nerved, ovate, with a long point; flowers heaped, sessile, axillary. It is a small tree, five feet high, very much branched, with an unarmed twisted trunk; flowers white. The root is warm, diuretic, emmenagogue, antiputredinous, and anthelminthic. A red oil expressed from the berries, and having the smell and taste of the plant, is used by the Cochin-chinese in the itch, wounds, pustules, and putrid ulcers, and against the worms and insects that attack the human body. The whole plant is extremly bitter, and has the taste and smell of Myrrh to such a degree, that Loureiro suspects that it may be the plant which affords the true Myrrh.—Native of Cochin-china.

29. Laurus Polyadelpha. Leaves obscurely three-nerved, lanceolate; flowers axillary, polyadelphous. This is a large tree, with spreading boughs; flowers reddish-white; corolla cup-shaped.—Native of the mountains of Cochin-china.

30. Laurus Curvifolia. Leaves obscurely three-nerved, oblong, curved inwards; racemes small, subterminating. This also is a large tree, with spreading branches; flowers white.—Native of mountainous woods in Cochin-china.

31. Laurus Cubeba; *White Laurel*. Leaves nerveless, veinless, lanceolate; flowers heaped, peduncled. This is a middle-sized and very branching tree. Corolla white. The berries are globular; they are corroborant, cephalic, stomachic, and carminative. A decoction of them is serviceable in vertigo, hysterics, palsy, &c. The bark has the same qualities, but in an inferior degree. The natives use the

fresh berries as a sauce for fish; the smell is fragrant, the taste aromatic and warm; they have the size, colour, and form of black pepper; and being fastened to a long slender peduncle, are not unaptly called *piper caudatum*, or Tailed Pepper. —Native of Cochin-china; probably also of China.

32. Laurus Pilosa. Leaves nerveless, oblong, hairy; racemes wide, terminating. A large tree with spreading branches; flowers polygamous, greenish-yellow. The wood is yellow, durable, and fit for building and turning.—Native of the mountain-woods in Cochin-china.

Lawsonia; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth four-cleft, small, permanent. *Corolla:* petals four, ovate-lanceolate, flat, spreading. *Stamina:* filamenta eight, filiform, length of the corolla, in twin pairs between the petals; antheræ roundish. *Pistil:* germen roundish; style simple, length of the stamina, permanent; stigma headed. *Pericarp:* capsule or berry globose, with a point, four-celled. *Seeds:* many, cornered, pointed. Essential Character. *Calix:* four-cleft. *Petals:* four. *Stamina:* in four pairs. *Capsule:* four-celled, many-seeded.—The plants of this genus are all propagated by seeds sown on a hot-bed early in the spring, that the plants when they come up may have time to acquire strength before winter. When fit to remove, plant each in a small pot of light sandy earth, and plunge them into a hot-bed of tanner's bark, where they must be screened from the sun until they have taken new root; then treat them as the Coffee-tree, only giving them less water, especially in winter: they are too tender to thrive in the open air, they must therefore constantly remain in the stove, having plenty of air in hot weather.——The species are,

1. Lawsonia Inermis; *Henna*, or *Smooth Lawsonia.* Branches unarmed; leaves subsessile, ovate, sharp at both ends. Stem shrubby, eight or ten feet high; flowers in loose terminating bunches, yellowish-white, with purplish stamina. This is supposed to be the *henna*, or *al-henna*, of the scriptures, translated *camphire* in Solomon's Song, and in other places rendered *cypress* and *myrrh.* The leaves of this shrub are used by the Egyptian women to colour their nails yellow, as an ornament.—Native of India and Egypt.

2. Lawsonia Achronychia. Branches unarmed; leaves on long petioles, wedge-shaped. A smooth shrub, with round branches.—Native of New Caledonia.

3. Lawsonia Spinosa; *Prickly Lawsonia.* Branches spiny. This rises with a woody trunk, about eighteen feet high; wood hard and close, covered with a light gray bark; flowers white, in racemed terminating corymbs; others say of a pale yellow-colour, and disagreeable scent.—Native of the East Indies and Spanish West Indies.

4. Lawsonia Falcata. Leaves sickle-shaped, slightly crenate. This is a shrub or small tree six feet high, very much branched; flowers white, in a racemed terminating corymb.—Native of Cochin-china.

Laxmannia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, compressed, four-toothed, rather acute, inferior, very small. *Corolla:* petals four, linear, feathery, long, upright at the base, spreading, with inflected tip, a villose line on the upper part, two more approximated than the rest. *Stamina:* filamenta six, linear below, upright, awl-shaped at the tip, spreading, rather shorter than the corolla; antheræ roundish, affixed to the back. *Pistil:* germen roundish, extremely villose; style shorter than the stamina, thick, cornered; stigma simple. *Pericarp:* subglobose, tetragonal at the top, four-celled; the cells covered by a membrane. *Seeds:* solitary, oblong, compressed. Essential Character. *Calix:* one-leafed, four-toothed, inferior. *Corolla:* four-petalled. *Berry:* four-celled. *Seeds:* solitary.——The species are,

1. Laxmannia Cuminosma. Fruit globose, slightly depressed; petals twice the length of the calix.—Native of Ceylon.

2. Laxmannia Ankænda. Fruit ovate, pointed; petals many times longer than the calix. A shrub about four feet high, with round leafy branches; flowers greenish-white; berry ovate, pointed, dark green, with an aromatic flavour of Cumin.—Native of Ceylon and Malabar.

Laying of Trees and Shrubs—is thus performed. First: having well dug the ground, and made it very light, take some of the most flexible boughs, and lay them into the ground about half a foot deep, pegging them down with forked sticks if necessary, leaving the end of the layer a foot or a foot and a half out of the ground; keep them moist during the summer season, and they will probably have taken root and be fit to remove in autumn, or, if not, they must remain another season. Secondly: tie a piece of wire hard round the bark of the bough, at the place you intend to lay in the ground, and twist the ends of the wire securely; prick the part above the wire through the bark with an awl in several places, and then lay it in the ground as before directed. This method will often succeed when the other fails. Thirdly: cut a slip upwards at a joint, as is practised in laying Carnations; which gardeners call tonguing the layers. Fourthly: twist the part of the branch designed to lay in the ground like a withy, if it be pliable, and lay it in the ground as directed above. Fifthly: cut the bark all round at a joint, taking out small chips all the way below the cut, and lay that part in the earth.—Though branches may be laid at any time, yet the proper season for laying hardy trees that shed their leaves, is October; for such as are tender, the beginning of March; for evergreens, June or July. When the boughs cannot be bent down into the ground, lay them in baskets, boxes, or pots, filled with fine mould mixed with a little rotten willow dust, and elevated by blocks or tressels. Too much of the head must not be left on; and the smaller the boughs are, the less way they should be left out of the ground. In trees of a hard wood, the young shoots; but in trees of a soft wood, the older boughs will take root best. Many trees and plants will not put out roots from the woody branches, yet if the young shoots of the same year be laid in July, they will often put out roots very freely; but as these shoots will be soft and herbaceous, they must not have too much wet, which would cause them to rot; cover therefore the surface of the ground with moss, which will prevent it from drying too fast, and a little water will suffice. To raise a quantity of trees by layers, the required number should be headed down for stools, within a few inches of the ground, in autumn; and the summer following, they will afford plenty of young shoots proper for laying in the autumn. In many trees, however, it will be better to wait two years; the ground in the mean time may be dug in winter, and constantly hoed as the weeds rise in summer. After the layers are taken up, the stools must have all the wounded parts taken away, and the old branches should be cut off pretty close to the stem; in the spring they will shoot out fresh branches, which may be laid the second year after.

Leadwort. See *Plumbago.*

Leatherwood. See *Dirca.*

Lechea; a genus of the class Triandria, order Trigynia.—Generic Character. *Calix:* perianth three-leaved; leaflets ovate, concave, extremely spreading, permanent. *Corolla:* petals three, linear, narrower than the calix, but

almost longer, concave. *Stamina:* filamenta three, (sometimes four or five,) capillary, longer than the corolla, incumbent on the pistil, equal; antheræ roundish. *Pistil:* germen ovate; style none; stigmas three, feathery, divaricated. *Pericarp:* capsule ovate, three-sided, three-celled (according to Gærtner, one-celled,) three-valved; and also with three internal valves converging towards the exterior ones, constituting partitions. *Seeds:* solitary, ovate, cornered inwards. ESSENTIAL CHARACTER. *Calix:* three-leaved. *Petals:* three, linear. *Capsule:* three-celled, three-valved, with as many internal ones. *Seeds:* solitary.——The species are,

1. Lechea Minor. Leaves linear-lanceolate; flowers panicled. Root fibrous, perennial, putting up several upright simple stems, panicled at top, and round.—Native of North America, in Virginia and Canada.

2. Lechea Major. Leaves ovate-lanceolate; flowers lateral, wandering. Stem purplish, round, with simple, alternate, remote branches. Stamina four, the two upper ones approximating.—Native of North America, in Virginia and Canada.

3. Lechea Racemulosa. Leaves linear, acute, ciliate; panicles slender, very branchy, pyramidal; flowers small, alternate, pedicelled; stalk erect.—It grows in sandy fields from New Jersey to Carolina.

4. Lechea Thymifolia. Leaves linear, acute; panicles leafy, elongated; branches short; flowers fasciculate, lateral and terminal; pedicels very short; flowers small, hoary-tomentose; stalk erect; the lower branches, which in most species of this genus trail on the ground, have a great resemblance to Thymus Serpyllum.—Found on slate hills, and in the dry barren woods of Virginia, in North America.

5. Lechea Tenuifolia. Leaves very narrow; panicles divaricated; branchlets alternate; pedicels elongated, divaricated; stalk erect. The lower branches in this species have linear leaves, by which it is easily distinguished from the rest. The whole plant is very hairy.—Found on dry gravelly hills from Virginia to Georgia.

6. Lechea Verticillata. Leaves elliptical, serrated; flowers whorled. Stems several, spreading, or decumbent, a span long.—Sent by Dr. Ruttler from Madras.

7. Lechea Chinensis. Leaves ovate-lanceolate; spathes three-flowered, terminating; stem annual, manifold, creeping, short; flowers from a large blunt spathe; petals blue, with claws.—Native of China near Canton.

Lechenaultia; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. Calix, superior; tube of the corolla slit longitudinally on one side; antheræ cohering; pollen of compound grains; stigma obsolete, in the bottom of a two-lipped cover; capsule prismatic, of two cells and four opposite valves with central partitions; seeds cubical or cylindrical, shelly.—(*Brown.*)——The following species are all natives of New Holland.

* *Small shrubs with heath-like leaves; flowers axillary or terminal; capsule valvular; seeds cubical.*

1. Lechenaultia Formosa. Flowers axillary, solitary, drooping, without bractes; corolla smooth, two-lipped.——2. Lechenaultia Tubiflora. Flowers nearly terminal, solitary, slightly stalked; corolla tubular, curved, with a closed limb; leaves awl-shaped, with a small pellucid point.——3. Lechenaultia Expansa. Corymbs axillary, of few flowers; stalks with a pair of bractes each; corolla with one lip, in fringed segments.

** *Herbaceous. Flowers opposite to a leaf; capsule opening only when far advanced, its valves cohering by a narrow neck; seeds cylindrical.*

4. Lechenaultia Filiformis. Leaves alternate, thread-shaped, somewhat compressed.

Lecythis; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth six-leaved; leaflets roundish, concave, permanent. *Corolla:* petals six, oblong, obtuse, flat, very large, of which the two upper ones are very spreading; nectary petal-form, one-leafed, tongue-shaped, flat at the base, perforated for the germen, marginated; a strap bent upwards from the lower side of the flower, linear, outwardly convex, thick at the tip, ovate, together with the stamina covering the organs. *Stamina:* filamenta extremely plentiful, inserted on every side into the interior disk of the base of the nectary, very short, thicker above; antheræ oblong, small. *Pistil:* germen depressed, acuminated, girt with the receptacle of the flower; style very short; stigma rather obtuse, conic. *Pericarp:* rounded at the base, woody, girt above by the rudiments of the calix, truncated, subquadrilocular, circumcised, with orbiculated operculum. *Seeds:* several, glossy, with rough margin. ESSENTIAL CHARACTER. *Calix:* six-leaved. *Corolla:* six-petalled. *Nectary:* ligulate, staminiferous. *Pericarp:* circumcised, many-seeded.——The species are,

1. Lecythis Grandiflora. Leaves ovate; peduncles of the flowers thick. This tree grows to the height of thirty feet; flowers at the end of the shoots from the axils of the leaves, and also from the branches and shoots themselves; corolla rose-coloured; two petals longer and wider, and four smaller. The kernels of the capsule are very good to eat. The Caribs call it *canari makaque;* and the French, *marmite de singe,* the ape's porridge-pot. It flowers in January, and fruits in April.—Native of the forests of Guiana.

2. Lecythis Amara. Leaves ovate-lanceolate, acuminate; fruit small, with a bitter kernel. This is also a very lofty tree; flowers small, yellow; capsule the size of an egg, hard, woody, formed like a little oval pot; the bitter kernels of which are eaten by monkeys. The Creoles call it *petite marmite de singe.*—Native of Guiana.

3. Lecythis Parviflora. Leaves ovate-lanceolate, acuminate; fruit small, two-celled; lid with the appendix woody, produced inwards. This is not very lofty; the boughs and twigs bend towards the ground; flowers of a golden yellow colour, and smelling very sweet. The bitter kernel is only eaten by monkeys.—Native of Guiana, on the banks of rivers.

4. Lecythis Jacapucaya. Leaves lanceolate-oblong, acuminate; fruit large, with an eatable kernel. It is a very lofty tree, the trunk sixty feet high or more, and upwards of two feet in diameter; the bark is rough and irregular, and the wood white, except towards the middle, where it is red; the boughs extend every way, and are loaded with leaves ten inches long and two and a half wide; flowers at the extremity of the shoots, in pendent racemes; the corolla consists of six unequal petals, white, with rose-coloured edges; nectary rose-coloured; capsule thick, hard, woody, oval, rounded at bottom, convex at top, with a point in the middle, which is the remains of the style; it is four inches in diameter, and five or six inches high. The Portuguese turn boxes and other toys out of these capsules; the kernels of which are eaten, and are sweet, delicate, and preferable to almonds; they are sold in London under the name of Brazil nuts. Birds and monkeys feed much upon them. The Brazilians extract an oil from the kernels, which is much esteemed; and the Indians use the bark for making cordage, and as oakum for stopping the seams of boats. The wood being hard and durable, is excellent for mill-work.—Native of America, Brazil, and Guiana.

5. Lecythis Idatimon. Leaves ovate-lanceolate, acuminate; fruit small, four-celled. It resembles the preceding in height and leaves; flowers axillary, at the ends of the shoots;

corolla rose-coloured; capsule an inch in diameter, woody; kernel bitter.—Native of the forests of Guiana.

6. Lecythis Minor. Leaves lanceolate-oblong, petioled. This is an elegant branching upright tree, sixty feet high; flowers large; corolla and nectary white; fruit very hard, brown, two inches in diameter; the cover falls off when the fruit is ripe; the dried pulp and seeds follow; but the pot or body of the capsule hangs on frequently two years in an inverted state. Jacquin relates, that, having eaten a whole nut, he was seized with a nausea in half an hour after, accompanied with a giddiness of the head. The fruits are ripe in December.—Native of woods about Carthagena, in New Spain, flowering in June and July.

Ledum; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, very small, five-toothed. *Corolla:* one-petalled, flat, five-parted; divisions ovate, concave, rounded. *Stamina:* filamenta ten, filiform, spreading, length of the corolla; antheræ oblong. *Pistil:* germen roundish; style filiform, length of the stamina; stigma obtuse. *Pericarp:* capsule roundish, five-celled, gaping five ways at the base. *Seeds:* numerous, oblong, narrow, sharp on each side, extremely slender. Essential Character. *Calix:* five-cleft. *Corolla:* flat, five-parted. *Capsule:* five-celled, gaping at the base. All these plants grow on mosses and bogs, where their roots spread freely; and therefore cannot be preserved in a thriving state in gardens, except in similar soil and shady situation. They must be procured from the places of their growth, and taken up with good roots, planted on a border of bog earth, and frequently watered.——The species are,

1. Ledum Palustre; *Marsh Ledum*, or *Cistus.* Leaves linear, rolled back at the edge, tomentose underneath. Root branched, running widely and deeply into the ground; stems shrubby, slender, three or four feet long; leaves resembling those of Rosemary, but wider; flowers on peduncles, an inch or more in length, whitish, in axillary bundles; seeds very numerous, like saw-dust. It flowers here in April and May. —Native of the north of Europe.

2. Ledum Latifolium; *Broad-leaved Ledum*, or *Labrador Tea.* Leaves oblong, rolled back at the edge, tomentose underneath; flowers subpentandrous. This shrub grows three or four feet high; trunk as thick as a man's finger; flowers very like those of the preceding. It flowers here in April and May. Bees are very fond of the flowers of these plants. Animals do not browse on them, and they are reputed in some degree poisonous; but are notwithstanding put into beer, in order to inebriate; the smoke of them destroys bugs and other insects; and the Russians are said to use them in tanning leather. A decoction of them is given in the itch.—Native of Greenland, Hudson's Bay, Labrador, Newfoundland, and Nova Scotia.

3. Ledum Buxifolium; *Box-leaved Ledum.* Leaves ovate-oblong, flat, smooth. This is a small shrub scarcely a foot high; stem upright, roundish, rugged with scars, ash-coloured; branches at stated intervals in a sort of whorl, leafy, or scarred, each subdivided and upright; corolla white. —Native of New Jersey and Carolina.

Leea; a genus of the class Pentandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, bell-shaped, coriaceous, five-toothed, permanent. *Corolla:* one-petalled; tube the length of the calix; border five-cleft; divisions ovate, acute; nectary placed on the tube of the corolla, and shorter than it, upright, pitcher-shaped, five-cleft; lobes emarginate. *Stamina:* filamenta five, inserted below, within the nectary, between the lobes, incurved; antheræ ovate, versatile, before impregnation converging and covering the stigma. *Pistil:* germen subglobose, superior; style simple, shorter than the nectary; stigma headed. *Pericarp:* berry orbiculate, depressed, quinque-torulose, one-celled. *Seeds:* five, on one side gibbose, on the other cornered. Essential Character. *Corolla:* one-petalled. *Nectary:* on the tube of the corolla, upright, five-cleft. *Berry:* five-seeded.——The species are,

1. Leea Sambucina; *Elder-leaved Leea.* Stem, peduncles, and leaves, smooth. This is a small tree, resembling the Elder; berry marked with from three to six swellings, black, aromatic, containing from three to six seeds.—Native of the East Indies, Africa, and New South Wales.

2. Leea Æquata; *Shrubby Leea.* Leaves smooth; stem and peduncles scurfy; corymbs trichotomous.—Native of the East Indies.

3. Leea Crispa; *Fringe-leaved Leea.* Stem angular, fringed, curled. Root tuberous; stem somewhat woody, but annual, three feet high; flowers snowy white, very small.—Native of the Cape, and the East Indies.

Leeks. See *Allium Porrum.*

Leersia; a genus of the class Triandria, order Digynia. —Generic Character. *Calix:* none. *Corolla:* glume bivalve; valves navicular, concave, compressed, ciliate, prickly on the back, nearly equal; the exterior larger, oblong, mucronated; the interior twice as narrow, linear, acute. Nectary two-leaved; leaflets lanceolate, acute. *Stamina:* filamenta three, (in some cases one to six) capillary, shorter than the corolla; antheræ oblong. *Pistil:* germen ovate, compressed; styles two, capillary, short; stigmas feathered. *Pericarp:* none; the corolla includes the seed. *Seeds:* single, obovate, compressed. Essential Character. *Calix:* none. *Glume:* two-valved, closed.—— The species are,

1. Leersia Monandra. Panicle spreading; spikes remote, loose; spikelets directed all one way, roundish, one-stamined; glumes even.—Native of Jamaica.

2. Leersia Hexandra. Panicle spreading; spikelets alternate, six-stamined; glumes almost even.—Native of Jamaica.

3. Leersia Oryzoides. Panicle spreading; spikelets three-stamined; keel of the glumes ciliate. This is a tall grass, more than two feet high, with rough leaves, and upright, stiff, branching panicle; the pedicels are flexuose; and the flowers white with green lines.—Native of the marshes of Virginia; introduced into Italy along with Rice; found also in Switzerland, the Palatinate, and Persia.

4. Leersia Lenticularis. Panicles with subsolitary branches; spikelets imbricated; glumes orbiculated, ciliated. This singular and elegant grass, Pursh informs us, he found on the island of Roanoak, in North Carolina, and observed it catching flies in the same manner as *Dionæa Muscipula*, (which see) to the leaves of which plant, the valves of the corolla bear a great resemblance.—It grows in the wet gravelly woods of Illinois and Virginia.

Legnotis; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, half four or five cleft, permanent; divisions ovate, acute, upright. *Corolla:* petals four or five, longer than the calix; claws slender, almost the length of the calix, inserted into the receptacle; borders ovate, fringed with a great many villose divisions. *Stamina:* filamenta sixteen, twenty, or more, as far as fifty, filiform, equal, length of the calix, inserted into the receptacle; antheræ oblong, upright. *Pistil:* germen roundish; style cylindric, length of the stamina; stigma headed. *Pericarp:* capsule large, three-cornered, three-celled, three-valved, elastic. *Seed:* solitary, on one side convex, on the other cornered. *Observe.*

The number of parts of the fruit is sometimes increased by a fourth. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Petals:* five, jagged, inserted into the receptacle. *Capsules:* three-celled.——The species are,

1. Legnotis Elliptica. Leaves elliptic; flowers pedicelled. —Native of Jamaica.

2. Legnotis Cassipourea. Leaves ovate; flowers sessile. This is a middle-sized tree; the trunk five feet or more in height, branchy at top; bark gray; flowers axillary; petals white.—Native of Guiana, where it flowers in January.

Lemna; a genus of the class Monœcia, order Diandria. —GENERIC CHARACTER. *Male Flower. Calix:* one-leafed, roundish, gaping on the side, obliquely dilated outwards, obtuse, spreading, depressed, large, entire. *Corolla:* none. *Stamina:* filamenta two, awl-shaped, incurved, length of the calix; antheræ twin, globose. *Pistil:* germen ovate; style short, permanent; stigma obscure. *Pericarp:* abortient. *Female Flower,* in the same plant with the male. *Calix:* as in the male. *Corolla:* none. *Pistil:* germen subovate; style short, permanent; stigma simple. *Pericarp:* capsule globose, with a point, one-celled. *Seed:* some, oblong, sharp at each side, nearly the length of the capsule, striated on one side. ESSENTIAL CHARACTER. *Male. Calix:* one-leafed. *Corolla:* none. *Female. Calix:* one-leafed. *Corolla:* none. *Style:* one. *Capsule:* one-celled.—These plants are all annual, and float on stagnant water. They were long thought by some to be cryptogamous plants; but their fructifications are now well ascertained.——The species are,

1. Lemna Trisulca; *Ivy-leaved Duck's-meat.* Leaves petioled, lanceolate; stem dichotomous, filiform, flatted, proliferous. It flowers from June to September.—Native of most parts of Europe, in ditches and stagnant waters.

2. Lemna Minor; *Least Duck's-meat,* or *Duckweed.* Leaves sessile, flattish on both sides; roots solitary. The leaves are very small, collect into heaps by twos and threes, and form extensive green plats on stagnant waters, covering the ditches. Each leaf drops a single radicle. This plant affords nourishment not only to ducks, but to the Fresh-water Polype, the Phalæna Lemnata, &c. Its quick and extensive propagation make it troublesome in some cases; but it should always be borne in mind that it has been proved to arrest a vast quantity of inflammable air from putrid water, which it converts into vital elastic air fit for respiration. Hill says that the juice of this plant, taken in a dose of four or five drops upon sugar, works powerfully by urine, and opens obstructions of the liver; jaundice is said to have been cured by it alone.—It flowers from June to September; Linneus says, in the dog-days; and is common in most parts of Europe.

3. Lemna Gibba; *Gibbous Duck's-meat,* or *Duckweed.* Leaves sessile, hemispherical underneath; roots solitary. The leaves are generally tinged with purple, the upper surface very convex and white. It flowers in July and August.—Native of several parts of Europe, in ditches and ponds.

4. Lemna Polyrhiza; *Greater Duck's-meat,* or *Duckweed.* Leaves sessile; roots clustered. The leaves are much larger than those of the common sort; they are thick, succulent, and inflated. Linneus says it floats on the surface of the water on the appearance of the swallows, and sinks again at their disappearance. All the species sink in the winter, and rise again in the spring. It flowers in July and August.—Native of most parts of Europe, in ditches and ponds.

5. Lemna Obcordata. Leaves sessile, obcordate; roots clustered.—Native of the East Indies.

6. Lemna Arhiza. Leaves in pairs, rootless. This minute species is not bigger than an ordinary pin's head.—Native of the East Indies.

Lemniscia; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-toothed, acute, short. *Corolla:* petals five, linear, long, acute, recurved, growing to the nectary; nectary cup-shaped, fleshy, very short, girding the germen. *Stamina:* filamenta numerous, (seventy to eighty,) capillary, longer than the corolla, inserted into the nectary; antheræ roundish, small. *Pistil:* germen roundish, immersed into the nectary; style filiform, length of the stamina; stigma obtuse. *Pericarp:* capsule five-celled. *Seeds:* solitary. ESSENTIAL CHARACTER. *Calix:* five-toothed. *Corolla:* five-petalled, recurved. *Nectary:* cup-shaped, girding the germen. *Pericarp:* five-celled. *Seeds:* solitary.——The only known species is,

1. Lemniscia Guianensis. The trunk rises from fifteen to twenty feet high, by a foot in diameter. Abundance of twisted branches spread in every direction: leaves alternate, smooth, firm, entire, ovate, acuminate, on a short petiole; the largest are five inches in length, and two in breadth; flowers at the ends of the shoots, very numerous, in large corymbs, on a woody peduncle; corolla of a fine coral red. The wood is white and compact. It flowers in August.—Native of Guiana, where it is called *jouantan.*

Lemon Tree. See *Citrus.*

Lentil. See *Ervum.*

Leontice; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth six-leaved, caducous; leaflets linear, expanding, the alternate ones smaller. *Corolla:* petals six, ovate, twice the length of the calix; nectary of six scales, which are semi-ovate, spreading, foot-stalked, inserted into the claws of the petals; equal. *Stamina:* filamenta six, filiform, very short; antheræ upright, two-celled, two-valved, gaping at the base. *Pistil:* germen oblong-ovate; style short, somewhat columnar, obliquely inserted into the germen; stigma simple. *Pericarp:* berry hollow, globose-acuminate, inflated, one-celled, subsucculent. *Seeds:* few, globose. ESSENTIAL CHARACTER. *Calix:* six-leaved, deciduous. *Corolla:* six-petalled. *Nectary:* six-leaved, placed on the claws of the corolla, spreading.—— The species are,

1. Leontice Chrysogonum; *Pinnated Lion's Leaf.* Leaves pinnate; common petiole simple. Both this and the next species have large tuberous roots about the size of those of Cyclamen, covered with a dark brown bark. The flowers of both also are upon naked peduncles; in the first yellow, in the second smaller and paler.—Native of the islands of the Archipelago, and of the corn-fields about Aleppo; flowering at Christmas. They seldom flower here till the beginning of April, and do not produce seeds in our climate. To propagate them, the seeds should be procured from abroad in sand, and sown as soon as they arrive, and covered with glasses in winter. In spring, after the plants appear, let them have free air in mild weather. If they are not too close, let them remain unremoved till the second year; but where they are very close, take up a part of the roots in October, and plant them close to a warm wall. In November lay some old tanner's bark over the surface, three or four inches thick; remove this in March, before the roots begin to push, leaving a thin covering to prevent the spring winds from drying the ground. These roots should have a dry loose soil, and must be seldom removed. October is the best time for removing them. These, like most other tender bulbs, do best in a south border, in front of a green-house or stove covered with glasses. They are very difficult to preserve, for the roots will not thrive in pots; and in the full ground, the frost frequently destroys them in winter, especially when young.

2. Leontice Leontopetalum; *Common Lion's Leaf.* Leaves decompound; common petiole trifid. For further particulars, propagation, and culture, see the preceding species.—Native of the Levant, Tuscany, and Apulia.

3. Leontice Thalictroides; *Columbine-leaved Lion's Leaf.* Stem-leaf triternate; floral-leaf biternate; stem simple.—Native of North America. See the first species.

4. Leontice Triphylla; *Three-leaved Lion's Leaf.* Leaves radical, ternate, bluntly toothed; stalk radical, simple; flowers spiked. Perennial.—Gathered by Mr. Menzies on the West coast of N. America.

Leontodon; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common imbricate, oblong; scales, interior linear, parallel, equal; exterior, fewer, often reflex at the base. *Corolla:* compound imbricate, uniform; corollets hermaphrodite, numerous, equal; proper one-petalled, strap-shaped, linear, truncated, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* germen subovate; style filiform, length of the corollet; stigmas two, revolute. *Pericarp:* none. *Calix:* oblong, straight, at length reflex. *Seeds:* solitary, oblong, rough; down capillary, foot-stalked. *Receptacle:* naked, dotted. Essential Character. *Calix:* imbricate, with loosish scales. *Down:* capillary. *Receptacle:* naked, dotted. Most of the species that have been ranged by Linneus under this genus, have been separated by subsequent authors, on account of a difference in the calix, down, and receptacle. Perhaps none of the species ought to have remained under this genus except the first. The following are the generic characters of the three genera into which this has been divided. 1. Apargia. *Calix:* subimbricate, with linear, parallel, unequal scales. Down plumose, subsessile. Receptacle, naked, subvillose. 2. Hedypnois. *Calix:* calicled, with short scales. Down, none to the outer seeds; the inner have five almost erect awned chaffs. Receptacle, naked. 3. Leontodon. Calix, imbricate with loosish scales. Down, capillary. Receptacle, naked, dotted.——The species are,

1. Leontodon Taraxacum; *Common Dandelion.* Lower calicine scales reflex; leaves runcinate, toothletted, even. Root perennial, tapering, milky, pale brown. In a very dry situation, the leaves vary from pinnatifid or deeply runcinate to nearly entire; in a very moist one, generally smooth, but sometimes a little rough. A single large yellow flower is supported on a hollow milky scape, covered with a kind of down towards the top. The flowers expand about five or six in the morning, and close early in the afternoon. Early in the spring, while the leaves are hardly unfolded, they are not an unpleasant ingredient in salads, and are said to be a powerful antiscorbutic. The French eat the roots, and the leaves blanched, with bread and butter. At Gottingen the roots are roasted and substituted for coffee by the poor, who find that an infusion prepared in this way can hardly be distinguished from that of the coffee-berry. A strong decoction is found serviceable in the stone and gravel; whence it has, on account of its powerful diuretic effects, obtained the vulgar name of *Piss-a-bed* among most European nations, as well as the English. The expressed juice has been given to the quantity of four ounces, three or four times a day; and Boerhaave had a great opinion of the utility of this and other milky plants in visceral obstructions. When a swarm of locusts had destroyed the harvest in the island of Minorca, many of the inhabitants subsisted upon this plant. Goats eat it; swine devour it greedily; sheep and cattle are not fond of it; horses refuse it; but small birds are fond of the seeds. Our common name is well known to be a corruption of the French *Dent de Lion*, from the toothing of the leaves.—It is a common weed in gardens, flowers from April to September, and is common all over Europe, in meadows, on walls, dry banks, &c. Leontodon Palustris is probably a mere variety.

2. Leontodon Bulbosum; *Bulbous Dandelion.* Leaves oblong-ovate, somewhat toothed, smooth; calix even; scape rough-haired at top, Root tuberous.—Native of Montpellier in the south of France, and of Italy.

3. Leontodon Aureum; *Golden Dandelion.* Leaves runcinate; stem one-leafed; calix hispid. Root perennial, endbitten, the thickness of a reed or of the human finger, with long white fibres, white on the inside, bnt usually blackish without; scape, one or two, round, striated, upright, smooth below, but hispid towards the top, with black hairs, and having a small scale or two at different heights; it is from three to ten inches high, and has one flower at the top; sometimes there is a branch with a second flower. The flower is elegant, each floret being yellow on the inside, but saffron-coloured on the outside, both colours turning deeper.—Native of Switzerland, Austria, and Italy.

4. Leontodon Muricatum; *Prickly Dandelion.* Leaves runcinate, rugged; calices muricated, imbricate, loose, somewhat reclining. Root perennial, fusiform, almost simple; stems diffused, a foot and half high, branched, round, flexuose, somewhat striated, muricated, milky, red; flowers yellow, two inches in diameter. The whole plant is rugged and milky.—Native of the coast of the Mediterranean, near Tunis and Algiers.

Leonurus; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, cylindric-cornered, pentagonal, five-toothed, permanent. *Corolla:* one-petalled, ringent; tube narrow; border gaping; mouth long; upper lip longest, semicylindric, concave, gibbose, rounded, obtuse at the tip, entire, villose; lower lip reflex, three-parted; divisions lanceolate, about equal. *Stamina:* filamenta four, covered beneath the upper lip, of which two are shorter; antheræ oblong, compressed, bifid in the middle, incumbent, sprinkled with very small elevated, globose, glossy, solid points. *Pistil:* germina four; style filiform, of the length and situation of the stamina; stigma bifid, acute. *Pericarp:* none; calix unchanged, containing the seeds, which are shorter than it. *Seeds:* four, oblong, convex on one side, cornered on the other. Essential Character. *Antheræ:* having shining dots sprinkled over them.——The species are,

1. Leonurus Cardiaca; *Common Motherwort.* Stem-leaves lanceolate, trifid. The root seems to be perennial, though most authors mark it as biennial; stem upright, hard, from two to three feet high; leaves somewhat like those of the Gooseberry; whorls of flowers numerous; corolla whitish on the outside, elegantly stained with paler and darker purple within. The herb is bitter and tonic, with no very pleasant, though pungent smell. The whole plant may be used dried, but the tops are best fresh cut. It is a good medicine in hysteric disorders, and promotes the menstrual discharges; it is likewise an excellent thing for palpitations of the heart, when they arise from hysteric causes. The best way of giving it is in form of a conserve, made from the young tops; or it may be given in decoctions, or a strong infusion, but is very unpleasant to take that way. It cleanses the breast from tough phlegm, kills worms in the stomach and intestines, and helps in the cramp and other convulsive disorders. The Germans call this plant, *herzgespaum* or *herzkraut;* the Danes, *hiertespan;* the Swedes, *bonassla;* the French, *agripaume, cardiaque, la cordiale;* the Italians, Spaniards, and Portuguese, *agripalma* and *cardiaca.*—Native of many

parts of Europe, on banks or under hedges, in a gravelly or calcareous soil. It has been observed near Combe Wood in Surry, and in Oxfordshire, Cambridgeshire, Norfolk, Suffolk, and Monmouthshire.—This and the following species, when once planted in a garden, will soon multiply, especially if the seeds be permitted to scatter. The roots will continue for many years.

2. Leonurus Crispus; *Curled Motherwort.* All the leaves acutely serrate, very much wrinkled, unequally reflex at the edge; stem-leaves five-lobed. Stems several, from two to three feet high, upright; branches scarcely any at bottom, but decussately opposite at top, slender, the length of a foot or more; whorls very numerous, terminating, distant, composed of many axillary flowers, heaped together in four divisions; flowers sessile, white. This is very nearly allied to the preceding species; which see. Biennial.—Native of Switzerland and the south of France.

3. Leonurus Marrubiastrum; *Small-flowered Motherwort.* Leaves ovate and lanceolate, serrate; calices sessile, spiny. From a branched fibrous, whitish root, a stem rises three feet high, and almost twice as high in gardens, upright, leafy, branched; corolla flesh or saffron coloured. It flowers from July to August.—It is found in Austria, Hungary, Bohemia, Germany, Piedmont, the Ukraine, on the eastern coast of Africa, in Zanguebar, and even in the island of Java. The seeds of this, and the two following species, should be sown in the spring, upon a bed of common earth, and require no other care but to keep them clean from weeds, and thin them where they are too close. In autumn they may be transplanted where they are designed to flower and seed.

4. Leonurus Tataricus; *Tartarian Motherwort.* Leaves three-parted, jagged; calices villose. Corolla flesh-colour. Mr. Miller says there are two distinct varieties, one with smooth stalks and leaves, and the other very hairy.—It is a biennial plant, native of Russia; and Gmelin says, growing all over Siberia.

5. Leonurus Sibiricus; *Siberian Motherwort.* Leaves three-parted, multifid-linear, bluntish. Stems several, from eighteen inches to about a yard in height, tinged with purple; branches seldom more than two or three pairs; flowers in close whorls; corolla red. Gmelin asserts that it is a mere variety of the preceding, with much larger flowers, and the upper lip almost equal to the lower.—Native of Siberia and China.

Leopard's Bane. See *Doronicum.*

Lepidium; a genus of the class Tetradynamia, order Siliculosa.—Generic Character. *Calix:* perianth four-leaved; leaflets ovate, concave, deciduous. *Corolla:* four-petalled, cross-shaped; petals obovate, twice the length of the calix, with narrow claws. *Stamina:* filamenta six, awl-shaped, length of the calix, the two opposite ones shorter; antheræ simple. *Pistil:* germen heart-shaped; style simple, length of the stamina; stigma obtuse. *Pericarp:* silicle heart-shaped, emarginate, compressed, sharp on the margin, two-celled; valves navicular, keeled, opposite the lanceolate dissepiment. *Seeds:* some ovate-acuminate, narrower at the base, nodding. Essential Character. *Silicle:* emarginate, cordate, many-seeded; valves keeled, contrary. If the seeds of the annual sorts be sown in autumn, the plants will appear in April, May, and June, and the seeds will ripen a month after. If these be permitted to scatter, the plants will come up in autumn; and require no other care but to thin and weed them. The perennial sorts are easily propagated, for every piece of root will grow and multiply wherever it is planted, and will be difficult to root out of a garden when once established.——The species are,

1. Lepidium Perfoliatum; *Various-leaved Pepperwort.* Stem-leaves pinnate-multifid; branch-leaves cordate, embracing, entire. Root annual; stem about a foot high, round, upright, smooth, tinged with purple, dividing into many slender branches; from the ends of which hang the flowers in long loose spikes; they are small and compressed, and appear in July; petals yellow.—Native of Austria, &c.

2. Lepidium Vesicarium; *Bladdery Pepperwort.* Joints of the stem inflated; flowers white. Stem two or three feet high, remarkably inflated at the joints; leaves pinnate, with long narrow leaflets. Annual.—Native of Iberia and Media, in dry places, and flowers there in July.

3. Lepidium Nudicaule; *Naked Pepperwort.* Scape naked, quite simple; flowers four-stamined; leaves pinnatifid. Annual.—Native of Spain and the south of France.

4. Lepidium Procumbens; *Prostrate Pepperwort.* Leaves sinnate-pinnatifid, the outmost larger; scape naked; stems prostrate, racemiferous. Petals wedge-shaped, white. Annual.—Native of the South of France, and the county of Nice.

5. Lepidium Alpinum; *Alpine Pepperwort.* Leaves pinnate, quite entire; scape subradicate; silicles lanceolate, mucronate. Root perennial, slender. The whole plant is very smooth, and has the same taste with cress; flowers tetrandrous; petals milk white, quite entire, wide.—Native of the Alps, of Germany, Switzerland, and Italy. It flowers from April to June, and in the Alps from May to August.

6. Lepidium Petræum; *Rock Pepperwort.* Leaves pinnate, quite entire; petals emarginate, smaller than the calix. Root biennial, taper, and fibrous; stem much and alternately branched; leaves dark green, elegantly pinnate, with an odd lobe; flowers in a close corymb, gradually lengthening out into a spike, very minute, erect; silicle exactly oval, flat. It flowers in March and April.—Native of Oeland, Austria, Switzerland, Dauphiny, Silesia, England; and, according to Loureiro, of China. With us it is found on St. Vincent's Rocks, and on the walls near Bristol; at Uphill in Somersetshire; near Pembroke, &c.

7. Lepidium Cardamines. Root-leaves pinnate; stem-leaves lyrate. Stems a span high, branched.—Native of Spain, by way-sides, in a dry clay soil.

8. Lepidium Spinosum; *Prickly Pepperwort.* Leaves pinnate; leaflets lunate, the outer elongated; branches mucronate. Stem a span high, stiffish, thickish, awl-shaped, branched at bottom; branches awl-shaped, quite simple, siff, spiny at the end; flowers scattered, white, on a very short stiff peduncle. Annual.—Native of the Levant.

9. Lepidium Sativum; *Garden* or *Common Cress.* Flowers tetradynamous; leaves oblong, multifid; root annual, white, fusiform, slender. Stem upright, round, smooth, from a foot to two feet in height, branched at top; both stem and branches terminated by loose narrow spikes of small flowers, which have white petals; silicle roundish, without any style; seeds small, rufescent, ovate, marked with lines, having a sharp taste like Mustard. Of this plant, so much used in winter and spring salads, there are several varieties; one with broad leaves, another with curled leaves, and the common sort. The young plant, though inferior to *Scurvy Grass,* (see Cochlearia Officinalis,) may, however, be of some use as a diuretic and antiscorbutic, if taken largely.—The seeds are sown in pretty close drills during the winter on moderate hot-beds. in spring and autumn on borders, and are soon fit for use. It should be cut young, otherwise it will be too rank.

10. Lepidium Lyratum. Leaves lyrate, curled. Stalks a foot high, dividing into a great number of slender branches, having small oblong leaves on them, which are cut on their sides, and a little curled on their edges. The stalks and

leaves are of a gray colour, inclining towards hoariness. The flowers, which are very small and white, appear in July.—It is biennial; native of Spain and the Levant.

11. Lepidium Latifolium; *Broad-leaved Pepperwort, Poor Man's Pepper*, or *Dittander*. Leaves ovate-lanceolate, entire, serrate. Root perennial, long, branching, spreading very far; stems erect, a yard high or more, alternately branched, leafy, round, smooth, frequently flexuose, panicled at top, with numerous branches of small white flowers, in little corymbs. The young leaves are sometimes eaten in salads; they have a pungent acrid taste. This plant is one of the ancient antiscorbutics, and was formerly used instead of Horse-radish. An infusion of the whole plant vomits; but an infusion of the fresh-gathered leaves is a good diuretic, and cleanses the kidneys and bladder from gravel; it likewise promotes the menses, and the necessary evacuations after delivery. The leaves chewed in the mouth, excite a discharge of watery humours from the head, and cure the tooth-ache. As the leaves possess a hot biting taste like pepper, instead of which they have been often used by the country people, it has obtained the name of Poor Man's Pepper.—It is a native of several parts of Europe. In England it is found at Hythe near Colchester; Haybride near Malden; in the marshes near Grays, and other parts of Essex; below Sheringham cliffs in Norfolk; between Beningborough and Mitton in the North Riding of Yorkshire; plentifully near Seaton; about the castle of Weems: and in Fifeshire. It flowers in July.

12. Lepidium Oleraceum; *Notch-leaved Pepperwort.* Leaves elliptic-oblong, acute, serrate; flowers four-stamined, white, two lines in diameter. Stem perennial, herbaceous, round, from upright ascending, with panicled branches, from a foot to a yard in height. This plant, with Apium or Smallage and Tetragonia Halimifolia, was of considerable service to the ships' crews of the lamented Captain Cook, when they lay in Charlotte Sound; of which place, and of New Zealand, it is a native.

13. Lepidium Subulatum; *Awl-leaved Pepperwort.* Leaves awl-shaped, undivided, scattered; stem suffruticose. Root perennial; petals white; racemes terminating, simple.—Native of Spain. This may be increased by seeds or cuttings.

14. Lepidium Graminifolium; *Grass-leaved Pepperwort.* Leaves linear, the upper ones quite entire; stem panicled, wandlike; flowers six-stamined, small, white. Root perennial.—Native of the south of Europe.

15. Lepidium Suffruticosum; *Shrubby Pepperwort.* Leaves lanceolate-linear, slender, quite entire; stem suffruticose, two feet high; corymbs small, white. Native of Spain.

16. Lepidium Didymum; *Procumbent Pepperwort.* Flowers two-stamined; leaves pinnatifid; fruits twin. Root annual, small, fibrous; stems procumbent, hairy, alternately branched, leafy, a foot long; flowers very small, with two or four stamina; silicle very distinctly two-lobed, rugged. This plant escaped Ray and Dillenius. Hudson mentions it as a native of Devonshire and Cornwall, among rubbish; near Exeter, Truro, and Penryn; and at Dale near the entrance of Milford Haven. It flowers in July.

17. Lepidium Ruderale; *Narrow-leaved Pepperwort.* Flowers two-stamined, apetalous; root-leaves tooth-pinnate; branch-leaves linear, quite entire. Root annual, or biennial, long, fibrous; stem a foot high, usually crooked, woody, stiff, branched; leaves fleshy, smooth; peduncles slender; flowers white, very small, in clustered spikes or racemes; calices pale yellow; silicles numerous, small, much compressed; seed one in each cell. This plan thas a pungent taste, and a fetid smell like the fox. It flowers in June and July.—Native of most parts of Europe in waste places, especially near the sea-coast; at Maldon in Essex; Wisbeach in Cambridgeshire; near Yarmouth, Lynn, and Clay, in Norfolk; by the Severn above Worcester; near King's Weston below Bristol; near Truro in Cornwall; and upon the coast of Scotland.

18. Lepidium Virginicum; *Virginian Pepperwort.* Flowers tetrapetalous; stem-leaves lanceolate-linear, serrate, pinnatifid; lower ones pinnate. Root annual, single, white, an inch long; stalk round, whitish, green, a foot and half high; flowers small, white, four-petalled. The inhabitants of the West Indies eat the leaves of this species in their salads as we do those of the Garden Cress. It flowers in June and July.—Native of all the Caribbee islands, and Virginia.

19. Lepidium Divaricatum; *Divaricated Pepperwort.* Leaves pinnatifid; stem very much branched; silicles ovate, subemarginate.—Native of the Cape of Good Hope. It flowers from May to August.

20. Lepidium Iberis; *Bushy Pepperwort*, or *Sciatica Cress.* Flowers two-stamined, four-petalled; lower leaves lanceolate, serrate; upper leaves linear, quite entire. This has a long fleshy root, which runs deep into the ground, and sends out many oblong leaves spreading flat on the ground; stalks slender, stiff, branching out horizontally on every side, about two feet high. The flowers are diandrous, and come out in small close clusters at the ends of the branches; they are white, and appear in June and July. This plant, says Meyrick, has been long noticed for its efficacy in the sciatica, or hip gout. The method of using it is as follows; bruise a good quantity of the root in a mortar, and mix it into an ointment with hogs-lard. Let the hip and adjoining parts be well rubbed with this ointment, and afterwards covered with a thick plaster of the same, which must remain upon the part till it becomes inflamed. It is then to be removed, and after the parts have been anointed with a mixture of oil and wine, the patient must go into a warm bath; which generally completes the cure. But if any of the pain remains, or the disorders threatens a return, the whole process is to be repeated in a fortnight or three weeks' time.—Native of the south of France, Italy, Sicily, Germany, Spain, and Siberia. The roots will abide several years in a dry soil. If the seeds be permitted to scatter, they will come up early in the spring without care.

21. Lepidium Bonariense. Flowers two-stamined, four-petalled; petals minute; all the leaves pinnate-multifid. The flowers are so small that they cannot be seen with the naked eye.—Native of Buenos Ayres, Brazil, and other parts of South America; it has also been found in the southern extremities of Africa. Sow the seeds on a moderate hot-bed in the spring, and when the plants have obtained strength, transplant them on a warm border.

22. Lepidium Chalepense. Leaves sagittate, sessile, toothed. Roots creeping; flowers in loose bunches at the ends of the branches, small, and white.—Native of the Levant, about Aleppo. This is a perennial plant, which plentifully increases by its creeping roots.

23. Lepidium Piscidium. Leaves elliptic-oblong, acute, quite entire; flowers tetradynamous. Stem herbaceous, two feet high, with the branches spreading at bottom, and thence ascending, round and even; peduncles round, even, almost upright, two hands in length; flowers small, and white.—Native of Botany island, Teautea, and Huaheine, in the South Seas. It is used by the inhabitants for taking fish by inebriating them; and, though very acrid, was used by our navigators in their salads along with the twelfth species, which it resembles, though differing in essential marks. It is perennial, and will increase abundantly by its creeping roots.

Leptospermum; (South Sea Myrtle,) a genus of the class

Icosandria, order Monogynia.—Generic Character. *Calix:* perianth half superior, in five deep, ovate-oblong, or roundish, often coloured segments. *Corolla:* petals five, with claws, roundish, equal, twice the size of the calix, and much longer than the stamina. *Stamina:* filamenta numerous, inserted into the calix, awl-shaped, incurved, shorter than the corolla; antheræ small, roundish, two-lobed. *Pistil:* germen half inferior, turbinate; style simple, columnar, erect. about the length of the stamina; stigma capitate, umbilicate, undivided. *Pericarp:* capsule roundish, coated in the lower part, of three, four, or five cells, and as many valves, bursting at the upper part, the partitions from the middle of each valve opposite to each calix-tooth. *Seeds:* numerous, linear, somewhat angular, tapering at each end, very small, inserted into the central column. Essential Character. *Calix:* five-cleft, half-superior. *Petals:* five, with claws, longer than the stamina. *Stigma:* capitate. *Capsule:* three to five celled. *Seeds:* angular.——The species are,

1. Leptospermum Scoparium; *New Zealand Tea*, or *Common South Sea Myrtle.* Leaves ovate, mucronate, obsoletely three-nerved; calices smooth; teeth membranaceous, coloured. This is a small tree or shrub, sometimes growing to a moderate height, and generally bare on the lower part, with a number of small branches growing close together towards the top; the younger ones silky.—The underwood in Adventure Bay and Van Diemen's Land, chiefly consists of this shrub. It grows commonly in dry places near the shores in New Zealand. The leaves were used by Captain Cook's ships' crews as tea; whence they named it the *Tea-Plant.* The leaves have a very agreeable bitter flavour, with a pleasant smell when fresh; but lose something of both when dried. The infusion made strong proved emetic to some in the same manner as green tea. It was also used with spruce leaves in equal quantity, to correct their astringency in brewing beer from them; and they rendered the beer exceedingly palatable. This plant is easily kept in our green-houses, and is covered in summer with elegant white blossoms, whose calix-teeth, stamina, and style, are purplish.

2. Leptospermum Aromaticum. Leaves linear-lanceolate, nerveless, quite entire; calicine segments coloured, deciduous. It flowers in July.—Native of New Zealand.

3. Leptospermum Flavescens. Leaves linear-lanceolate obtuse, nerveless; calices smooth; teeth membranaceous, coloured, naked. Petals white, often with a purple tinge, turning yellowish in drying.—Dr. Smith received it from New South Wales.

4. Leptospermum Attenuatum. Leaves lanceolate-linear, acute, three-nerved; calices silky, villose; teeth membranaceous, coloured, almost naked. The flowers of this seem to have been white, and generally grow two together on short flower-stalks, which are silky like the calix.—This was also received by Dr. Smith from New South Wales.

5. Leptospermum Lanigerum. Leaves obovate, lanceolate, obscurely three-nerved; calices clothed with long shaggy hairs. This species varies with smooth and downy leaves; and the calix is sometimes merely silky, sometimes clothed with long and thick projecting down. Some of the varieties are to be met with in Kew Gardens.—Imported by Dr. Smith from New South Wales.

6. Leptospermum Parvifolium. Leaves obovate, nerveless; branchlets and calices silky, villose; teeth membranous, coloured, naked. Flowers terminal, solitary, small, white. The leaves are not a quarter of an inch long, flat, thickish, dotted, smooth, on short stalks.—Imported from N. S. Wales.

7. Leptospermum Arachnoideum. Leaves awl-shaped, sharp-pointed; branchlets rough-haired; calices and teeth villose. Flowers small, solitary, terminating the short subdivisions of the branches, and remarkable for the very long and fine white spreading hairs, like a spider's web, which clothe the germen and whole calix.—Brought from New South Wales.

8. Leptospermum Juniperinum. Leaves linear-lanceolate, sharp-pointed; branchlets silky; calices smooth; teeth membranaceous, coloured, naked. Flowers numerous, white, solitary, at the ends of the leafy shoots.—Imported from New South Wales.

9. Leptospermum Baccatum. Leaves linear-lanceolate, sharp-pointed; bractes smooth; germen and calix-teeth, downy; capsule with a pulpy coat. This is a low depressed shrub. The flowers seem to be yellow, and by the appearance of the dried fruit it must be very pulpy.—Native of New South Wales.

10. Leptospermum Ambiguum. Leaves linear-lanceolate, recurved at the point; calices smoothish; teeth leafy, lanceolate, naked; stamina longer than the corolla. It forms a handsome bushy evergreen shrub, blossoming plentifully in the green-house in summer. The branches are downy; leaves numerous, crowded, dark-green, channelled, dotted, recurved at the tip. Flowers white.—Received from New S. Wales.

11. Leptospermum Virgatum. Leaves opposite, linear-oblong, bluntish; stalks axillary, three-flowered; umbels terminating. The under surface of the leaves is covered with dark resinous spots.—Gathered by Forster in New Caledonia.

12. Leptospermum Triloculare. Leaves linear-lanceolate, sharp-pointed; calix silky; teeth coloured, minutely fringed; stamina fifteen; capsule three-celled.—Native of New Holland.

Lerchea; a genus of the class Monadelphia, order Pentandria.—Generic Character. *Calix:* perianth one-leafed, tubular, five-toothed, permanent. *Corolla:* one-petalled, funnel-form; tube longer than the calix; border five-parted, rather erect. *Stamina:* filamenta scarce any, but the tube of the germen; antheræ five, oblong, seated on the tube of the germen. *Pistil:* germen subovate, superior, terminated (within the corolla) by an obtuse tube; style within the tube of the germen, filiform, length of the stamina; stigmas two or three, rather obtuse. *Pericarp:* subglobose, torulose, three-celled, sometimes two-celled. *Seeds:* very many. Essential Character. *Calix:* five-toothed. *Corolla:* funnel-form, five-cleft. *Antheræ:* five, placed on the tube of the germen. *Style:* one. *Capsule:* three-celled, many-seeded.——The only known species described is,

1. Lerchea Longicauda. This is an irregular growing shrub, with sordid jointed branches; leaves opposite, lanceolate, petioled, even, quite entire, a foot long; stipules ensiform, shorter than the petioles; spike terminating, filiform, a foot in length; with remote, scattered, minute flowers.—Native of the East Indies.

Leskia; a genus of the class Cryptogamia, order Musci, or Mosses.—Generic Character. *Capsule:* oblong; peristome double; the exterior with sixteen teeth, which are acute; the interior membranaceous, divided into equal segments. *Males:* gemmaceous in different individuals. This genus is united to *Hypnum*, as agreeing therewith entirely in habit, and differing only in the uncertain character of the inner fringe, which is furnished with sixteen simple teeth, instead of double or compound ones.

Lettuce. See *Lactuca.*

Lettuce Lamb's. See *Valeriana.*

Leucoium; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* spathe oblong, obtuse, compressed, gaping on the flat side, withering.

Corolla: bell-shaped, expanding; petals six, ovate, flat, conjoined at the base; with the tips thickish and stiffish. *Stamina:* filamenta six, setaceous, very short; antheræ oblong, obtuse, quadrangular, upright, distant. *Pistil:* germen roundish, inferior; style clavate, obtuse; stigma setaceous, upright, sharp, longer than the stamina. *Pericarp:* capsule top-shaped, three-celled, three-valved. *Seeds:* several, roundish. *Observe.* The third species has a filiform style. ESSENTIAL CHARACTER. *Corolla:* bell-shaped, six-parted, thickened at the tips; stigma simple.—These bulbs are increased by offsets, which the two first sorts put out pretty plentifully in a favourable situation, where they are not too often removed. They should have a soft loamy soil, and an exposure to the east. Plant the roots six inches asunder, and four or five inches deep. They should not be transplanted oftener than every third year. A north or east border is best for them; and the proper soil a mixture of loam and bog-earth. In different aspects, however, their flowering may be forwarded or protracted, and thus a longer succession of these and other flowers produced.——The species are,

1. Leucoium Vernum; *Great Spring Snowdrop.* Spathe one-flowered; style club-shaped; leaves flat; bulb oblong, shaped like that of Daffodil, but smaller; scape angular, near a foot high, hollow, and channelled; corolla much larger than that of the Common Snowdrop; and the ends of the petals are green. The flowers, which at first sight resemble those of the Common Snowdrop, are easily distinguished by the absence of the three-leaved nectary. They do not come out so soon by a month. This plant being of a different genus from the true Snowdrop, ought certainly to have another English name; Mr Curtis therefore calls it *Spring Snowflake.* Parkinson had already called it *Great Early Bulbous Violet;* and Gerarde, *Late-flowering Bulbous Violet.* —Native of Italy, the south of France, Germany, Austria, and Switzerland.

2. Leucoium Æstivum; *Summer Snowdrop.* Spathe many-flowered; styles club-shaped; leaves flat; bulb the size of a chesnut, somewhat ovate, outwardly pale brown, inwardly white; coats numerous, thin, and closely compacted; flowers pendulous, growing all one way, having little scent; petals white, finely grooved within, not at all uniting at bottom, the tips thickish, a little puckered, and marked with a green spot; seeds large, black, and glossy. The flowers appear at the end of April or the beginning of May, and there is a succession of them during three weeks, or longer in cool weather. Mr. Curtis, to distinguish it from Galanthus, names it *Summer Snowflake*: in the gardens it is known by the name of *Great Summer Snowdrop*; *Late* or *Tall Snowdrop:* Parkinson calls it *Great Late-flowering Bulbous Violet*; and Gerarde, *Great Many-flowering Bulbous Violet.*—Native of Hungary, Austria, Carniola, Tuscany, and Silesia. Mr. Curtis first observed it in England between Greenwich and Woolwich, about half a mile below the former place, close by the Thames side, just about high water mark, along with Reed, Marsh Marigold, and other common water-plants, and in a similar situation to that in which it is found wild in Austria. It has also been found wild in the Isle of Dogs, which is the opposite shore, and grows more luxuriantly in those places than in gardens, where it seldom has a soil or situation sufficiently moist. Mr. Gough found it on a small island about three miles south of Kendal, upon the dam of a gunpowder mill.

3. Leucoium Autumnale; *Autumnal Snowdrop.* Spathe two-leaved, many-flowered; styles and leaves filiform; bulb thick for the size of the plant, composed of many glutinous coats, bitter, covered with a whitish membrane. It is distinguished by its four or five capillary leaves, which begin to spring up after the flower is past, when the seeds are ripening, and sometimes after the heads are ripe. They abide all the winter and spring following, and wither away in the beginning of summer, leaving the scape to appear naked. The flowers are a little reddish at the bottom next the stalk.—It flowers in September, and is a native of Portugal and Spain.

4. Leucoium Strumosum. Spathe two-leaved, many-flowered; flowers erect; style inflated at the base, globular; bulb roundish, white, less than a hazel-nut; scape flexuose, erect, slender, about half a foot high, roundish, terminated by a spreading umbel of from three to seven flowers; flowers without scent, coming out successively; petals white within, purplish without. It flowers in November, and is a native of the Cape of Good Hope, and must be housed and treated in the same way as other Cape bulbs.

Levisanus; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth common hemispheric, imbricated, many-flowered; leaflets linear; perianth proper, one-leafed, superior, five-toothed, sharp, upright, permanent. *Corolla:* petals five; claws slender; borders oblong, shorter. *Stamina:* filamenta five, capillary, inserted into the bottom of the perianth; antheræ oblong. *Pistil:* germen top-shaped, inferior; styles two, conjoined into one, or else distinct and approximated, capillary; stigma simple. *Pericarp:* berry corticated, ovate, incrusted by the calix, with the tip free, two-celled. *Seeds:* five or six, oblong, compressed. *Receptacle of the seeds:* fungous, large in the middle of the partition. *Receptacle:* common, globose, villose, chaffy. *Observe.* The fruit of all the species is not yet known. ESSENTIAL CHARACTER. Flowers aggregate, *Calix:* one-leafed, superior, five-cleft. *Corolla:* five-petalled, superior. *Filamenta:* superior; filamenta inserted into the base of the perianth; styles two, conjoined; berry two-celled. *Seeds:* five or six, compressed.——The species are,

1. Levisanus Nodiflorus. Leaves imbricate, three-sided, acute; calix five-parted; petals five, linear, having a chink on each side of the claw, with a converging margin; receptacle double.—Native of the Cape of Good Hope.

2. Levisanus Paleaceus. Leaves in five rows, imbricate, pressed close; corymb terminating; chaffs of the heads standing out; flowers many, panicled; styles two; receptacle hairy.—Native of the Cape of Good Hope.

3. Levisanus Abrotanoides. Leaves linear-lanceolate, spreading, three-sided, callous at the tip; heads of flowers globular, terminating, subumbelled, on round peduncles; corolla white.—Native of the Cape of Good Hope.

4. Levisanus Radiatus. Leaves linear, three-sided; calix rayed; the inner leaflets coloured; stem from a foot to two feet in height, the size of a swan's quill, upright, round, leafy, scarred, determinately branched, dichotomous or trichotomous; the branches rod-like, hairy; common corolla dusky, not at all glutinous.—Native of the Cape of Good Hope.

5. Levisanus Glutinosus. Leaves linear, three-sided; calix rayed, all the leaflets coloured; stem from a foot to two feet in height, the size of a swan's quill, upright, round, grooved, scarred, very much branched; branches proliferous, hairy; common corolla dusky, very glutinous; receptacle chaffy.—Native of the Cape of Good Hope.

Lewisia; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* coloured, scariose, from seven to nine-leaved, patent. *Corolla:* containing from fourteen to eighteen petals, white, lanceolate, patent. *Stamina:* filamenta from fourteen to eighteen, inserted on the receptacle, opposite to the petals, filiform, shorter than the

calix; antheræ oblong, erect. *Pistil:* style filiform, a little longer than the stamina, three-cleft above; stigmata three, bifid; germen above ovate, glabrous. *Pericarp:* capsules oblong, trilocular; locules bispermous. *Seeds:* lenticular, shining black. ESSENTIAL CHARACTER. *Calix:* seven to nine-leaved, scariose. *Petals:* from fourteen to eighteen. *Style:* trifid. *Capsule:* trilocular, polyspermous; seed shining.——There is only one species known.

1. Lewisia Rediviva. Root fusiform, branchy, and of a bloody hue; radical leaves linear, subcarnose, somewhat obtuse; pedicel geniculated at the base. The calix is elegantly red-veined, of a consistency like paper.—It flowers in July, and was found by Lewis on the banks of Clarck's river.

Leysera; a genus of the class Syngenesia, order Polygamia Superflua.—GENERIC CHARACTER. *Calix:* common ovate, imbricate: scales obtuse, concave, harsh. *Corolla:* compound, rayed; corollets hermaphrodite, tubular, several in the disk; females strap-shaped, several in the ray; proper of the hermaphrodite funnel-form, five-toothed, rather upright; female strap-shaped, lanceolate, entire. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* in the hermaphrodites, germen small; style filiform; stigma bifid. *Pericarp:* none; calix unchanged, *Seed:* in the hermaphrodites solitary, oblong; down five-bristled, feathery, long, within which is a very short chaffy crown; in the females very similar; down with the chaffy crown alone, without feathers. *Receptacle:* naked; chaffs of the rays alone, separating the flowers. ESSENTIAL CHARACTER. *Calix:* scariose; down chaffy; in the disk feathery also. *Receptacle:* subpaleaceous.——The species are,

1. Leysera Gnaphalodes; *Woolly Leysera.* Leaves scattered; flowers peduncled. This is an evergreen shrub, with a balsamic smell; the trunk and older branches are leafless and brown; the younger ones very closely covered with leaves, and spreading out very wide; peduncles filiform at the ends of the branchlets, solitary, one-flowered; corolla yellow; seeds brownish. It flowers from July to September.—Native of the Cape of Good Hope.

2. Leysera Callicornia. Leaves in three rows; flowers subsessile; receptacle flat, with raised dots in the middle, naked, rugged, and having a single row of chaffs in circumference.—Native of the Cape of Good Hope.

3. Leysera Paleacea. Leaves three-sided, callous at the tip, and curved back. The whole receptacle covered with chaffs almost the length of the flowers; the whole crown of the seed membranaceous, and none downy. Hence it agrees in character with Buphthalmum; but it resembles the preceding so much, as scarcely to be distinguished from it in appearance.—Native of the Cape of Good Hope.

Liatris; a genus of the class Syngenesia, order Polygamia Æqualis.—GENERIC CHARACTER. *Calix:* common oblong, imbricated, with several subovate unarmed coloured scales. *Corolla:* compound, tubular, uniform; corollets hermaphrodite, equal; proper one-petalled, funnel-form; tube inflex; border five-cleft; divisions recurved. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* germen oblong; style filiform, very long, bifid to the stamina, straight; stigmas rather sharp. *Pericarp:* none; calix unchanged. *Seeds:* solitary, cornered; down feathery, coloured, sessile. *Receptacle:* naked, flat. ESSENTIAL CHARACTER. *Calix:* oblong, imbricate, awnless, coloured. *Down:* feathered, coloured. *Receptacle:* naked, hollow, dotted.——The species are,

1. Liatris Noveboracensis; *Long-leaved Liatris.* Leaves lanceolate-oblong, serrate, pendulous; stems several, ten or twelve feet high, smooth, deeply striated, pale green, stout, rigid, straight, not branching except at top; flowers in a sort of umbel, or corymbed at top; the florets are of a deep purple colour; and the calix is tinged with purple.—Native not only of New York, but of Virginia, Carolina, and other parts of North America.

2. Liatris Prælta; *Tall Liatris.* Leaves lanceolate-oblong, serrate, spreading, hirsute underneath; root perennial, large, striking deep into the ground; stems branching only at top, seven or eight feet high, purplish, straight, deeply striated; flowers in loose erect bunches at the ends of the branches; florets pale purple; receptacle naked. It flowers from September to November.—Native of Virginia, Carolina, and other parts of North America.

3. Liatris Glauca; *Glaucous Liatris.* Leaves ovate-oblong, acuminate, serrate; flowers corymbed; calices roundish; root perennial; stems six or seven feet high, purple and channelled; florets dark purple, inclining to violet.—Native of Maryland, Virginia, and Carolina.

4. Liatris Squarrosa; *Rough headed Liatris.* Leaves linear; calices squarrose, subsessile, acuminate, lateral; root tuberous; stems simple, from two to three feet in height; peduncles an inch long, alternate from the upper axils; heads of flowers squarrose, with leafy scales standing out and bent back. It flowers in July and August.—Native of Carolina, and most of the provinces of North America.

5. Liatris Scariosa; *Rugged-cupped Liatris.* Leaves lanceolate, quite entire; calices squarrose, peduncled, blunt; root large, tuberous; stem one, strong, channelled, three or four feet high; flowers purple, in a long loose spike, at the upper part of the stem, on pretty long blunt peduncles; they have large rough calices, composed of wedge-shaped scales; the flowers at the top of the spike open first. It flowers in August, but the seeds do not ripen here.—Native of Virginia.

6. Liatris Pilosa; *Hairy-leaved Liatris.* Leaves linear, hairy; flowers axillary, on long peduncles; stem hairy, from three to five feet in height; flowers purple, sessile, subimbricate, in spikes; calices many-flowered, with the scales pressed close; stems simple. It flowers in September and October.—Native of North America.

7. Liatris Speciosa; *Hairy-cupped Liatris.* Leaves linear-sickled; flowers sessile, in spikes; calicine leaflets rough-haired, acute; inner elongated, coloured at the tip; stem upright, two feet high, tomentose; calices five-flowered, red at the tip. It flowers in October.—Native of Carolina and Georgia.

8. Liatris Spicata; *Spiked Liatris.* Leaves linear, ciliate at the base; flowers in spikes, sessile, lateral; stem simple; root tuberous; stem smooth, three feet high; flowers purple, subimbricate, on short peduncles. It flowers from August to October.—Native of North America, where it is called *Throatwort*, the root being discutient.

9. Liatris Heterophylla. Stalk simple, glabrous; leaves lanceolate, glabrous, smooth; upper leaves linear-lanceolate, very much smaller than the lower ones; calix spicate, slightly pedunculate, subsquarrose; squames lanceolate, acute, naked.—It grows in South Carolina and Georgia.

10. Liatris Cylindracea. Leaves grassy; squames rounded at the top, abruptly mucronated; calix subsessile, cylindrical, with few flowers, which appear from August to October, and is a native of South Carolina and the Illinois.

11. Liatris Gracilis. Stalk simple, glabrous; leaves linear, naked; calix racemose, subglobose; pedicels elongate, patent, squamose-bracteolate; squames oblong. It flowers from August to October.—Native of Georgia.

12. Liatris Sphæroidea. Stalk simple, pubescent; leaves smooth; upper leaves lanceolate-linear; lower ones petiolate, lato-lanceolate; calices racemose, solitary, alternate, subglo-

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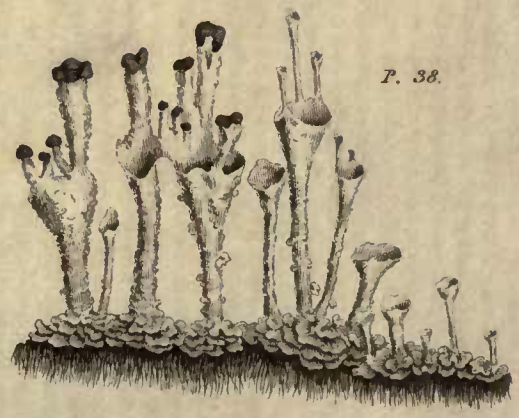
P. 17.

LATHYRUS ___ *Small Broad-leaved Everlasting Pea.*

P. 38.



LICHEN PYXIDATUS.

P. 37.

H. Frederick sc.

LICHEN CANINUS.

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bose; squames ovate, erect, ciliate at the margin. The flowers are large and handsome.—Native of the high mountains of Virginia and Carolina.

13. Liatris Pauciflora. Stalk simple, glabrous; leaves linear; panicles virgated, leafy; branches with few flowers; calices subsessile; squames lanceolate, erect, acute, glabrous. —It grows in Georgia.

14. Liatris Tomentosa. Stalk very simple; leaves cuneate-lanceolate, rough; corymb with few flowers, depressed, divaricated; calix tomentose; squames ovate, acute. It grows to the height of about eighteen inches, and is found in the open swamps of Virginia and Carolina.

Lichen; a genus of the class Cryptogamia, order Algæ.—GENERIC CHARACTER. *Male.* Flowers: *Vesicles* conglomerated, extremely small, crowded or scattered on the disk, margin, or tips of the fronds. *Female.* Flowers on the same or on a distinct plant. *Receptacle:* roundish, flattish, convex. *Tubercle:* concave. *Scutella:* subrevolute, affixed to the margin. *Pelta:* often differing from the frond in colour, within containing the seeds disposed in rows. *Observe.* The powder adhering to some Lichens seems rather to be of the nature of buds than of male fructifications. —The extremely numerous species of this genus may be conveniently divided into the following sections, some of which by some authors are made distinct genera.

Lepra: a dusty crust. Fructifications, hardly any.

Tuberculariа; a leafless crust: the fructifications tubercles.

Scutellaria: a leafless crust. Frs. Scutellæ or shields.

Collema. Fronds foliaceous, gelatinous. Frs. Scutellæ or shields.

Imbricata: fronds subfoliaceous, membranaceous, imbricated, depressed, flexile. Frs. Scutellæ.

Physcia. Fronds foliaceous, membranaceous, depressed, or ascendant, tubular within. Frs. Scutellæ sessile or pedunculated.

Lobaria. Fronds foliaceous, membranaceous, ascending, flexile. Frs. Scutellæ sessile or pedunculated.

Cornicularia. Fronds foliaceous, membranaceous, or cartilaginous, somewhat upright, narrowed, stiff, with somewhat sharp extremities; scutellæ sometimes terminal, transverse.

Stricta. Fronds foliaceous, subcoriaceous, scattered over beneath with white excavated points. Frs. Scutellæ or peltæ.

Peltigeræ. Fronds foliaceous, coriaceous, ascending, soft. Frs. Peltæ.

Umbilicaria. Fronds foliaceous, upright, stiff, shielded. Frs. Scutellæ.

Pyxidium. Stems upright, funnel-form, hollow within; tubercles fungiform, unequal, marginal.

Cladonia. Stems upright, somewhat columnar, branchy, hollow within, with the appearance of a shrub; the axillæ often perforated. Frs. Fungiform tubercles.

Stereocaulon. Stems erect, rather columnar, simple or branchy, solid. Frs. Tubercles.

Usnea. Stems erect or pendulous, filamentous, simple or branched. Frs. Scutellæ.

Of this very numerous genus Dr. Withering, in the third edition of his *Arrangements*, has enumerated no fewer than two hundred and sixteen species, besides a great number of varieties. Many of these are of considerable use for dyeing, and other œconomical purposes: the most remarkable are the following. Doubtless if more accurate and extensive trials were made on these neglected plants, many other œconomical uses for them might be detected; or at least many more of the same species might be applied to the same purposes.

Lichen Apthosus. The country people make an infusion of it in milk, and give it to children who have the thrush. In large doses it operates by purging and vomiting, and destroys worms.

Lichen Calcareus. So called because it is peculiar to limestone rocks: when dried, powdered, and steeped in urine, is used to dye scarlet, by the Welsh and the inhabitants of the Orkneys. The colour is said to be very fine.

Lichen Caninus; called also Lichen Cinereus Terrestris, or *Ash-coloured Ground Liverwort.* This species is one of the articles in the celebrated Dr. Mead's prescription for the cure of Hydrophobia, concerning which he says, "I can safely affirm that I have never known this method to fail of success where it has been followed before the hydrophobia began: although in the course of about thirty years, besides the experience made by others both in town and country, I have used it a thousand times. I have often wished that I knew so certain a remedy in any other disease." The method is as follows. Let the patient be blooded at the arm, nine or ten ounces. Take of the herb called in Latin, Lichen Cinereus Terrestris, or in English, *Ash-coloured Ground Liverwort*, cleaned, dried, and powdered, half an ounce. Of black pepper powdered two drachms. Mix these well together, and divide the whole into four doses, one of which must be taken every morning fasting, for four successive mornings, in half a pint of cow's milk warm. After these four doses are taken, the patient must go into the cold bath, or a cold spring, or river, every morning, fasting, for a month: he must be dipped all over, but not stay in (with his head above water) longer than half a minute, if the water be very cold. After this he must go in three times a week for a fortnight longer.—Later writers have declared that this remedy has been tried without success; but as Dr. Mead was no quack, but the most eminent physician of his time, and as no certain cure for hydrophobia has yet been found, we think it would be some consolation to those who may be under the melancholy necessity of endeavouring to prevent or cure that dreadful calamity, and even to the poor sufferers themselves, to have done every thing in their power, by employing the best means known to avert the awful catastrophe. It is of course understood that Dr. Mead's prescription is intended for those only who have been bitten by a rabid animal, and have either neglected to cut out the wounded part through ignorance, or from a doubt whether the animal were really mad; and also where the removal of the affected part would endanger the patient's life: for it cannot be too universally made known, that for the bad effects of the bite of mad dogs or venomous reptiles, *excision* of the bitten part is the only certain preventive, and should be instantly performed wherever death is not likely to be the consequence. Hesitating to do this, has cost thousands their lives. An instance of the fortitude and presence of mind necessary on these occasions, we shall subjoin. In Bengal, some years ago, when Capt. Hutchinson, on returning home in the night, attended by a servant with a torch, casually trod on a cobra de capella, which instantly bit him on the calf of his leg: the poison of this snake being more immediately mortal than the bite of any other, Capt. H. with great presence of mind cut out with his knife a large portion of the calf of his leg, and applied the burning torch to cauterize the wound, which prevented the poison from having its usual effect.

Lichen Islandicus. The Icelanders boil this in broth, or dry and convert it into bread. They likewise make gruel with it to mix with milk; but the first decoction is always thrown away, for it is apt to purge. It has recently obtained a reputation for curing consumptive complaints; but upon what foundation that reputation rest, we cannot determine.

Lichen Omphalodes, dyes wool of a brown reddish colour, or a dull but durable crimson, paler, but more lasting than

that of Orchall. It is prepared by the country people in Ireland, by steeping it in stale urine, adding a little salt to it, and afterwards making it up into balls with lime. Wool dyed with it, and then dipped in the blue vat, becomes of a beautiful purple. With rotten oak it makes a good dark brown frieze. Wool dyed with red wood or sanders, and afterwards in this, which is called Cork, Corker, or Arcell, becomes of a dark reddish. It has also been used as a styptic.

Lichen Parellus. Litmus is prepared from this species. For this purpose it is gathered from the rocks in the north of England, and sent to London in casks.

Lichen Plicatus, called *Hairy Tree*, is a very singular plant of the mosses; it grows to the branches of old oaks and other trees, and hangs down from them in tufts composed of long strings, which are frequently a foot or more in length, and the whole of them together two or three inches thick: each cluster consists of a great number of stems and branches, the largest of which do not exceed a small packthread in thickness; they are of a greyish colour, and consist of soft bark, and a firm white fibre within; the bark often appears crooked, and the branches exhibit an appearance of being jointed. The whole plant, as it grows, appears sapless, and is destitute of leaves, or any other appearance of vegetation. It is found in some of our largest forests, but is seldom to be met with any where else. The powder of this moss is an excellent astringent: it should be dried in an oven, and, after being beaten in a mortar, passed through a sieve; the white fibres will remain after the other parts have gone through the sieve, and are of no manner of use, the other parts possessing all the virtues. It is good against the whites, immoderate menstrual discharges, bloody fluxes, and spitting of blood; and deserves to be much more regarded than it is at present. The dose is half a drachm, or two scruples.

Lichen Prunastri, has a remarkable property of imbibing and retaining odours, and is therefore the basis of many perfumed powders.

Lichen Pulmonarius. This dyes woollen cloth of a durable orange. In Herefordshire they dye stockings with it of a durable brown: and it has obtained a name for curing the consumption, but probably without reason.

Lichen Pustulatus. Linnæus says, that a beautiful red colour may be prepared from this. It may be converted into an exceedingly black paint.

Lichen Pyxidatus. This little plant is common on ditch-banks, by the sides of woods or heaths, and in most other dry barren places; it consists of a thin leafy substance, which spreads on the surface of the ground, and a kind of little cup, resembling wine-glasses rising from it. The leafy part is dry, and without juice, divided into several segments or portions, which are irregularly notched, grey or greenish on the upper side, and whitish underneath. The cups are in general about half an inch high, and are each of them supported on thick clumsy stems; they are open at the mouth, of a gray colour, with a mixture of green and other colours, sprinkled over with a fine mealy substance on the surface; sometimes they grow one from the edge of another, three or four stages high, and we frequently see many other accidental varieties; they likewise bear at certain seasons little brown lumps, which are supposed, and not without a degree of probability, to be the seeds of the plant. The whole of this moss, when used, is to be taken fresh from the ground, shaken clean, and boiled in water, till the decoction is very strong; there is then to be added an equal quantity of milk to the liquor, which is then to be sweetened with honey; and will afterwards form an excellent medicine for coughs in children, particularly for the chin-cough or hooping-cough.

Lichen Rangiferinus. This is well known to be the chief food of the Rein Deer, which will grow fat upon it; and that animal supplies the contented Laplander with every article of life, as is set forth by Linnæus in his *Flora Lapponica.*

Lichen Roccella, or *Orchall*, is of very great importance as an article of commerce, being extremely valuable for dyeing wool or silk any shade of purple or crimson. For this purpose it is steeped in volatile alkali, commonly distilled from urine. In times of scarcity it has been sold at a thousand pounds sterling per ton. It comes chiefly from the Levant, but has been lately discovered to grow in the British dominions.

Lichen Tartareus. This is common on rocks in the north of England and Scotland. It may be known by its peculiarly pungent alkaline smell when moistened. Peasants who can collect twenty or thirty pounds a day, gather it for the dyers, and sell it for a penny a pound. They choose such specimens as are of a firm dense texture, and never scrape the same rock oftener than once in five years. It is prepared for use with volatile alkali and alum, but the exact process is kept a secret by the manufacturers at Glasgow. When sold to the dyers, it appears in the form of a purple powder, called *Cudbear*, a corruption of Cuthbert, the name of the inventor. This powder, being boiled with woollen yarn, communicates a purple colour to it, but not to vegetable substances; and the colour is far from being permanent.

Licuala; a genus of the class Hexandria, order Monogynia. —GENERIC CHARACTER. *Calix:* perianth three-parted, outwardly hairy, permanent. *Corolla:* three-parted, almost to the base; divisions ovate, acute, concave, deciduous; nectary sertiform, truncated, as short again as the corolla. *Stamina:* filamenta six, inserted into the nectary, upright, very short; antheræ oblong, twin. *Pistil:* germen superior, convex, three-parted, sulcated, smooth; style simple; stigmas two. *Pericarp:* drupe globose, the size of a pea, one-celled. *Seed:* a hard nut. ESSENTIAL CHARACTER. *Flowers:* all hermaphrodite. *Calix* and *Corolla:* three-parted. *Nectary:* sertiform; drupe.——The only known species is,

1. Licuala Spinosa. Trunk an ell in height, scarcely so thick as the human arm, jointed, dividing at top into about six branches, each six ells long, hardly a finger in thickness, triangular, grooved above, flat beneath, the lower half sharply serrate at the angles, and the teeth or spinules closely joined. Each of these has a leaf at top spreading like a fan, and divided into rays, all separated to the base. When the plant is mature, the flower-stalk emerges from the middle of the rays, as long as the branches or leaf stalks, involved in sheaths at the bottom, dividing into five smaller flower-stalks at top, about a hand in length, bearing green heads in three rows expanding into flowers. Rumphius says, that the nut is oblong, very hard, and striated longitudinally.—It is a native of Macassar and Celebes; where they make much use of the narrow leaves for tobacco pipes, and of the middle broad one for wrapping up fruit, &c. The wood is of little use, not being durable.

Lightfootia; a genus of the class Polygamia, order Dioecia. —GENERIC CHARACTER. *Hermaphrodite. Calix:* perianth four-leaved; leaflets ovate, concave, expanding. *Corolla:* none. *Stamina:* filamenta numerous, filiform, seated on the receptacle, permanent; antheræ roundish. *Pistil:* germen roundish, style none; stigma sessile, somewhat headed, furrowed. *Pericarp:* berry ovate, umbilicated, one-celled. *Seeds:* from three to six, oblong, compressed, cornered, glossy. *Males* on different individuals. *Calix:* perianth four-leaved; leaflets oblong, concave, equal, coloured. *Co-*

rolla: none. *Stamina:* filamenta numerous, (twenty-four,) filiform, longer than the calix, inserted into the receptacle; antheræ roundish. *Pistil:* none. *Females* on different individuals; calix as in the male, but larger. *Corolla:* none. *Pistil:* germen oblong; style none; stigma elevated, quadrangular-headed, furrowed, with convoluted margins, permanent. *Pericarp:* berry oblong, seated on a very small receptacle, umbilicated, one-celled. *Seeds:* three, five, to six, as above. *Observe.* This genus is allied to *Prockia,* with which they agree in calix, stamina, and habit, but differ in the stigma. ESSENTIAL CHARACTER. *Calix:* four-leaved. *Corolla:* none. *Female* and *Hermaphrodite. Stigma:* sessile; berry umbilicated, one-celled, with from three to six seeds.——The species are,

1. Lightfootia Serrata. Leaves oblong-ovate, serrate, acuminate; peduncles lateral, aggregate, one-flowered.—Native of Montserrat.

2. Lightfootia Theæformis. Leaves lanceolate-elliptic, serrate, bluntish; peduncles axillary, subsolitary, one-flowered; branches and all the other parts smooth. It has the habit of the Tea-shrub.—Native of the Isle of Bourbon.

3. Lightfootia Integrifolia. Leaves subcoriaceous, oblong and obovate, emarginate, almost quite entire; peduncles lateral, subaggregate, one-flowered. This is also a shrub, with round smooth branches, covered with an ash-coloured bark. Flowers larger than in the other sorts.—Native place unknown.

Lignum Campechianum. See *Hæmatoxylum.*

Lignum Colubrinum. See *Strychnos.*

Lignum Corneum. See *Garcinia.*

Lignum Læve. See *Glabraria.*

Lignum Moluccense. See *Croton.*

Lignum Vitæ. See *Guaiacum.*

Ligusticum; a genus of the class Pentandria, order Digynia.—GENERIC CHARACTER. *Calix:* umbel universal manifold; partial manifold; involucre universal membranaceous, seven-leaved, unequal; partial scarcely four-leaved, membranaceous; perianth proper, five-toothed, obscure. *Corolla:* universal uniform; florets all fertile; proper of five petals, which are equal, involute, flat, entire, inwardly keeled. *Stamina:* filamenta five, capillary, shorter than the corolla; antheræ simple. *Pistil:* germen inferior; styles two, approximated; stigmas simple. *Pericarp:* none; fruit oblong, cornered, five-furrowed, bipartile on each side. *Seeds:* two, oblong, smooth, marked on one side with five elevated striæ, flat on the other side. *Observe.* Male flowers have also been remarked. ESSENTIAL CHARACTER. *Fruit:* oblong, five-grooved on both sides. *Corolla:* equal, with involute entire petals.—The seeds of the plants of this genus should be sown in autumn, soon after they are ripe, for when they are kept out of the ground till spring, they seldom grow the first year. When the plants are fit to remove, transplant them into a moist rich border at three feet distance. They all love a moist soil and shady situation.——The species are,

1. Ligusticum Levisticum; *Common Lovage.* Leaves manifold; leaflets gashed at top; root strong, fleshy, perennial, striking deep into the ground; stems six or seven feet high, large, and channelled, divided into several branches, each terminated by a large umbel of yellow flowers.—The odour of this plant is very strong, and peculiarly ungrateful; its taste is warm and aromatic. It abounds with a yellowish gummy resinous juice, very much resembling Opoponax. Its qualities are supposed to be similar to those of Angelica and Masterwort, in expelling flatulencies, exciting perspiration, and opening obstructions; it is therefore chiefly used in uterine obstructions. A tea-cup full of the juice with Rhenish wine, or a decoction of the seeds with wine or mugwort-water, was said by Forestus to be a secret remedy of extraordinary efficacy in slow or laborious parturition. The leaves, eaten as salad, are accounted an emmenagogue. The root and seeds are of a cordial sudorific nature, and many authors of credit recommend the use of them in pestilential disorders. An infusion of the root increases the urinary discharge, removes obstructions of the viscera, brings away gravel, and helps the jaundice: the seeds produce the like effects, and are potent dispersers of wind in the stomach. The roots of Common Lovage will abide many years, and where the seeds are permitted to scatter, the plants will come up without care. This plant flowers in June and July, and the seeds ripen in autumn.—Native of the Alps of Italy, the south of France, and Silesia. It is planted in our gardens for its medical qualities.

2. Ligusticum Scoticum; *Scotch Lovage.* Leaves biternate; stalk about a foot high, and sustains a small umbel of yellow flowers, shaped like the preceding: most authors say the root is perennial. It is much valued in the Isle of Sky. The root is reckoned a good carminative; and an infusion of the leaves in whey, a good purge for calves. It is also used for food, either as salad or boiled like greens.—Native of North America, Sweden, Denmark, and Scotland, where it is found upon the rocks near the coast.

3. Ligusticum Peloponnense; *Hemlock-leaved Lovage.* Leaves manifold-pinnate; leaflets pinnately gashed; root thick, fleshy, like that of the Parsnep, striking deep into the ground. When bruised, the leaves emit a fetid odour. Stems three or four feet high, large, and hollow, sustaining large umbels of yellowish flowers.—Native of Switzerland, Austria, Dauphiny, Silesia, Italy, Peloponnesus, and Siberia.

4. Ligusticum Austriacum; *Austrian Lovage.* Leaves bipinnate; leaflets confluent, gashed, quite entire; root half a foot long or more, the thickness of the human thumb, often branched, yellowish brown on the outside, pale within, and spongy; stem upright, from two to three feet high, grooved, hollow, without any partitions at the joints; flowers strong-smelling, large, all fertile; petals white. The whole plant is smooth. It flowers from June to August.—Native of Austria, Silesia, and Italy.

5. Ligusticum Cornubiense; *Cornish Lovage.* Root-leaves decompound, gashed; stem-leaves ternate, lanceolate, entire; root perennial, spindle-shaped; stem from two to three feet in height, erect, branched, many-flowered, round, striated, roughish, purple at the base, annual; flowers white, equal, all hermaphrodite. The root contains a yellow resinous juice. This plant, as its name imports, is peculiar to Cornwall, where it grows in thickets, among bushes, and in hedges. It eluded the researches of modern botanists, till Mr. Pennington found it in 1788 in great plenty near Bodmin, where it was also gathered in the following year, though five years afterwards not a single plant could be discovered in that field; but Dr. Withering found it in another place, farther from Bodmin, among furze. Cattle are so fond of it that they eat it down wherever they can get at it.

6. Ligusticum Peregrinum; *Parsley-leaved Lovage.* Involucre of the primary umbel scarcely any, of the lateral ones membranaceous at the base; rays somewhat branched; root biennial; stem two feet high, rigid, angular, even; petals yellowish, inflex-emarginate. It resembles Parsley even in smell and taste, but all the parts are thicker and more rigid. It flowers in June and July.—Native of Portugal.

7. Ligusticum Balearicum. Leaves pinnate; lowest leaflets augmented with a leaflet; root biennial; stem round, somewhat striated, small in comparison with the umbel, a foot

high; flowers in an umbellet, eight or ten, yellow, all fertile. —Native of Majorca and Minorca, and about Rome.

8. Ligusticum Candicans; *Pale Lovage.* Superdecompound; leaflets wedge-form, gashed, smooth; universal involucre two-leaved, subfoliaceous; ribs of the seeds membranaceous, smooth. It flowers in July and August.—Native place unknown.

9. Ligusticum Actæifolium. Leaflets oval, equally dentated; involucels setaceous; fruits oblong-oval.—It grows to the height of more than three feet, and is found on the river St. Lawrence, and in Virginia near Staunton.

Ligustrum; a genus of the class Diandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, tubular, very small; mouth four-toothed, erect, obtuse. *Corolla:* one-petalled, funnel-form; tube cylindric, longer than the calix; border four-parted, spreading; divisions ovate. *Stamina:* filamenta two, opposite, simple; antheræ upright, almost the length of the corolla. *Pistil:* germen roundish; style very short; stigma two-cleft, obtuse, thickish. *Pericarp:* berry globose, smooth, one-celled. *Seeds:* four, convex on one side, cornered on the other. *Observe.* According to Gærtner, the berry is two-celled; the cells coated with a thin membrane. The seeds are two in each cell. ESSENTIAL CHARACTER. *Corolla:* four-cleft. *Berry:* four-seeded.——The species are,

1. Ligustrum Vulgare; *Common Privet.* Leaves ovate, obtuse; panicle simple, trichotomous. This shrub is usually about six feet high, branched, the branches opposite, the young ones flexible and purplish. The flowers are sweet-scented; corolla white, but soon changing to a reddish brown. This plant varies in many respects. The leaves sometimes grow by threes, and sometimes are enlarged at the base; they frequently continue green great part of the winter like the Italian Privet, which is also a variety, and rises with a stronger stem, less pliable and more erect branches, and bark of a lighter colour. The regular number of stamina is two, but sometimes there are three or four in a flower, and they have been found with white berries. Thunberg says, that in Japan the leaves are somewhat broader and more blunt than in the European shrub. In point of utility and ornament, few shrubs are preferable to the Common Privet. Its chief use is to form such hedges as are required in dividing gardens for shelter or ornament; and for this the Italian or Evergreen variety is usually preferred. It bears clipping well, is not liable to be eaten by insects, and having only fibrous roots, it robs the ground less than any other shrub. It is one of the few plants that will thrive in the smoke of London, though it seldom produces any flowers in the closer parts after the first year. It also grows well under the drip of trees. The leaves are bitter and slightly astringent; a strong infusion of them in water, with the addition of a little red wine and honey, is an excellent gargle for the mouth and throat when they are sore, or for the gums when they become spongy, and are apt to bleed. From the pulp of the berries a rose-coloured pigment may be prepared. With the addition of alum, they dye wool and silk of a good durable green, and for this purpose must be gathered as soon as they are ripe. They continue on the shrub till spring, and in times of scarcity are eaten by different sorts of birds, particularly the bullfinch. The wood is hard, and fit for turning. It is not generally eaten by cattle. Linneus says, kine, sheep, and goats, will eat it; but horses refuse it. The Sphinx Ligustri, or Privet Hawk-moth, and Phalæna Syringaria, feed on it in the caterpillar state; and Meloe Vesicatorius, Cantharides or Blister Beetle, is found on it. Our old English authors call it, *Prim, Print,* and *Primprint,* probably from its regular appearance when clipped. The Germans, Dutch, Danes, and Swedes, call it *Liguster;* the French, *Tröene;* the Italians, *Ligustro;* in Spanish, *Alhena;* in Portuguese, *Alfena:* and in Russian, *Schost.*—This shrub is easily propagated by laying down the tender shoots in autumn. In one year's time they may be removed where they are to remain, or planted in a nursery for two or three years, where they may be trained for the purposes designed. Also, by suckers, which it sends forth in great plenty. But these are not easily kept within bounds, nor do they rise so high as those which are increased by layers. Thirdly, by cuttings, planted in the autumn on a shady border, and in a loamy soil. But the strongest and best plants are raised from seeds. Gather the berries when ripe, put them into a pot with sand, bury them in the ground, as is practised with Holly-berries and Haws. After they have laid a year in the ground, take them up, and sow them in the autumn on a border exposed to the east, where the plants will come up in the following spring. The varieties with striped leaves may be increased by budding or inarching upon the plain sort; or by laying down the branches, but they seldom shoot so fast as to produce branches proper for this purpose. Being more tender, they should have a dry soil, and a warm situation. In a rich soil, they soon lose their variegation, and become plain. The Italian or Evergreen Privet, is now generally found in the nurseries instead of the common one. It is equally hardy, and will thrive in almost any situation. It is increased in the same manner; but as it seldom produces berries here, they must be procured from Italy.

2. Ligustrum Japonicum; *Broad-leaved Privet.* Leaves ovate-acuminate; panicle decompoundedly trichotomous; stem arboreous, very much branched, a fathom and half in height; branches opposite, roundish; panicle spreading. It flowers in June and July.—Native of Japan.

3. Ligustrum Sinense. Leaves lanceolate; racemes oblong, lateral, and terminating. This is a small tree, about eight feet high; flowers white, small; corolla bell-shaped.—Native of China about Canton.

Lilac. See *Syringa.*

Lilium; a genus of the class Hexandria, order Monogynia. —GENERIC CHARACTER. *Calix:* none. *Corolla:* six-petalled, bell-shaped, narrowed beneath; petals upright, incumbent, obtusely carinated on the back, gradually more expanding, wider, with thick reflex obtuse tips; nectary a longitudinal tubular line, engraven on each petal from the base to the middle. *Stamina:* filamenta six, awl-shaped, upright, shorter than the corolla; antheræ oblong, incumbent. *Pistil:* germen oblong, cylindric, striated with six furrows; style cylindric, length of the corolla; stigma thickish, triangular. *Pericarp:* capsule oblong, six-furrowed, with a three-cornered hollow obtuse tip, three-celled, three-valved; the valves collected by hairs, disposed in a cancellated manner. *Seeds:* numerous, incumbent, in a twin order, flat outwardly, semiorbicular. *Observe.* The nectary in some is bearded, in others beardless; petals in some totally revolute, in others not so. ESSENTIAL CHARACTER. *Corolla:* six-petalled, bell-shaped, with a longitudinal nectareous line. *Capsule:* the valves connected by cancellated hairs.——The species are,

1. Lilium Candidum; *Common White Lily.* Leaves scattered; corollas bell-shaped, smooth within; bulb large, from which proceed several succulent fibres; stem stout, round, upright, usually about three feet in height; flowers large, white, terminating, the stem in a cluster, on short peduncles; petals within of a beautiful shining white, on the outside rigid and less luminous. The principal varieties of this

species are, 1. With the flowers striped or blotched with purple. This is become very common; but the purple stain giving the flower a dull colour, the common white is preferred. 2. With variegated or striped leaves, or with the leaves edged with yellow. This is chiefly valued for its appearance in winter and spring: for the leaves coming out early in the autumn, spreading themselves flat on the ground, and being finely edged with a broad yellow band, make a pretty appearance during the winter and spring months. It flowers earlier than the plain sort. 3. With double flowers. This variety is of little value, because the flowers never open well, unless they are covered with glasses; nor have they any of the rich colour of the common sort. 4. With pendulous flowers; which Miller and others consider as a distinct species. It came originally from Constantinople. The stalk is much more slender; the leaves are narrower and fewer in number; the flowers are not so large, and the petals more contracted at the base; they always hang downwards.—The flowers of the Lily were formerly considered as antiepileptic and anodyne; a distilled water of them was employed as a cosmetic; and oil of lilies was supposed to possess anodyne and nervine powers: but their odorous matter, though very powerful, is totally dissipated in drying, and entirely carried off in distillation either with spirit or water, and no essential oil can be obtained from them. The roots only are now in use; they are extremely mucilaginous, and are chiefly employed in emollient and suppurating cataplasms, boiled with milk or water. Physicians, however, are generally of opinion that bread or meal poultices possess every advantage of those prepared from the lily-root. Meyrick, however, says that the root bruised and applied to hard tumors, softens and ripens them sooner than almost any other application. Made into an ointment, they take away corns, and remove the pain and inflammation arising from burns and scalds. Country people sometimes, continues he, make an oil from the flowers by infusing them in oil of olives, and apply it to any part affected with pain and inflammation with great success. It is likewise an excellent application to contracted tendons.—Native of the Levant: Linnæus says, of Syria; and Thunberg, of Japan. It flowers in June and July. This plant, with all its varieties, and in short with all the plants of the genus, may easily be increased from offsets, which the bulbs of this sort send out in such great plenty, as to make it necessary to take them off every other, or at most every third year, to prevent their weakening the principal bulb. The time for removing them is the end of August, soon after the stalks decay. They will thrive in almost any soil and situation, and as they grow tall and spread, they must be allowed room, and in large borders they are very ornamental. They are so hardy that no frost injures them; and increasing very fast, are become so very common as to be little regarded, notwithstanding the great beauty of the flowers, and their rich odour, which is too powerful for many persons.

2. Lilium Japonicum; *Japan White Lily*. Leaves scattered, lanceolate; corollas drooping, subcampanulate; stem round, smooth, and even, two feet high; flowers terminating, reflex, and hanging down; corolla white.—Native of Japan.

3. Lilium Catesbæi; *Catesby's Lily*. Leaves scattered, lanceolate; corollas upright, bell-shaped; petals with claws. Of all the lilies cultivated in this country, this is the least; the whole plant, when in bloom, being frequently not more than a foot high, though it is said to grow to the height of two feet in its native soil. The stalk is terminated by one upright flower, which has no scent. It was first observed by Catesby on open moist savannas in many parts of Carolina. He says that the bulb is about the size of a walnut; that the petals turn back in a graceful manner, and are tapering, terminating in points, and edged with small indentures; and that the whole flower is variously shaded with red, orange, and lemon colours.—It flowers in July and August; native of South Carolina. This may be raised from seeds or offsets, which, however, are not very plentifully produced, and will not grow in perfection without great care; the roots in particular are to be guarded against frost.

4. Lilium Bulbiferum; *Bulb-bearing* or *Orange Lily*. Leaves scattered; corollas bell-shaped, erect, rugged within; bulb subovate, consisting of thick white loosely imbricate scales, putting out a few thick fibres from the bottom; stem upright, a foot and half high, striated, angular; flower without scent, red-orange within, pale-orange on the outside; all the petals, from the base to beyond the middle, are rugged with little scales and apophyses, with a few black dots. There are many varieties, in size, leaves, and flowers. Mr. Miller mentions the following: 1. Orange Lily with double flowers. 2. Orange Lily with variegated leaves. 3. Smaller Orange Lily. 4. Bulb-bearing Fiery Lily. These seldom rise more than half the height of the others; the leaves are narrower; the flowers smaller, and of a brighter flame colour, few in number, and more erect. They come out a month before those of the common sort, and the stalks put out bulbs at most of the axils, which, if taken off when the plants decay, and planted, will produce plants. There are also several subordinate varieties, but not worth enumeration. The Orange Lily is found wild in Austria: it also grows in Italy, and other southern regions of Europe; in Siberia, and in Japan. This sort is grown so common, and increases so readily by offsets, that it is almost rejected. It should not, however, be excluded from large gardens, since, when properly disposed, it makes a handsome appearance while in flower. The stalks decay in September, the roots may be then transplanted, and the offsets taken off; but as it does not put out new leaves till toward spring, this may be done till near Christmas. It should be repeated once in three years. It will thrive in any soil or situation; but will be strongest in a soft, gentle, and not too moist loam. The bulb-bearing varieties may also be increased without taking up the plants, by means of the little bulbs that are put forth in plenty from the axils of the leaves. Both these sorts, with their varieties, will thrive under the shade of trees, and are therefore proper to be introduced into plantations, and on the borders of woods.

5. Lilium Pomponium; *Pomponian Lily*. Leaves scattered, awl-shaped; flowers turned back; corollas rolled back. This has a pretty large scaly root, from which rises an upright stalk nearly three feet high. The upper part of the stalk divides into four or five pedunculs, each sustaining a single flower of a fine carmine colour, with a few dark spots scattered over it. They appear in July, and in hot seasons continue a considerable time in beauty. The pedunculs are very long, so that the flowers spread out very wide.—Native of the Pyrenees, Japan, and China. This, and the four following species, may be propagated by offsets, which some produce in great plenty, but others send out very few, and are therefore more scarce. The roots may be taken up when the stalks decay, and if there be a necessity for keeping them out of the ground to remove them to a distant place, they should be wrapped in dry moss, which will preserve them for two months. The best time to replant them is at the beginning of October, but if the ground be not ready to receive them, they should be covered with dry sand or wrapped in moss, to prevent the scales from shrinking, which weakens the bulbs, and often occasions them to be mouldy and rot. The roots should be planted five or six inches deep in the ground, especially if

the soil be light and dry; but where it is moist, raise the borders five or six inches; for if the water come near the roots in winter, it will rot them; and where the soil is stiff and binding, mix a good quantity of sea-coal ashes or rough sand with it.

6. Lilium Chalcedonicum; *Scarlet Martagon Lily.* Leaves scattered, lanceolate; flowers turned back; corollas rolled back. It is from three to four feet high; the leaves are much broader than those of the preceding, and appear as if they were edged with white; they are placed very closely upon the stalks. The flowers are of a bright scarlet, and seldom more than five or six in number. It flowers late in July, and in cool seasons continues in beauty great part of August. There are some varieties of this species in the size and colour of the flowers, which are sometimes of a blood red.—Native of the Levant, and the mountains between Carniola and Carinthia. See the preceding species.

7. Lilium Superbum; *Great Yellow Martagon Lily.* Leaves scattered; flowers in a branched pyramid, turned back; corollas rolled back; stem round, very smooth and even, panicled at top, two feet high and more; branches alternate, divaricating, upright, like the stem, reflex at top, flower-bearing; one flower at the end of each branch; corollas large and handsome; petals oblong, acute, white, with large purple spots and smaller black ones from the middle to the base. See the fifth and eighth species.

8. Lilium Martagon; *Purple Martagon Lily.* Leaves in whorls; flowers turned back; corollas rolled back. This rises with a strong stalk from three to four feet high; flowers dark purple with some spots of black; they are produced in loose spikes, appear in June, and have a disagreeable odour when near, but not so offensive as the preceding; stem straight, round, shining, from a foot and half to four feet in height.—Native of the south of Europe, and of Siberia. There is a variety which flowers early in June, known in old gardens by the name of Turk's Caps. In Holland they raise a great variety of Martagons: those most commonly found in the English gardens are, 1. The Common Martagon with double flowers; 2. The White; 3. The Double White; 4. The White Spotted; 5. The Imperial; 6. The Early Scarlet; 7. The Constantinople Vermilion Martagon. The way of obtaining these and other varieties is, by sowing the seeds of the best flowers in square boxes, six inches deep, with holes bored in their bottoms, and filled with light sandy earth: the beginning of October, soon after the seeds are ripe, is the proper season. Sow them pretty thick, covering them about half an inch with light sifted earth; place the boxes where they may have the morning sun only, and refresh them with water often, if the season prove dry. In November remove them to where they may have as much sun as possible, and be screened from wind. About the beginning of April restore them to their former position: for now the young plants, which are impatient of heat, will appear; and the soil will dry too fast, if exposed to the full sun at noon. Keep them entirely free from weeds, and refresh them gently and cautiously with water in dry seasons. Let the boxes remain till the beginning of August; then prepare some beds of fresh light earth, level them, and take the earth out of the boxes with the small bulbs, and strew it equally over the beds, covering it half an inch thick with fine sifted earth. If the season prove hot and dry, shade the beds in the middle of the day, and refresh them with water.—If the following winter season be severe, cover the beds with pease-haulm, or other light covering, to keep out the frost; but this would injure the bulbs in mild weather. At the end of February, or the beginning of March, when the hard frosts are over, gently clear off the earth upon the surface of the beds, and sift a little fresh earth over them: but in doing this, do not disturb or injure the bulbs. Keep them clear from weeds; water them gently in dry weather, and in very hot days shade them from the sun. When their leaves are quite decayed, stir the surface of the beds again; and in September sift more fresh earth over the beds. During winter and spring manage them as before directed. In September following, transplant the bulbs to a greater distance, on beds prepared as above; place them about eight inches asunder, with the buds uppermost, and four inches deep: this should be done in moist weather. The second year after being planted in these beds, the strongest bulbs will begin to flower; then place a stick wherever you observe any peculiar varieties; and when the leaves are decayed, remove these bulbs into other beds at a greater distance, or into the borders of the flower-garden; but never reject any till they have flowered two years: for frequently some will make a mean appearance the first year, and afterwards become fair handsome flowers, when they have obtained strength. When such have been selected as are worth preserving, the rest may be planted in shady outer walks, or in the borders of plantations. See the three preceding and the first species.

9. Lilium Canadense; *Canada Martagon Lily.* Leaves in whorls; flowers turned back; corollas resolute, bell-shaped; bulbs oblong and large; stems from four to five feet high; flowers large, yellow, spotted with black; they come out in the beginning of August, and, when the roots are large, in great numbers, making a fine appearance. There is a variety of it with larger and deeper-coloured flowers.—Native of Canada; observed also in Pennsylvania and Japan. See the four preceding species, and also the first species.

10. Lilium Kamschatcense; *Kamtschatka Lily.* Leaves in whorls; flower erect; corolla bell-shaped; petals sessile; bulb roundish, small; stem quite simple, round, even, a foot high; flowers terminating, few, an inch and half in diameter, on very short, naked, almost upright peduncles.—Native of Kamtschatka, and also of China and Cochin-china.

11. Lilium Philadelphicum; *Philadelphian Martagon Lily.* Leaves in whorls; flowers erect; corolla bell-shaped; petals with claws; root smaller than in other sorts, scaly and white; stem single, upright, nearly a foot and half high, terminated by two flowers, which stand erect upon short separate peduncles: they are shaped like those of the Bulb-bearing Fiery Lily; but the petals are narrower at their base; towards which they are marked with several dark purple spots, their general colour being a bright purple. It flowers in July, and the seeds ripen at the end of September.—Native of North America; observed also in Japan. This species growing in a small compass, and the flowers having no ill smell, is proper for the borders of small gardens. The stalks decay soon after the seeds are ripe: then is the proper time to remove the roots, which do not put out new fibres till after Christmas. The bulbs do not put out many offsets.

12. Lilium Umbellatum. Leaves linear, short; top-leaves verticillated, shorter than the peduncles; flowers from three to five, umbellated, erect; petals recurvo-patent, subequal, ovate-oblong, subunguiculate; the flowers are of an uniform deep scarlet colour, and are highly ornamental.—It was found upon the banks of the Missouri by Messrs. Lewis and Nuttall. Pursh conjectures it to be the same with the one figured in the *Paradisus Londinensis*, under the name of Lilium Concolor.

Lily, Day. See *Hemerocallis.*

Lily, Guernsey. See *Amaryllis.*

Lily, May. See *Convallaria Maialis.*

Lily, Persian. See *Fritillaria.*

Lily, Superb. See *Gloriasa.*

P. 42.

LILIUM — *Philadelphian Martagon Lily.*

P. 47.

LINUM PERENNE — *Perennial Flax.*

F. Hillard Sc

H. Fisher, Son & Co. London. 1828.

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Lily, Thorn. See *Catesbæa.*
Lily of the Valley. See *Convallaria.*
Lily, Water. See *Nymphæa.*
Lime Tree. See *Citrus* and *Tilia.*

Limeum; a genus of the class Heptandria, order Digynia. —GENERIC CHARACTER. *Calix:* perianth five-leaved; leaflets ovate, acuminate, keeled, membranaceous on the margin, two exterior, permanent. *Corolla:* petals five, equal, ovate, somewhat clawed, obtuse, shorter than the calix; nectary, a margin surrounding the germen, bearing the stamina. *Stamina:* filamenta seven or fewer, awl-shaped, shorter than the corolla; antheræ ovate. *Pistil:* germen globose; style parted, cylindric, shorter than the stamina; stigmas rather obtuse. *Pericarp:* none; fruit bipartile into *Seeds:* two, hemispheric, hollow, naked; according to Gærtner, shaped like a meniscus. ESSENTIAL CHARACTER. *Calix:* five-leaved; *Petals:* five, equal; *Capsule:* globular, two-celled.——The species are,

1. Limeum Africanum; *African Limeum.* Leaves oblong, petioled; (according to Thunberg, ovate-lanceolate, subpetioled;) stems prostrate, weak, a span long, angular, naked, perennial at the base; corymbs terminating, solitary, compound, naked, on long peduncles.—Native of the Cape of Good Hope.

2. Limeum Incanum; *Hoary Limeum.* Leaves ovate, with a strong midrib underneath; tomentose.—Native of the Cape of Good Hope.

3. Limeum Æthiopicum. Leaves linear-lanceolate.—Native of the Cape of Good Hope.

Limnopeuce. See *Hippuris.*

Limodorum; a species of the class Gynandria, order Diandria.—GENERIC CHARACTER. *Calix:* spathes vague; spadix simple; perianth none. *Corolla:* petals five, ovate-oblong, about equal, spreading, the superior ones converging; nectary one-leafed, concave, foot-stalked, within the lowest petal; the length of the petals. *Stamina:* two; filamentum an oblong ascending body, the length of the corolla; antheræ two, ovate, looking forwards. *Pistil:* germen columnar, the length of the corolla, inferior; style filiform, growing to the body of the filamenta; stigma funnel-form. *Pericarp:* capsule columnar, three-valved, one-celled, gaping at the corners. *Seeds:* numerous, sawdust-like. *Observe.* Swartz says it is scarcely different from the Serapias, except in the inflorescence or scape. ESSENTIAL CHARACTER. *Nectary:* one-leafed, concave, pedicelled, within the lowest petal.——The species are,

1. Limodorum Tuberosum; *Tuberous-rooted Limodorum.* Flowers subspiked, bearded; root tuberous; stem a foot and half high; the number of flowers not exceeding five, dark purple.—Native of Virginia and South Carolina. From the little experience we have had of the management of this species, it appears to be scarcely hardy enough for the open border, yet not tender enough to require a stove. The first plants were produced here by planting the roots in pots filled with bog-earth, and plunging them into a tan-pit which had a gentle heat, for the purpose of raising plants or seeds, and for striking cuttings.

2. Limodorum Altum; *Tall Limodorum.* Flowers beardless; spikes subpanicled; root shaped like that of the true Saffron, but the outer cover of a darker brown colour: the flower-stalk arises immediately from the root, on one side of the leaves; it is naked, smooth, and of a purplish colour towards the top, nearly a foot and half high, and terminated by a loose spike of purplish red flowers on short peduncles. According to Swartz, this is the plant which Browne calls *Jamaica Salop;* and recommends the root, properly cured, as a stomachic.—Native of the West Indies; particularly of Jamaica, in the cooler parts of the mountains. This and all the following species are much too tender to thrive in the open air of England, and seldom flower even in a green-house: they are therefore kept in the tan-bed in winter; and if in summer the pots be plunged in a tan-bed under a deep frame, the plants will thrive, and flower strongly. They are propagated by offsets from the roots, which are sent out pretty freely while the roots are in vigour. They should be taken off and transplanted, at the time when the plant is most destitute of leaves; and must have a soft loamy soil, with but little watering, especially in winter.

3. Limodorum Tankervilliæ; *Chinese Limodorum.* Flowers beardless, in racemes. It flowers in March and April.—Native of China. See the preceding.

4. Limodorum Utriculatum. Root tuberous; root-leaves twin-sheathed; radical sheath inflated; scape sheathed; flowers sessile.—Native of Jamaica and St. Domingo. See the second species.

5. Limodorum Gentianoides. Root tuberous; leaflets stem-sheathed; flowers peduncled.—Native of Jamaica. See the second species.

6. Limodorum Striatum. Scape angular, smooth; leaves ensiform, nerved; petals lanceolate, with an oblong flat lip. See *Epidendrum Striatum.*

7. Limodorum Ensatum. Scape round, even; leaves ensiform, striated; petals lanceolate; lip recurved, broader.—Native of China and Japan. See *Epidendrum Ensifolium.*

8. Limodorum Falcatum. Horn filiform, very long; leaves ensiform, channelled, sickled; scape upright, smooth, shorter than the leaves; flowers in spikes, terminating.—Native of Japan. See the second species.

9. Limodorum Monile. Scape round, striated, jointed like a necklace, simple; leaves linear, simple. See *Epidendrum Moniliforme.* It is not parasitical; but grows on walls, and in hedges.

10. Limodorum Virens. Root scaly; scape branched, spotted; bractes acute; flowers remote, greenish yellow; bulbs many, connected near the base, conical, pointed; scape axillary, erect, often branched, from one to two feet high, round, smooth, coloured with purple spots; flowers striated; petals nearly equal, erect or ascending.—Native of Coromandel, on dry uncultivated ground; flowering during the dry season. See the second species.

11. Limodorum Recurvum. Root tuberous; scape bending, nodding, shorter than the leaves; leaves broad-lanceolate, five-nerved; spike globular, nodding; bulbs striated, nearly round, surrounded with one or two rings, and having many thick fleshy fibres from their lower parts; stem from the side or base of the bulb; flowers numerous, crowded, white, with a small tinge of yellow.—Native of Coromandel, in moist valleys, among the hills; flowering at the beginning of the rainy season. See the second species.

12. Limodorum Nutans. Root tuberous; scape arched, longer than the leaves, ovate, five-nerved; spike oblong, pendulous. This differs from the preceding, in having the bulbs smooth, the leaves oval, the scape longer than the leaves, the spike oblong and pendulous, with the flowers at some distance from one another, of a beautiful rose-colour, and the under lip of the nectary sharp-pointed.—Native of Coromandel; flowering as the preceding. See the second species.

13. Limodorum Aphyllum. Plant without leaves; root fibrous; flowers solitary, naked, sessile; stems perennial, several, most simple, spreading or pendulous, as the situation admits; flowers generally issuing single from the joints of the stems.—Native of Coromandel, but very rare, on dry rocky

hills; flowering in the beginning of the hot season. See the second species.

Limonia; a genus of the class Decandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, three or five-cleft, acute, very small, permanent. *Corolla:* petals three to five, oblong, obtuse, upright, spreading at the tip. *Stamina:* filamenta six to ten, awl-shaped, upright, shorter than the corolla; antheræ linear, upright. *Pistil:* germen oblong, superior; style cylindric, length of the stamina; stigma headed, flat. *Pericarp:* berry ovate or subglobose, three-celled; partitions membranaceous. *Seeds:* solitary, ovate. ESSENTIAL CHARACTER. *Calix:* five-parted. *Petals:* five. *Berry:* three celled. *Seeds:* solitary.—The species are,

1. Limonia Monophylla; *Simple-leaved Limonia.* Leaves simple; spines solitary; trunk irregular, with a smooth greenish ash-coloured bark; branches numerous, very irregular; racemes short; corolla four or five-petalled.—Native of Coromandel, in the forests on the coasts, where it grows to a small tree, though oftener found in the state of a large shrub.

2. Limonia Lucida. Unarmed: leaves simple; peduncles axillary.—Native of the Island of Mallicolla in the South Seas.

3. Limonia Trifoliata; *Three-leaved Limonia.* Leaves ternate; spines in pairs; spines stipular, longer than the petiole. This has the appearance of an orange-tree, with flexuose branches. Jussieu says the whole tree is smooth, the height of a man in the stove, with a trunk the thickness of a human arm, covered with a brownish ash-coloured bark, very much branched; the branchlets alternate, spreading; flowers sweet-smelling, on very short pedunecles, axillary, in pairs, or three together, slowly succeeding each other; corolla and filamenta white; fruit red, very soft, the size of a hazel-nut; pulp colourless, very sweet, with a slight taste of turpentine.—It is a native both of China and Cochin-china, where it is much cultivated both for its beauty and fragance, as well as the pliancy of its branches. Burman says it is also a native of Java.

4. Limonia Pentaphylla; *Five-leaved Limonia.* Unarmed: leaves commonly quinate; leaflets oblong, entire; trunk scarcely any, with an ash-coloured bark; branches numerous, nearly erect; flowers white, very fragrant.—This is an elegant fragrant shrub, very common in most uncultivated lands in Coromandel; but chiefly under large trees, where birds have dropped the seeds: it flowers there all the year. The whole plant, when drying in the shade, diffuses a pleasant permanent scent; the flowers are exquisitely fragrant; and birds eat the berries greedily.

5. Limonia Acidissima. Leaves pinnate; spines solitary. This tree is said to attain the height of thirty feet, with a trunk ten inches in diameter: the leaves and fruit have the smell of Anise.—Native of the East Indies.

6. Limonia Arborea. Stem arboreous, unarmed; leaves quinate; leaflets linear, serrate. The berries are eaten by birds; and the flowers are equally fragrant with those of the fourth sort. These two agree in habit: the serrate leaves are the chief distinction.—Native of the mountainous parts of the Circars, where it grows to a middle-sized tree, with a large branching head.

7. Limonia Crenulata. Leaves alternate, fascicled; leaflets two or three pairs, with broad-winged petioles; spines solitary; flowers white, small, fragrant, collected in small umbels or racemes, over various parts of the branchlets.—Native of Coromandel, on the low lands near the coast. It is there a shrub, but in the mountains it grows to a middle-sized tree; flowering in the hot season.

Limosella; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-cleft, upright, sharp, permanent. *Corolla:* one-petalled, bell-shaped, upright, equal, five-cleft, acute, small; divisions spreading. *Stamina:* filamenta four, upright; of which two are approximated to the same side, shorter than the corolla; antheræ simple. *Pistil:* germen oblong, obtuse, two-celled; style simple, length of the stamina, declinate; stigma globose. *Pericarp:* capsule ovate, half involved by the calix, one-celled, divided below by the partition, two-valved. *Seeds:* very many, oval; receptacle ovate, large. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Corolla:* five-cleft, equal. *Stamina:* approximating by pairs. *Capsule:* one-celled, two-valved, many-seeded.—The species are,

1. Limosella Aquatica; *Common Mudwort,* or *Bastard Plantain.* Leaves lanceolate; root annual, throwing out naked cylindrical prostrate runners, which take root at their extremities and form new plants; flowers small, radical, on simple flower-stalks, which become inflexed, as the fruit ripens.—Native of most parts of Europe, in muddy and gravelly places liable to be flooded, and where water has stood during the winter. It flowers from July to September.

2. Limosella Diandra. Leaves sublinear. This has the same habit as the preceding, but is only one-fourth of the size: hence it is one of the smallest plants we know. It increases by very short runners.—Found by Koenig on the coast at the Cape of Good Hope.

Linconia; a genus of the class Pentandria, order Digynia.—GENERIC CHARACTER. *Calix:* perianth inferior, four-leaved; leaflets ovate, permanent; the inferior opposite pair shorter. *Corolla:* petals five, lanceolate, sessile, upright; nectary a dell impressed on the bottom of the petal, begirt beneath by the margin. *Stamina:* filamenta five, awl-shaped, margined upright, middling; antheræ obtuse, sagittated with nutant gaping auricles. *Pistil:* germen half inferior, with respect to the corolla; with respect to the calix, superior; styles two, filiform, striated; stigmas simple. *Pericarp:* capsule two-celled. *Seeds:* two. *Observe.* The perianth might perhaps be taken for bractes; and then the flower would be entirely superior. ESSENTIAL CHARACTER. *Petals:* five, with a nectareous excavation at the base; capsule two-celled.—The only known species is,

1. Linconia Alopecuroidea. Leaves scattered in a sort of whorl, five or six together; subpetioled, linear, three-sided, stiffish, shining, an inch long, rugged at the angles; the uppermost ciliate. This is a shrub with wand-like branches, which are few in number, and determinate, irregular from the base of the fallen leaves, as in the fir tree; flowers at the ends of the branches, not however in bundles, but separate, lateral, sessile, the length of the leaves; corollas tenacious, flesh-coloured, or white.—Native of the Cape of Good Hope, in watery places among the mountains.

Lindera; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* none. *Corolla:* petals six, ovate, obtuse. *Stamina:* filamenta six, many times shorter than the corolla; antheræ minute. *Pistil:* germen ovate, smooth, superior; style upright, rather shorter than the corolla; stigmas two, reflex. *Pericarp:* capsule two-celled. *Seeds:* undescribed. ESSENTIAL CHARACTER. *Corolla:* six-petalled.——The only known species is,

1. Lindera Umbellata. Leaves aggregate at the ends of the branchlets, petioled, oblong, acute, entire, above green and smooth, underneath pale and villose, an inch long; petioles scarcely a line in length, villose above; stem shrubby, loose; branches and branchlets alternate, flexuose, smooth, spreading very much; flowers terminating in a simple many-

flowered umbel; peduncles a little hairy, unguicular; pedicels tomentose about half the length. The Japanese use the wood for making soft brushes to clean their teeth with.—Native of Japan.

Lindernia; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth five-parted; divisions linear, sharp, permanent. *Corolla:* one-petalled, ringent, two-lipped; under lip very short, concave, emarginated; lower lip upright, three-cleft; the middle one rather larger. *Stamina:* filamenta four, twin; the superior ones simple; the two inferior ascending, with a terminal upright tooth; antheræ twin, the inferior ones sublateral. *Pistil:* germen ovate; style filiform; stigma emarginated. *Pericarp:* capsule oval, one-celled, two-valved. *Seeds:* numerous. *Receptacle:* cylindric. ESSENTIAL CHARACTER. *Calix:* five-parted. *Corolla:* ringent, with the upper lip very short. *Stamina:* the two lower with a terminating tooth, and a sublateral antheræ. *Capsule:* one-celled.—The species are,

1. Lindernia Pyxidaria. Leaves sessile, quite entire; peduncles solitary; root annual; stem smooth, square, brittle, sometimes branched, and putting forth runners; flowers axillary, solitary, on a long slender peduncle; corolla pale blue. —Native of Virginia, in watery and boggy places; flowering in July and August. Hence it has migrated into Europe; and is now found in similar situations in Alsace and Piedmont.

2. Lindernia Dianthera. Leaves petioled, ovate, roundish, subserrate; stem creeping.—Annual, and a native of St. Domingo.

3. Lindernia Japonica. Leaves obovate, toothed, the lowest petioled; root annual; stem herbaceous, branched, weak; branches alternate, somewhat villose, from an inch to a span in length; flowers at the ends of the branches in racemes; corollas rufescent.—Native of Japan.

Linnæa; (so named by Gronovius, in honour of the illustrious Carl von Linné or Linnæus, a native of Sweden, and the prince of botanists;) a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth double. *Perianth of the fruit:* inferior, four-leaved; the two opposite leaflets very small, acute; the remaining two elliptic, concave, upright, hispid, embracing the germen, converging, permanent. *Perianth of the flower:* superior, one-leafed, five-parted, upright, narrow, sharp, equal. *Corolla:* one-petalled, bell-shaped, half five-cleft, obtuse, subequal, twice as large as the calix of the flower. *Stamina:* filamenta four, awl-shaped, inserted into the bottom of the corolla; of which two are very small, the two nearest longer; shorter than the corolla; antheræ compressed, versatile. *Pistil:* germen roundish, inferior; style filiform, straight, length of the corolla, declinate; stigma globose. *Pericarp:* berry juiceless, ovate, three-celled, covered by the hispid glutinous perianth of the fruit, deciduous. *Seeds:* two, roundish. ESSENTIAL CHARACTER. *Calix:* double, of the fruit two-leaved, of the flower five-parted, superior. *Corolla:* bell-shaped. *Berry:* dry, three-celled.——The only known species is,

1. Linnæa Borealis; *Two-flowered Linnæa.* Root perennial, fibrous; stems filiform, from three to six feet long, loose, creeping, round, perennial, ferruginous, with a few white hairs scattered over them; leaves opposite, roundish, ovate, spreading, attenuated into the petioles; branches alternate, simple, upright, with six or eight leaves on them; peduncles terminating the older branches, solitary, a finger's length, upright, having different hairs scattered over them, some very minute, reflex-pellucid, others spreading, secreting a glutinous juice; corolla turbinate, three times as long as the calix, smooth and white on the outside, having a few hairs scattered over it within, with blood-red veins within the cavity, which are yellow on the lower side. The smell of the flowers approaches to that of Ulmaria, or Meadow Sweet; and is so strong during the night, as to discover this little plant at a considerable distance. In Sweden, where the plant is common, an infusion of the leaves in milk is employed in the rheumatism. In Norway they cure the itch with a decoction of it. And in Ostrobothnia they apply it in a cataplasm, or by fomentation, to disorders of the feet in sheep.—Native of Sweden, Norway, Switzerland, Silesia, Italy, Russia, Siberia, and Canada, in large forests and woods, especially where moss abounds; and flowers in June. It has been discovered in an old fir-wood at Mearns, near Aberdeen in Scotland.

Linociera; a genus of the class Diandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth very small, four-toothed, obtuse, permanent. *Corolla:* petals four, equal, linear, channelled, upright, spreading at top, many times longer than the calix. *Stamina:* filamenta two, very short, rather broad; antheræ linear, two-furrowed, length of the corolla, upright, each adhering slightly to the other side of the two petals. *Pistil:* germen superior, ovate, four-cornered; style short; stigma oblong, two-cleft. *Pericarp:* berry ovate, sharp-pointed, two-celled. *Seeds:* solitary, oblong. ESSENTIAL CHARACTER. *Calix:* four-toothed. *Corolla:* four-petalled. *Antheræ:* connecting two opposite petals at the base. *Berry:* two celled.—Dr. Smith suggests, that by examining the fruit in an early state, it will be found that the Linociera of Schreber is not distinct from Chionanthus. See *Chionanthus.* There is but one species, Linociera Ligustrina, a native of open places in the West Indies.

Linum; a genus of the class Pentandria, order Pentagynia. —GENERIC CHARACTER. *Calix:* perianth five-leaved, lanceolate, upright, small, permanent. *Corolla:* funnel-form. *Petals:* five, oblong, gradually wider above, obtuse, more spreading, large. *Stamina:* filamenta five, awl-shaped, upright, length of the calix; (also five rudimenta, alternating;) antheræ simple, arrowed. *Pistil:* germen ovate; styles five, filiform, upright, length of the stamina; stigmas simple, reflex. *Pericarp:* capsule globose, rudely pentagonal, ten-valved, gaping at the tip; partitions membranaceous, very thin, connecting the valves. *Seeds:* solitary, ovate-flattish, acuminated, smooth. *Observe.* In many species, if not in all, the filamenta are united at the base: in the twenty-third, a fifth part is excluded. ESSENTIAL CHARACTER. *Calix:* five-leaved. *Petals:* five. *Capsule:* ten-valved, ten-celled. *Seeds:* solitary.—The species are,

* *With alternate Leaves.*

1. Linum Usitatissimum; *Common Flax.* Calices and capsules mucronate; petals crenate; leaves lanceolate; stem generally solitary; roots annual, simple, fibrous, pale brown; stem upright, eighteen inches, two feet, and even more, in height, round, smooth, leafy, branched only at top; flowers large, growing in a panicle, on round smooth peduncles; petals wedge-shaped, deciduous, sky-blue, streaked with deeper-coloured lines, white at the claws, and somewhat gnawed at the tip.—Flax is now found wild in many parts of Europe, in corn-fields. In England we cannot assert it to be aboriginal, though it is said to be very common in the western counties, not only in corn fields, but in pastures and on downs. It flowers in June and July. The plants of Flax, when crowded together in cultivation, rise only a foot and half high, with a slender unbranched stalk; yet when they are allowed room, will rise more than two feet high, and put out two or three side-branches towards the top, especially in

a good soil. There is a dwarf variety, which has stronger and shorter stalks, branching out more, the leaves broader, the flowers larger, with the petals indented at the extremity, the seed-vessels much larger, and the peduncles longer. This valuable plant is supposed to have been derived originally from those parts of Egypt which are exposed to the inundations. In the earliest record we have, *Exodus* ix. 31. flax is mentioned as a plant cultivated in that country; on which account antiquaries have been surprised to find the vestments of mummies made of cotton. It is highly probable, however, that mankind made thread of cotton before the use of flax was discovered; the former being produced in a state ready for spinning, whereas the latter requires a long process before it can be brought to that state. It is difficult, or perhaps impossible, to determine when the culture of flax was first introduced into this country. In the simplicity of ancient times, when families provided within themselves most of the necessaries and conveniencies of life, every garden supplied a proper quantity of hemp and flax. The macerating or steeping necessary to separate the fibres, by rotting the rest of the stalk, was found to render water so offensive, that by the 33rd of Henry VIII. it was enacted that no person should water any Hemp or Flax, in any river or stream, or in any common pond, where beasts are used to be watered. The seeds of flax, called Linseed, yield, by expression only, a large proportion of oil, which is an excellent pectoral, as is likewise the mucilaginous infusion. The oil is of a healing balsamic nature, and very useful in coughs, attended with spitting of blood, in colics, and obstinate costiveness. Outwardly applied, it softens and eases pain. The seeds in substance are used as poultices, to soften and ripen inflammatory tumors, and are well adapted for that purpose. The infusion is likewise a good medicine in the strangury, heat of urine, thin sharp defluctions on the lungs, and other similar disorders. An ounce of the seeds is a sufficient quantity for a quart of water; for if added in a larger quantity, they render the liquor disagreeably slimy. After the oil is expressed from the seeds, the remaining farinaceous part, called oil-cake, is given to oxen, who soon grow fat upon it. This oil differs in several respects from other expressed oils: it does not congeal in winter, nor does it form a solid soap with fixed alkaline salts, and it acts more powerfully as a menstruum upon sulphureous bodies. When heat is applied during the expression, it acquires a yellowish colour, and a peculiar smell. In this state it is used by painters and varnishers. It is well known that the fibres of the stem are manufactured into linen, and that this linen, when worn to rags, is made into paper. Flax in German is called *Flacks*, or *Lein;* in Dutch, *Vlasch;* in Danish, *Hörr* or *Härr;* in Norwegian, *Lün;* in Swedish and French, *Lin;* in Italian and Spanish, *Lino;* in Portuguese, *Linho;* in Russian, Polish, and all the languages from the Sclavonian, *Len*, or *Lan*. All the Europeans, except the Danes, use *Lin*, when speaking of the seed.—Flax requires a rich dry soil, or fat sandy loam, particularly that which is formed from the sediment of great rivers; hence old grass-land of this description is its most proper matrix. It is, however, not unfrequently sown on arable land; and, when the soil is in heart, dry, friable, and clean, with good success. Much depends on the state of the soil at the time of sowing. It should neither be wet nor dry, and the surface ought to be made as fine as that of a garden bed. For the crop should all rise together, and the surface should be evenly seeded. If the plants come up at several times, or if by accident or mismanagement they be thin upon the ground, the crop is irreparably injured. This will be the case in a severe season of drought, or when spring frosts are severe, or when the crop is attacked by a small white slug; or when the ground being full of clods, the seeds are not evenly dispersed, and not being able to pierce the clods, come up in circles round them, leaving vacancies in the centre favouring their early branching, than which nothing is more detrimental to the crop, the goodness of it depending much on its running up with a single stalk, for wherever it branches, the fibres terminate, and they are worked off in dressing. If the crop be intended for thread of the first quality, the time of pulling it is when the seeds are formed; but if they be suffered to ripen, the advantage gained by the seed is balanced by the inferior quality of the flax, the filamenta being harsh, and the cloth made from them not taking a good colour in whitening. It is also a great exhauster of the soil, when it stands for the seed to ripen. The flax crop interferes with harvest, and therefore ought to be confined to rich grass-land districts, where harvest is a secondary object, and where exhaustion may be rather favourable than hurtful to succeeding arable crops, by checking the too great rankness of the rich fresh-broken ground. It has been strongly recommended, instead of steeping the flax in ponds or other cold water, to separate the *boon* or pulp of the stalk, from the *harle* or fibrous part, which constitutes the flax, by boiling it in water. If this process should be found to answer as well as the common one, much time and labour would be saved, and the air and waters would not be poisoned, as they now are where flax and hemp are steeped. The flax would also in all probability be of a finer colour, and the operation of bleaching safer and less tedious; but whether the strength of the thread would be improved or diminished, experience only can decide. —The common mode of cultivating flax is as follows. In order to have the ground as clear from weeds as possible, it should be fallowed two winters, and one summer, and harrowed between each ploughing, particularly in summer, to destroy the young weeds soon after they appear. This will also break the clods by separating their parts, so that they will fall to pieces on being stirred. If the land should require dung, that ought not to be laid on till the last ploughing, when it must be buried in the ground: but this dung should be clear from seeds of weeds, which it may be by laying it in a heap, and fermenting it well. Just before the season for sowing the seed, the land is well ploughed, and laid very even. The seeds are sown at the end of March, or the beginning of April, when the weather is mild and warm. The seed is sown broad-cast, two to three bushels to an acre; but from many repeated trials, says Mr. Miller, I have found it a much better method to sow the seed in drills, at about ten inches' distance from each other, by which half the quantity of seed usually sown will produce a greater crop; and when the flax is thus sown, the seed may be easily hoed to destroy the weeds: if this operation be twice repeated in dry weather, it will keep the ground clean till the flax is ripe; this may be done at half the expense which hand-weeding will cost, and will not tread down the plants nor harden the ground, which by the other methods is always done; and it is absolutely necessary to keep the flax clean from weeds, otherwise they will overbear and spoil the crop. Towards the end of August, or the beginning of September, the flax will begin to ripen, and it must not stand to be over-ripe, but be pulled up by the roots as soon as the heads begin to change brown, and hang downwards, otherwise the seeds will soon scatter and be lost; so that the pluckers must be nimble in tying up the plants in handfuls, and setting them upright, till they are dry enough to be housed. If the flax be pulled when it first begins to flower, the thread will be whiter, but then the seed will be lost. The thread, however, will be stronger when

the flax is left till the seed is ripe, provided it does not stand too long; but the colour of it will not be so good. Some recommend sheep-feeding with the flax, when it is a good height, and affirm that they will eat the weeds and grass, and do the flax good; and that if they should beat it down, that it will rise again with the next rain. But this is a very wrong practice, for if the sheep gnaw the flax, it will shoot up very weak, and never attain to half the size it would have done if it had not been cropped; and if the sheep like the crop better than the weeds, they will devour that, and leave the weeds untouched.

2. Linum Perenne; *Perennial Flax.* Calices and capsules blunt; leaves lanceolate, quite entire. From its perennial root arise three or four inclining stalks, having short narrow leaves towards their base, but scarcely any about the top. The flowers are produced at the ends of the stalks, sitting very close; they are of a delicate texture, and very elegant blue colour. Mr. Miller distinguishes the upright Siberian plants. The stems of this are strong, in number according to the size of the root, in height from three to five feet according to the soil; they divide into several branches at top. The flowers are large, of a fine blue, appearing in June, and are succeeded by obtuse seed-vessels, ripening in September. He recommends the cultivating it for use; being perennial, earlier, more productive, and yielding a stronger though not so fine a thread.—Native of Cambridgeshire, Norfolk, Suffolk, and Northamptonshire, on calcareous pastures. This flax has been tried, and answers very well for making common strong linen, but the thread is not so fine or white as that which is produced from the common sort; but as the roots of this will continue many years, it will require little other culture, but to keep it clean from weeds, which cannot well be done, unless the seeds be sown in drills, that the ground may be constantly kept hoed to destroy the weeds when young. This sort must have the stalks cut off close to the ground when ripe, and then managed in the same way as the common sort; but it seldom produces more than three crops that will pay for standing.

3. Linum Monogynum; *One-styled Flax.* Calices acute; leaves linear-lanceolate, even; stem round, shrubby, and branched at the base; flowers one-styled.—Native of New Zealand, in Queen Charlotte's Sound.

4. Linum Viscosum; *Clammy Flax.* Leaves lanceolate, hairy, five-nerved; root woody, perennial.—Native of Germany.

5. Linum Hirsutum; *Hairy Flax.* Calices hirsute, acuminate, sessile, alternate; branch-leaves opposite; root woody, perennial; stems round, simple, hairy, from a foot to two feet in height; flowers on very short peduncles; petals blue, marked with lines.—Native of Austria and Hungary.

6. Linum Narbonnense; *Narbonne Flax.* Calix acuminate; leaves lanceolate, stiff, rugged, acuminate; stem round, branched at the base; filamenta connate; root perennial; stem from a foot to eighteen inches high, branching out almost to the bottom into many long slender branches; flowers at the ends of the branches.—Native of the south of France, Switzerland, and Italy. It flowers from May to July.

7. Linum Reflexum; *Reflex-leaved Flax.* Calices acuminate; leaves ovate-lanceolate, acuminate, reflex, even; filamenta connate; stem a foot high, round, woody, branched from the base; flowers in a sort of umbel, large, blue. It flowers in July.—Native of the south of Europe.

8. Linum Tenuifolium; *Fine-leaved Flax.* Calices acuminate; leaves linear, setaceous, rugged backwards; root perennial, woody, branching; stems ascending at the base; flowers in a sort of panicle, peduncled; petals rose-coloured, purple, or white, nearly twice as long as the calix.—Native of the south of Europe.

9. Linum Angustifolium; *Narrow-leaved Flax.* Calix obsoletely three-nerved; leaflets and capsule acuminate; leaves linear-lanceolate, three-nerved; stems numerous, a little inclined. This is very much allied to the first species.—Native of Cornwall and Devonshire, in dry sandy pastures, especially near the sea. It is also found at Dorsham in Suffolk; Minster in the isle of Sheppey; at Beacon Hill, and Deal in Kent; and near Hastings in Sussex.

10. Linum Gallicum; *Annual Yellow Flax.* Calices awl-shaped, acute; leaves linear-lanceolate; peduncles of the panicle two-flowered; flowers subsessile; root annual; flowers yellow.—Native of the south of France.

11. Linum Maritimum; *Sea Flax.* Calices ovate-acute, awnless; leaves lanceolate, the lower ones opposite; root perennial; stems herbaceous, round, almost upright, glaucous; petals yellow. It flowers in July and August.—Native of the south of Europe and the Levant.

12. Linum Alpinum; *Alpine Flax.* Calices rounded, blunt; leaves linear, sharpish; stems declinate; root perennial, branched; stems herbaceous, simple, half a foot or more in length; flowers peduncled, large; petals pale blue.—Native of Austria, Piedmont, Dauphiny, and Silesia.

13. Linum Austriacum; *Austrian Flax.* Calices rounded, blunt; leaves linear, sharp, straightish; root perennial, woody; stems herbaceous, annual, from six to eighteen inches long; peduncles one-flowered; petals white, purplish, blue or violet, with darker lines and a yellow claw. It flowers in June and July.—Native of Austria and the Palatinate.

14. Linum Virginianum; *Virginian Flax.* Calices acute, alternate; capsules awnless; panicle difform; leaves lanceolate; root-leaves ovate; stem filiform, a foot high, panicled; flowers on very short peduncles; corollas yellow.—Native of Virginia and Pennsylvania.

15. Linum Flavum; *Perennial Yellow Flax.* Calices subserrate-rugged, lanceolate, subsessile; panicle with dichotomous branches; root perennial, woody; stems herbaceous, upright, from six to eighteen inches high; flowers elegant, upright, on short peduncles, at the end of the branches, and at the divisions of them. The flowers open most in the morning, when the sun shines, and continue in succession during June, July, and part of August.

16. Linum Strictum; *Upright Flax.* Calices awl-shaped; leaves lanceolate, stiff, mucronate, rugged at the edge. This is an annual plant, with an upright stalk nearly a foot and half high.—Native of the south of France, Spain, and Sicily.

17. Linum Suffruticosum; *Shrubby Flax.* Leaves linear, acute, rugged; stems suffruticose. This has a shrubby stalk, a foot high, sending out several branches; flowers at the ends of the branches, erect, on long slender peduncles; petals large, entire, white, but before the flowers open pale yellow. They appear in July, but the seeds seldom ripen in England.—Native of Spain, about Aranjuez, but common in the kingdom of Valencia.

18. Linum Arboreum; *Tree Flax.* Leaves wedge-shaped; stems arborescent. This beautiful species forms (if not a tree, as its name imports,) a shrub of the height of several feet. It begins to flower in March, and continues flowering to the close of summer, but has not yet produced seeds in England.—Native of the island of Candia.

19. Linum Campanulatum. The base of the leaves dotted-glandular on both sides; stem simple, a finger long.—Native of the south of France, and of Russia.

** *With opposite leaves.*

20. Linum Africanum; *African Flax.* Leaves linear-lan-

ceolate; flowers terminating, peduncled; stem suffruticose, stiff, a foot high, round, with simple branches; flowers in a terminating umbel; petals yellow, with villose claws, and turning tawny. It flowers in June and July.—Native of Africa.

21. Linum Nodiflorum; *Knotted Flax.* Floriferous leaves opposite, lanceolate; flowers alternate, sessile; calices the length of the leaves; stem angular, even, bifid, or trifid; root perennial; corolla yellow.—Native of Italy.

22. Linum Catharticum; *Purging Flax.* Leaves ovate-lanceolate; stem dichotomous; corollas acute; root annual, very small; flowers terminating, solitary, pendulous before they open, then erect; petals white. It sometimes varies with four stamina and four styles. This small delicate species of flax, called also in some places *Mill Mountain*, is very common throughout England in dry hilly pastures, and flowers from the end of May to August. Gerarde celebrates this little plant as a purge. His receipt is a handful of the herb infused in a pint of warm white wine all night, and taken in the morning. Lewis prescribes an infusion in water or whey of a handful of the fresh leaves, or a drachm in substance of them dried. Dr. Withering recommends an infusion of two drachms or more of the dried herb, as an excellent purge in many obstinate rheumatisms; and adds, that it frequently acts as a diuretic.—Native of most parts of Europe.

23. Linum Radiola; *Least Flax*, or *All-seed.* Stem dichotomous; flowers four-stamined, four-styled; root annual; leaves sessile, ovate, acuminate; flowers upright, solitary, small, white. With us it is called *All-seed* and *Least Rupture Wort*, and is found on moist sandy heaths; flowering in July and August.—Native of many parts of Europe.

24. Linum Quadrifolia; *Four-leaved Flax.* Leaves in fours.—Native of the Cape of Good Hope.

25. Linum Verticillatum; *Whorl-leaved Flax.* Leaves in whorls. Annual; stems round, branched, not more than a foot high; flowers violet or blu egray.—Native of Italy, near Rome.

26. Linum Lewisii. Leaves of the calix ovate-acuminate; petals cuneate, rounded at the top; leaves lanceolate-linear, mucronate; stems lofty, numerous.—Found by Lewis in the valleys of the Rocky Mountains, and on the banks of the Missouri. The flowers are large and blue; it is a very good perennial; and Pursh thinks it would be useful if cultivated.

27. Linum Rigidum. Leaves of the calix ovate, acuminate, three-nerved, ciliate; petals oblong, very narrow; leaves stiffly erect, linear, short; flowers sulphur-yellow coloured. —This plant was discovered on the banks of the Missouri by Mr. Thomas Nuttall, to whose unwearied diligence the delightful science of Botany is already greatly indebted.

Lion's Foot. See *Catananche.*

Lion's Leaf. See *Leontice.*

Lion's Tail. See *Phlomis Leonurus.*

Liparia; a genus of the class Diadelphia, order Decandria. —GENERIC CHARACTER. *Calix:* perianth one-leafed, very obtuse at the base, half five-cleft, acute; the lowest division very long, elliptic, petal-like. *Corolla:* papilionaceous, without processes of the keel or wing; standard oblong, conduplicated, straight, the sides reflex; wings oblong, straight, narrower at the base, two-lobed at the lower margin. *Keel:* lanceolate, subascending, two-parted at the base. *Stamina:* filamenta diadelphious, simple and nine-parted, filiform, three shorter than the rest; antheræ ovate. *Pistil:* germen sessile, very short; style filiform, middling; stigma simple. *Pericarp:* legume ovate. *Seeds:* few. ESSENTIAL CHARACTER. *Calix:* five-cleft, with the lowest segment elongated. *Corolla:* wings two-lobed below. *Stamina:* the larger, with three shorter teeth. *Legume:* ovate. For their propagation and culture, see *Borbonia.*——The species are,

1. Liparia Splhærica; *Globe-flowered Liparia.* Flowers in heads; leaves lanceolate, nerved, smooth; stem four feet high, stout, smooth and even; corolla tawny. The manner in which the wings wrap round each other before the flower, which is remarkably handsome, opens, is very singular; head terminating.—Native of the Cape of Good Hope.

2. Liparia Graminifolia; *Grass-leaved Liparia.* Flowers in heads; leaves linear, alternate, acute, sessile; calices villose; stem shrubby, determinately branched, smooth and even, angular; head made up of a raceme; corolla yellow.—Native of the Cape of Good Hope.

3. Liparia Umbellata; *Umbelled Liparia.* Flowers umbelled; leaves lanceolate, smooth and even; corollas smooth; calices and bractes hairy. It is the same with *Borbonia Lærigata*, which see.

4. Liparia Villosa; *Woolly Liparia.* Flowers in heads; leaves ovate-acute, villose; branches round; corolla red.—Native of the Cape of Good Hope.

5. Liparia Sericea; *Silky Liparia.* Flowers subspiked; axillary; leaves oblong-ovate, acute, villose. Allied to the preceding.—Native of the Cape of Good Hope.

Lippia; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, compressed, four-toothed, bivalved when mature; valves membranaceous, acuminate, keeled, upright, permanent. *Corolla:* one-petalled, unequal; border four-cleft; divisions rounded, the inferior and superior one larger, the superior erect. *Stamina:* filamenta four, shorter than the corolla, two of them longer than the others; antheræ simple. *Pistil:* germen ovate, compressed, flat; style filiform, of the situation and length of the stamina; stigma oblique. *Pericarp:* none; valves of the calix the seeds. *Seeds:* solitary, oblong. *Observe.* Several fructifications are collected into a little head. ESSENTIAL CHARACTER. *Calix:* four-toothed, roundish, upright, compressed, membranaceous. *Capsule:* one-celled, two-valved, two-seeded, straight. *Seed:* two-celled.——The species are,

1. Lippia Americana. Heads pyramidal; height sixteen or eighteen feet, with a rough bark; branches and leaves in pairs; peduncles axillary, sustaining many pyramidal scaly heads, about the size of a large gray pea, in which are many small yellow flowers between the scales—Found at La Vera Cruz. These shrubs, being natives of the continent and islands of the West Indies, must be preserved in a bark-stove. The seeds should be sown on a hot-bed, and the plants treated as other shrubby plants from the same country; by keeping them always in the stove, plunged in the bark bed, observing to give them a large share of air in warm weather, and to refresh them frequently with water. In winter they must be watered more sparingly, and be kept in a moderate degree of warmth; otherwise they will not live through the winter, especially when young: but when they have acquired strength, they may be preserved with a less share of warmth. As the plants advance in their growth, shift them into larger pots; but this should not be too often repeated. Once every spring will be sufficient, for these and many other exotic plants do not thrive so well when frequently removed, as when they are permitted to fill the pots with their roots. Shift them in April; at which time the tan of the hot-bed should be stirred, and fresh tan mixed with it, to increase the heat. The earth in which these plants are placed should be light and fresh, but not too rich.

2. Lippia Hemisphærica. Heads hemispherical. This is

a shrub ten feet high, the whole odoriferous and aromatic; flowers small; corolla white.—Native of Carthagena, in New Spain.

3. Lippia Ovata. Heads ovate; leaves linear, quite entire. —Native place unknown.

4. Lippia Hirsuta. Hirsute: leaves oblong, wrinkled, serrate, tomentose underneath; panicles axillary; heads ovate; stem four-cornered; flowers minute, white.—Found in America by Mutis.

5. Lippia Cymosa. Flowers cymed; leaves ovate, almost entire. This shrub has often several stems from the same root, each no larger than a goose quill, round, and woody; the flowers come out at the top, they are small, and many together.—Native of Jamaica.

Liquidambar; a genus of the class Monœcia, order Polyandria.—GENERIC CHARACTER. *Male Flowers:* numerous, on a long conical loose ament. *Calix:* involucre common four-leaved; leaflets ovate, concave, caducous; the alternate ones shorter. *Corolla:* none. *Stamina:* filamenta numerous, very short, on a body convex on one side, flat on the other; antheræ upright, twin, four-furrowed, two-celled.—*Female Flowers:* at the base of the male spike, heaped into a globe. *Calix:* involucre as in the male, but double; perianths proper bell shaped, cornered, several, connate, warty. *Corolla:* none. *Pistil:* germen oblong, growing to the perianth; styles two, awl-shaped; stigmas growing on one side, length of the style, recurved, pubescent. *Pericarp:* capsules as many, ovate, one-celled, bivalve, at the tip acute, disposed into a globe, woody. *Seeds:* several, oblong, glossy, with a membrane at the point, mixed with a great many chaffy corpuscles. Gærtner has furnished us with the following *Emendations,—Pistil:* germina two, conjoined between each other, and with the perianth; style to each long, awl-shaped; stigma recurved. *Pericarp:* capsules twin, leathery, beaked, one-celled, gaping inwards. *Seeds:* several, oblong, glossy, compressed, ending in a little membrane. ESSENTIAL CHARACTER. *Male. Calix:* common, four leaved. *Corolla:* none. *Filamenta:* numerous. *Female. Calix:* in a globe, four-leaved. *Corolla:* none. *Styles:* two. *Capsules:* many in a globe, two-valved, many-seeded.——The species are,

1. Liquidambar Styraciflua; *Maple-leaved Liquidambar*, or *Sweet Gum.* Leaves palmate-lobed, with the sinuses of the base of the veins villose. The trunk of this tree is usually two feet in diameter, straight, and free from branches to the height of about fifteen feet; from which the branches spread and rise, in a conic form, to the height of forty feet and upwards from the ground. The leaves of this species are distinguished from those of the second, by the little tufts of hairs placed where the veins divide from the midrib. From between the wood and the bark issues a fragrant gum, which trickles from the wounded trees, and, by the heat of the sun, congeals into transparent drops, which the Indians chew as a preservative to their teeth. It is an excellent balsamic medicine, inferior to none, for the whites, and weaknesses occasioned by venereal disorders: it operates by urine, brings away gravel, and is beneficial in disorders of the lungs: it may be chewed in small quantities, like Gum Arabic; and smells so like Balsam of Tolu, that it is not easy to distinguish them. The bark of this tree is of singular use to the Indians, for covering their huts; the wood has a fine grain, and is beautifully variegated; but when wrought too green, is apt to shrink: to prevent which, no less than eight or ten years is sufficient to season the plants; after which, it forms excellent timber, and is used in wainscoting.—It is a native of clayey ground in North America. The seeds of this tree, if sown in the spring, commonly remain in the ground a whole year, before the plants come up; so that the surest way to raise them, is to sow the seeds in boxes or pots of light earth; which may be placed in a shady situation during the first summer, and be removed in autumn to where they can have more sun: but if the winter should prove severe, it will be proper to cover them with pease-haulm, or other light covering; which ought constantly to be removed in mild weather. In the succeeding spring, if these boxes or pots be placed upon a moderate hot-bed, it will cause the seeds to come up early, so that the plants will have time to get strength before the winter; but during the two first winters, it will be proper to screen them from severe frost, as they will afterwards bear the cold very well.

2. Liquidambar Imberbe; *Oriental Liquidambar.* Leaves palmate-lobed, with the sinuses of the base of the veins smooth. —Native place unknown.

Liquorice. See *Glycyrrhiza.*

Liquorice Vetch. See *Astragalus.*

Liquorice, Wild. See *Abrus.*

Liriconfancy. See *Convallaria Maialis.*

Liriodendron; a genus of the class Polyandria, order Polygynia.—GENERIC CHARACTER. *Calix:* involucre proper two-leaved; leaflets triangular, flat, deciduous; perianth three-leaved; leaflets oblong, concave, spreading, petal-form, deciduous. *Stamina:* filamenta numerous, shorter than the corolla, linear, inserted into the receptacle of the fructification; antheræ linear, growing longitudinally to the sides of the filamentum. *Pistil:* germina numerous, disposed into a cone; style none; stigma to each globose. *Pericarp:* none; seeds imbricated into a body resembling a strobile. *Seeds:* numerous, ending in a lanceolate scale, emitting an acute angle towards the base of the scale from the inner side, compressed at the base, acute. ESSENTIAL CHARACTER. *Calix:* three-leaved. *Petals:* six seeds imbricated into a strobile.——The species are,

1. Liriodendron Tulipifera; *Common Tulip Tree.* Leaves lobed. Mr. Marshall describes the tulip-tree as seventy or eighty feet in height. He mentions two varieties, one with yellow, and the other with white wood: the first soft and brittle, much used for boards, and heels of shoes, also for turning into bowls, trenchers, &c. the white heavy, tough, and hard, sawed into joist boards, &c. for buildings. He remarks that the flower has sometimes seven petals, or more. The young shoots of this tree are covered with a smooth purplish bark; they are garnished with large leaves, the footstalks of which are four inches long. The flowers are produced at the end of the branches; they are composed of six petals, three without, and three within, which form a sort of bell-shaped flower: whence the inhabitants of North America give it the title of Tulip. These petals are marked with green, yellow, and red spots, making a fine appearance when the trees are well charged with flowers. The time of this tree's flowering is in July; and when the flowers drop, the germen swells, and forms a kind of cone: but these do not ripen in England. Catesby, in his *Natural History of Carolina,* says, there are some of these trees in America, which are thirty feet in circumference, making several bends or elbows; which render the trees distinguishable at a great distance, even when they have no leaves on them. They are found in most parts of the northern continent of America, from the Cape of Florida to New England; where the timber is of great use, particularly for making of periauguas, their trunks being large enough to be hollowed into the shape of those boats; so they are of one piece. Kalm observes, that it is very agreeable at the end of May to see one of these large trees with its singular leaves, and covered for a fortnight toge-

ther with flowers, which have the shape, size, and partly the colour, of tulips: the wood is used for canoes; whence the Swedes in North America call it Canoe-tree. He speaks of having seen a barn of considerable size, the sides and roof of which were made of a single tulip-tree split into boards. But one inconvenience attends it, for there is no wood that contracts and expands itself so much as this. The bark is divisible into very thin laminæ, which are tough, like fibres of bass-mats: it is pounded, and given to horses that have the bots. The roots are supposed to be as efficacious in agues as Jesuit's bark.—One of the handsomest trees of this kind is in the garden of Mr. Jones, at Waltham Abbey.—This tree is propagated by seeds, which are annually imported in great plenty from America. They may either be sown in pots or tubs filled with light earth from the kitchen-garden, or in a bed in the full ground: those which are sown in the first way may be placed on a gentle hot-bed, which will forward their growth, so that the plants will acquire more strength before winter. When they are thus treated, the glasses of the hot-bed should be shaded from the sun every day, and the earth in the pots should be frequently refreshed with water; for unless it is kept moist, the seeds will not grow: but this must be done with care, so as not to make it too wet, which will rot the seeds. When the plants appear, they must be still shaded in the heat of the day from the sun; but fresh air must be admitted daily, to prevent their drawing up weak; and as the season advances, they must be gradually hardened, to bear the open air. While the plants are young, they do not require much sun, and should be either shaded, or placed where the morning sun only shines upon them; they must also be constantly supplied with water, but not have it in too great plenty. As the young plants commonly continue growing late in the summer, so when there happens early frosts in autumn, it often kills their tender tops, which occasions their dying down a considerable length in winter; therefore they should be carefully guarded against these first frosts, which are always more hurtful to them than harder frosts afterwards, when their shoots are better hardened: however, the first winter after the plants come up, it will be the better way to shelter them in a common hot-bed frame, or to arch them over with hoops, and cover them with mats; exposing them always to the open air in mild weather. The following spring, just before the plants begin to shoot, they should be transplanted into nursery-beds, in a sheltered situation, where they are not too much exposed to the sun. The soil of these beds should be a soft gentle loam, not too stiff, nor over light; this should be well wrought, and the clods well broken and made fine. Great care must be taken not to break the roots of the plants, in taking them up, for they are very tender; they should be planted again as soon as possible; for if their roots are long out of the ground, they will be much injured thereby.—These may be planted in rows at about a foot distance, and at six inches' distance in the rows: for as they should not long remain in these nursery-beds, so this will be room enough for them to grow; and by having them so close, they may be shaded in the summer, or sheltered in the winter with more ease than when they are farther apart. When the plants are thus planted, if the surface of the beds is covered with rotten tanner's bark, or with moss, it will prevent the earth from drying too fast; so that the plants will not require to be so often watered, as they must be where the ground is exposed to the sun and air: after this, the farther care will be to keep them clean from weeds; and if the latter part of summer should prove moist, it will occasion the plants to grow late in autumn; so the tops will be tender, and liable to be killed by the first frosts: in this case they should be covered with mats, to protect them. If the plants make great progress the first summer, they may be transplanted again the following spring; part of them may be planted in the places where they are to remain, and the other should be planted in a nursery, where they may grow two or three years to acquire strength, before they are planted out for good: though the younger they are planted in the places where they are to stand, the larger they will grow, for the roots run out into length, and when they are cut, it greatly retards their growth: so that these trees should never be removed when large; for they rarely succeed, when they are grown to a large size, before they are transplanted. When the seeds are sown upon a bed in the full ground, the bed should be arched over with hoops, and shaded in the heat of the day from the sun, and frequently refreshed with water; as also should the plants when they appear: for when they are exposed much to the sun, they make small progress. The care of these in summer must be to keep them clean from weeds, supplying them duly with water, and shading them from the sun in hot weather: but as these seeds will not come up so soon as those which were placed on a hot-bed, they generally continue growing later in autumn, and will therefore be sheltered from the early frosts; for as their shoots will be much softer than those of the plants which had longer time to grow, so if the autumnal frosts should prove severe, they will be in danger of being killed down to the surface of the ground; by which the whole summer's growth will be lost, and the unprotected plants are sometimes entirely killed by the first winter. As these plants will not have advanced so much in their growth as the other, they should remain in the seed-bed, to have another year's growth, before they are removed; therefore all that will be necessary the second year, is to keep them clean from weeds. After the plants have grown two years in the seed beds, they will be strong enough to remove; therefore in the spring, just at the time when their buds begin to swell, they should be carefully taken up, and transplanted into nursery beds, and treated in the same way as has been before directed for the plants raised upon a hot-bed. There are some persons who propagate this tree by layers, which are commonly two or three years before they take root; and the plants so raised seldom make such straight trees as those raised from seed, though indeed they will produce flowers sooner; as is always the case with stinted plants. This tree should be planted on a light loamy soil; on which, when not too dry, it will thrive much better than upon a strong clay, or a dry gravelly ground: for in America they are chiefly found upon a moist light soil, growing to a prodigious size. It will not however be proper to plant these trees in a soil which is too moist in England, which might rot the fibres of the roots, by the moisture continuing too long about them; especially if the bottom be clay, or a strong loam, which will detain the wet. To raise them in the open ground, at the beginning of March prepare a bed of good mellow rich earth well mixed with old rotten cow-dung, exposed to the sun, and sheltered from cold winds: place an old frame over the bed; and having sown the seeds, sift over them, half an inch thick, a soil composed some months before, of one load of old pasture earth, one of well rotted cow-dung, and half a load of sea or fine pit sand. Some of these seeds will probably make their appearance in nine or ten weeks, but much the greater part will lie in the ground till next spring. Water the beds therefore no more than barely sufficient to cherish the plants that have appeared: for four or five weeks screen them from the sun during the heat of the day, but afterwards let them receive its full influence. During bad weather in winter throw double mats over the frames. In March, the succeeding year, pick off all mossy hard-crusted earth from the bed,

smooth it, and sift on some fine rich mould. At the end of April, or the beginning of May, plants will appear in abundance; when they must be frequently, but gently, watered. Till the beginning of August, they must be screened from a mid-day sun by part of an old reed-fence, or by nailing some thin boards together, high enough to shade the bed: after this, it will only be necessary to give them frequent moderate waterings, and to throw a mat over the frame during any severe winter storm. At the beginning of April, in the next season, take up the plants with a trowel, without bruising the roots; and if they cannot be planted immediately, mix a pailful of sifted mould and water to the consistence of pap; draw the plants through it, till as much adhere as will cover their roots and fibres: in this condition they may be kept several days out of the ground. Cut only a little of the tap-roots smoothly off, but let all the fibres remain; and then plant them in drills cut out with the spade, at a foot distance row from row, and six inches in the row: plant five of these lines, and then leave an alley three feet wide; water them frequently and plentifully during the summer months; throw mats over them, in case of very severe frost in the first winter, and let them remain two years. Then remove them to another nursery, in rows three feet and a half distant, and eighteen inches in the row, and let them continue three years; at the end of which, they will be of a good size for planting where they are to remain. No tree bears pruning its roots and branches worse than this; none however surpasses it in beauty and stateliness: so that it deserves a place in all noble and elegant plantations.

2. Liriodendron Liliifera. Leaves lanceolate. This is a middle-sized tree, with spreading branches; flowers pale, large, scentless, heaped at the ends of the branches, one on a peduncle.—Native of China near Canton, and of Amboyna.

Lisianthus; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth five-parted; leaflets lanceolate, keeled, membranaceous on the margin, very short, permanent. *Corolla:* one-petalled, funnel-form; tube long, somewhat ventricose, straitened at the base within the calix; border five-parted; divisions lanceolate, shorter than the tube, recurved. *Stamina:* filamenta five, filiform, longer than the tube; antheræ ovate, incumbent. *Pistil:* germen oblong, sharp-pointed; style filiform, length of the stamina, permanent; stigma headed, two-plated. *Pericarp:* capsule oblong, acuminate, two-celled; the margins of the valves intorted. *Seeds:* numerous. ESSENTIAL CHARACTER. *Calix:* keeled. *Corolla:* with a ventricose tube, and recurved divisions. *Stigma:* two-plated; capsule two-celled, two-valved; the margins of the valves intorted. ——The species are,

1. Lisianthus Longifolius. Leaves lanceolate; segments of the corolla lanceolate, acute. This elegant little plant rises generally to the height of fourteen or sixteen inches, or more: the flowers are large, and appear at the ends of the branches. —Native of Jamaica, in a dry, sandy, but cool soil. All the plants of this genus require to be kept in the bark-stove.

2. Lisianthus Cordifolius. Leaves cordate; segments of the corolla lanceolate, acute. This is said to be a variety of the preceding.—Native of Jamaica. See the preceding.

3. Lisianthus Exsertus. Leaves ovate-lanceolate, peduncles trichotomous; genitals very long.—Native of Jamaica. See the first species.

4. Lisianthus Latifolius. Leaves lanceolate-elliptic, acuminate; peduncles trichotomous; segments of the corolla erect, genitals included.—Native of Jamaica. See the first species.

5. Lisianthus Umbellatus. Leaves elongated, obovate; flowers terminating, peduncled, umbelled; segments of the corolla very short, blunt, upright.—Native of Jamaica. See the first species.

6. Lisianthus Frigidus. Leaves ovate, acuminate, coriaceous; panicle terminating, trichotomous; corollas ventricose, with rounding segments.—Native of the mountains of Guadaloupe. See the first species.

7. Lisianthus Sempervirens. Leaves lanceolate-elliptic; segments of the corolla ovate, blunt. See *Bignonia Sempervirens:* it is the same plant.

8. Lisianthus Glaber. Smooth: leaves ovate, petioled; corymbs terminating; stem upright, branched, round, leafy; flowers on few-flowered simple umbels; corolla yellow.—Found by Mutis in South America. See the first species.

9. Lisianthus Chelonoides. Smooth; leaves opposite, subconnate, oblong; panicle terminating, dichotomous, racemose; stem herbaceous, simple, round, smooth, from two to three feet high; flowers alternate, remote, directed one way, pendulous, yellow. The herb is very bitter, and strongly purgative.—Native of Surinam. See the first species.

Lita; a genus of the class Pentandria, order Monogynia. —GENERIC CHARACTER. *Calix:* perianth one-leafed, tubular, erect, coloured, five-cleft, sharp, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindric, very long, enlarged at the base and tip; border five-cleft; divisions ovate, spreading. *Stamina:* filamenta none; antheræ five, twin, in the throat of the corolla. *Pistil:* germen oblong; style filiform, length of the tube; stigma headed, truncated. *Pericarp:* oblong, one-celled, two-valved. *Seeds:* numerous, sawdust-like, affixed to the margins of the valves. *Observe.* This genus is allied to to Gentiana, but differs in the corolla, pistil, and fruit. ESSENTIAL CHARACTER. *Calix:* five-cleft, with two or three scales at the base. *Corolla:* salver-shaped, with a very long tube, dilated at the base and throat; border five-cleft; antheræ twin, inserted in the throat; capsule one-celled, two-valved. *Seeds:* numerous.——The species are,

1. Lita Rosea. Flowers in pairs; segments of the corolla acute; root tuberous, fibrous, about a foot deep in the ground; stem knobbed, quadrangular; corolla rose-coloured. —It grows wild in Guiana, where the root, which much resembles potatoes, is eaten by the inhabitants. It flowers in May.

2. Lita Cœrulea. Flowers in pairs; segments of the corolla rounded; colour of the corolla blue. It flowers in May.— Native of Guiana.

Lithophila; a genus of the class Diandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth three-leaved; leaflets lanceolate, sharp. *Corolla:* petals three, ovate-lanceolate, upright, converging, length of the leaflets of the calix; nectary two-leaved; leaflets opposite, smaller than the corolla, keeled, acute, upright, compressed. *Stamina:* filamenta two, awl-shaped, upright from the base of the germen, of the length of the nectary; antheræ roundish. *Pistil:* germen roundish, superior; style upright, length of the stamina; stigma obtuse, emarginate. *Pericarp:* two-celled. *Seed:* undivided. ESSENTIAL CHARACTER. *Calix:* three-leaved. *Corolla:* three-petalled. *Nectary:* two-leaved.——The only species known is,

1. Lithophila Muscoides.—Native of Navaza.

Lithospermum; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth five-parted, oblong, straight, sharp, permanent; divisions awl-shaped, keeled. *Corolla:* one-petalled, funnel-form, length of the calix; tube cylindric; border half five-cleft, obtuse, upright; throat perforated, naked. *Stamina:* filamenta five, very short; antheræ oblong, incumbent, covered.

Pistil: germina four; style filiform, length of the stamina; stigma obtuse, emarginate. *Pericarp:* none; calix grown larger, upright, containing the seeds in its bosom; seeds four, rather oblong, obtuse, gibbous. ESSENTIAL CHARACTER. *Calix:* five-parted. *Corolla:* funnel-form, perforated at the throat, naked.——The species are,

1. Lithospermum Officinale; *Common* or *Officinal Gromwell, Gromill,* or *Graymill.* Seeds smooth and even; corollas scarcely longer than the calix; leaves lanceolate; root perennial, strong; stems erect, roundish. The seeds operate powerfully as a diuretic, and are said to be serviceable in the stone, gravel, and most other obstructions: the best method of giving them is in barley-water, after having reduced them to a fine powder.—Native of most parts of Europe, in dry, gravelly, and chalky soils. It flowers in May and June. All the plants of this genus may be cultivated, by sowing their seeds soon after they are ripe in a bed of fresh earth, allowing them room, and keeping them clear from weeds. They will thrive in almost any soil and situation; and where the seeds are permitted to scatter, generally rise without care. The sixth and seventh are handsome, and worth cultivating.

2. Lithospermum Arvense; *Corn* or *Bastard Gromwell.* Seeds ovate, wrinkled; calicine leaflets lanceolate; corollas scarcely longer than the calix; leaves lanceolate, sharpish, hispid; root annual, small, and not much branched: its bark abounding with a deep red dye, which stains paper and linen, and is easily communicated to oily substances; hence it is sometimes called Bastard Alkanet. Linneus, in his *Flora Snecica,* informs us, that the country girls in the north of Sweden use the root to stain their faces on days of festivity.—It is common in corn-fields, and waste places; flowering from May to July. See the first species.

3. Lithospermum Incanum; *Hoary Gromwell.* Seeds rough; spikes terminating, compound, contracted; leaves linear, villose.—This is a shrubby species, found in Teautea and Savage Islands. See the first species.

4. Lithospermum Virginianum; *Virginian Gromwell.* Corollas larger than the calix, acute, rough-haired on the outside; leaves ovate, acute, hispid, nerved; root perennial; corolla white.—Native of Virginia and Maryland. See the first species.

5. Lithospermum Tinctorum; *Dyer's Gromwell.* Seeds smooth and even; spike solitary, terminating, directed one way; bractes lanceolate; leaves linear-lanceolate, blunt; root fusiform, two inches long, annual; stems several.—Native of Egypt.

6. Lithospermum Orientale; *Yellow Gromwell,* or *Bugloss.* Flowering branches lateral; bractes cordate, embracing; stem barren, upright: perennial.—It flowers in May and June; and is a native of the Levant. See the first species.

7. Lithospermum Purpuro-cœruleum; *Creeping Gromwell.* Seeds smooth and even; corollas twice as long as the calix; leaves lanceolate, somewhat hairy; the long woody perennial root produces many round, hairy, leafy stems, most of which are procumbent, and throw out roots; corolla first purple, then blue, with a pale reddish tube.—Native of most of the temperate parts of Europe: found near Taunton, in Somersetshire, and near Denbigh, in North Wales; also in a chalky soil near Greenhithe, in Kent. See the first species.

8. Lithospermum Tenuiflorum. Corollas filiform; leaves linear-lanceolate, strigose; stem upright.—Native of Egypt. See the first species.

9. Lithospermum Fruticosum; *Shrubby Gromwell.* Shrubby: Leaves linear, hispid; stamina equalling the corolla; root perennial, running deep into the ground; stem upright, shrubby, from two to three feet high, pretty closely set with hairs.—Native of the south of Europe, and the Levant. See the first species.

10. Lithospermum Callosum. Leaves lanceolate-linear, callous, warted, hispid; stem suffruticose, hispid.—Native place unknown. See the first species.

11. Lithospermum Ciliatum. Leaves ovate, hoary, callous at the edge, ciliate; stem suffruticose, muricated, hispid. It is a small, stiff, upright shrub, a span in height.—Native place unknown. See the first species.

12. Lithospermum Dispermum. Seeds only two; calices spreading; root annual; stem herbaceous, a hand high; corolla bluish white, small.—Native of Spain, between Madrid and Cadiz. See the first species.

13. Lithospermum Latifolium. Seeds turgidly ovate, lucid, cavo-punctate; leaves ovate-oblong, nervous; flowers pale yellow.—Found in shady woods from Virginia to Kentucky.

14. Lithospermum Angustifolium. Seeds the same as the preceding; flowers lateral, white; leaves linear, adpresso-pubescent; stem prostrate.—It grows in shady woods in the vicinity of the river Ohio.

15. Lithospermum Apulum. Seeds muricate; spikes terminal, fruitful; bractes lanceolate; leaves linear-lanceolate, acute; flowers yellow, very small.—It grows in the dry woods of Virginia, and in the neighbourhood of the rivers Ohio and Mississippi.

Littorella; a genus of the class Monœcia, order Tetrandria.—GENERIC CHARACTER. *Male. Calix:* perianth four-leaved, upright. *Corolla:* one-petalled; tube the length of the calix; border four-parted, upright, permanent. *Stamina:* filamenta four, filiform, very long, inserted into the receptacle; antheræ heart-shaped. *Female,* in the same plant. *Calix:* none. *Corolla:* one-petalled, conic, with slightly four-cleft mouth; permanent. *Pistil:* germen oblong; style filiform, very long; stigma acute. *Pericarp:* the investing corolla. *Seed:* nut one-celled. *Observe.* The flower is that of Plantain, but the fruit different. ESSENTIAL CHARACTER. *Male. Calix:* four leaved. *Corolla:* four-cleft. *Stamina:* long. *Female. Calix:* none. *Corolla:* slightly four-cleft. *Styles:* long. *Seed:* a nut.——The only known species is,

1. Littorella Lacustris; *Plantain Shoreweed.* The roots shoot out long running fibres, which take root afresh, and thus in a short time cover the brink of the lakes with tufts of semi-cylindrical, linear, acute leaves, about two inches long.—Native of the north of Europe, on the shores of lakes. It has been observed on Hounslow Heath; near Lowestoff, in Suffolk; at Hoseley-lough, in Northumberland; is common in Scotland, and some parts of Wales, and on the margins of all the gravelly-shored lakes in Ireland.

Live-in-Idleness. See *Viola.*

Live-long. See *Telephium.*

Liver Wort. See *Lichen Caninus.*

Lizard's Tail. See *Saururus.*

Loasa; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth five-leaved, superior, permanent; leaflets lanceolate, very spreading, with reflex sides. *Corolla:* petals five, obovate, hooded, large, extremely spreading, narrowed at the base into claws; nectary of five leaflets, alternating with the petals, converging into an acute cone, rather shorter than the calix, lanceolate, rugose, awned with a double filamentum. *Stamina:* filamenta numerous, capillary, longer than the nectary, from fifteen to seventeen to each petal; antheræ incumbent, roundish. *Pistil:* germen subovate, seed-bearing; style filiform, upright, the length of the stamina; stigma simple, obtuse. *Pericarp:*

capsule top-shaped, one-celled, three-valved at the tip; valves semi-ovate, acute, spreading. *Seeds:* a great many, ovate, small; receptacles three longitudinal lines running from the bottom of the capsule to the incisures of the valves. *Observe.* In point of affinity it approaches *Mentzelia;* in habit and situation of the germen and seeds, it approaches the Cucurbitaceous plants. ESSENTIAL CHARACTER. *Calix:* five-leaved, superior. *Corolla:* five-petalled; petals hooded; nectary five-leaved, converging; capsule turbinate, one-celled, three-valved, many-seeded.——The only known species is,

1. Loasa Hispida. This is an elegant annual plant, rising from a fibrous white root, the thickness of the little finger; stems round, whitish-green, marked here and there with short brown longitudinal lines; flowers handsome, but scentless; petals yellow.—Native of South America.

Lobelia; a genus of the class Syngenesia, order Monogamia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-cleft, very small, growing round the germen, withering; toothlets nearly equal, the two superior ones looking more upward. *Corolla:* one-petalled, irregular; tube cylindric, longer than the calix, divided longitudinally above; border five-parted; divisions lanceolate, of which the two superior ones are smaller, less reflex, more deeply divided, constituting an upper lip, the three inferior ones more spreading, frequently larger. *Stamina:* filamenta five, awl-shaped, the length of the tube of the petal, connate above; antheræ connate into an oblong cylinder, gaping five ways at the base. *Pistil:* germen sharp-pointed, inferior; style cylindric, length of the stamina; stigma obtuse, hispid. *Pericarp:* capsule ovate, two or three celled, two or three valved, gaping at the top, girt by the calix; dissepiments contrary to the valves. *Seeds:* a great many, very small; receptacle conic. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Corolla:* one petalled, irregular. *Capsule:* inferior, two or three-celled.——The species are,

* *With entire Leaves.*

1. Lobelia Simplex; *Slender Lobelia.* Stem upright; leaves linear, quite entire; peduncles solitary. It is a small annual plant, scarcely a hand high.—Native of the Cape of Good Hope. See the thirty-eighth species.

2. Lobelia Columneæ; *Mealy Lobelia.* Leaves oblong, blunt, revolute, very much wrinkled, shining above, tomentose beneath; branch or stem somewhat woody, angular, tomentose, mealy.—Native of New Granada.

3. Lobelia Bellidifolia; *Daisy-leaved Lobelia.* Stem upright, panicled; leaves obovate, crenate.—Native of the Cape of Good Hope. See the thirty-eighth species.

4. Lobelia Pinifolia; *Pine-leaved Lobelia.* Shrubby: leaves linear, clustered, quite entire; flowers many, small, blue; they are found at the tops of the twigs, among the leaves.—Native of the Cape of Good Hope. See the thirty-eighth species.

5. Lobelia Dortmanna; *Water Lobelia,* or *Gladiole.* Leaves linear, two-celled, quite entire; stem almost naked, erect, round, hollow, smooth; flowers about nine, in a loose spike, above the water; corolla white, faintly tinged with blue. Linneus remarks, that the whole plant, even the leaves beneath the water, are milky, and that the flowering-stalk is of a length proportional to the depth of water in which the plant grows. It flowers in July and August.—Native of the north of Europe, in mountain lakes: hence it is found in Wales, Westmoreland, Cumberland, and Scotland. See the twenty-fourth species.

6. Lobelia Tupa. Leaves lanceolate, quite entire; raceme spiked. The root and herb of this species are a violent poison.—Native of Peru.

7. Lobelia Kalmii. Stem upright; leaves lanceolate-linear, bluntish, alternate, quite entire; raceme terminating, a foot high; corolla blue.—Annual, and a native of Canada. See the twenty-fourth species.

8. Lobelia Paniculata; *Panicled Lobelia.* Leaves linear, quite entire, panicled, dichotomous.—Native of the Cape of Good Hope. See the thirty-eighth species.

9. Lobelia Grandis; *Great Lobelia.* Leaves oblong, quite entire, smooth; corymbs bracted; corollas hispid.—Native of South America.

10. Lobelia Ferruginea; *Rust-coloured Lobelia.* Stem villose; leaves lanceolate, serrate, acute, where the veins anastomoze rust-coloured-tomentose on both sides; genitals elongated.—Native of America.

11. Lobelia Chinensis; *Chinese Lobelia.* Leaves lanceolate, quite entire; flowers solitary, terminating; stem creeping; corolla pale blue.—Native of China, near Canton.

12. Lobelia Cornuta; *Horned Lobelia.* Leaves ovate, petioled; stamina very long. It is distinguished by its horned form, and the great length of the stamina.—Native of Cayenne.

13. Lobelia Fulgens. Plant erect, simple, subpubescent; leaves elongate-lanceolate, attenuate, very entire; raceme multiflorous.—It grows on the banks of the Mississippi. This species exceeds in splendour of colour, and size, the Lobelia Cardinalis.

** *With an upright Stem, and gashed Leaves.*

14. Lobelia Phyteuma. Leaves ovate-oblong, crenate; stem almost naked, spiked; antheræ hirsute, distinct.—Native of the Cape of Good Hope. See the thirty-eighth species.

15. Lobelia Bulbosa; *Tuberous-rooted Lobelia.* Stem upright; lower leaves pedate.—Native of the Cape of Good Hope. See the thirty-eighth species.

16. Lobelia Triquetra; *Tooth leaved Lobelia.* Stem upright; leaves lanceolate, toothed; raceme terminating, leafless. It flowers from May to September.—Native of the Cape of Good Hope. See the thirty-eighth species.

17. Lobelia Longiflora; *Long-flowered Lobelia.* Leaves lanceolate, toothed; peduncles very short, lateral; tube of the corolla filiform, very long. This is an annual herbaceous elegant plant, seldom above fourteen or sixteen inches high; stem upright; corolla handsome, white. It is altogether very poisonous, and brings on an invincible purging. If, after handling it, the hand be unawares applied to the eyes or lips, it brings on an inflammation. Horses are said to burst with eating it: whence in the Spanish West Indies it is called *Reventa Cavallos.* It is well known in Dominica under the name of *Quedec.* It is also a native of Jamaica, Cuba, and Martinico, by rivulets, and in moist cool shady places. It flowers from June to August.—The seeds of this plant should be sown, after it is ripe, in pots filled with rich earth, and plunged into the tan-bed in the stove, observing to refresh the earth frequently with water. In the spring, these pots may be removed, and plunged into a hot-bed, which will soon bring up the plants: when they are fit to remove, they should be each transplanted into a separate small pot filled with rich earth, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; then they may be treated in the same way as other tender plants from the same country, in allowing them a large share of air in warm weather, and frequently refreshing them with water. In autumn the plants must be plunged into the tan-bed of the stove, where they will flower the following summer, and produce ripe seeds; soon after which the plants will decay. If the seeds of this plant are brought from the West Indies, they should be sown, as soon as they arrive, in pots filled with rich earth: and if it happen in the winter, the pots should be

plunged into the tan-bed in the stove; but if it be in the spring or summer, they may be plunged into a hot-bed in the common frames. These seeds, when sown in the spring, seldom grow the same year; therefore, the following autumn, the pots should be removed into the stove, and managed according to the above directions.

18. Lobelia Tomentosa; *Downy Lobelia.* Straight, tomentose; leaves linear, toothed; peduncles terminating, very long, one or two flowered.—Native of the Cape of Good Hope. See the thirty-eighth species.

19. Lobelia Secunda. Upright, smooth; lower leaves oblong, toothed; upper lanceolate, entire; peduncles racemed, directed one way.—Native of the Cape of Good Hope. See the twenty-fifth species.

20. Lobelia Assurgens; *Tree Lobelia.* Leaves broad-lanceolate, serrate, toothletted, and decurrent below; racemes compound, terminating; root perennial; stem herbaceous, three or four feet high; flowers numerous, heaped, blood-red, very large.—Native of the cooler mountains of Jamaica. For its propagation and culture, see the sixteenth species.

21. Lobelia Patula; *Spreading Lobelia.* Herbaceous, diffused, virgate, smooth: leaves ovate-toothed; peduncles lateral.—Native of the Cape of Good Hope. See the thirty-fourth species.

22. Lobelia Acuminata; *Pointed-leaved Lobelia.* Stem upright, suffruticose; leaves lanceolate, attenuated, serrulate; raceme terminating, many-flowered; flowers yellow.—Native of the lower shady hills of Jamaica. For its propagation and culture, see the seventeenth species.

23. Lobelia Stricta. Stem suffruticose; lower leaves ovate-lanceolate, smooth, toothletted, and prickly at the edge; raceme terminating, spiked.—Native of the island of Guadaloupe. See the seventeenth species.

24. Lobelia Cardinalis; *Scarlet Lobelia,* or *Cardinal's Flower.* Stem upright, herbaceous; leaves oblong-lanceolate, serrate, somewhat villose; flowers in a sort of spike; calices smooth; segments quite entire. The stalk is terminated by a spike or raceme of flowers of an exceedingly beautiful scarlet colour. They appear at the end of July and in August, when they make a fine appearance for a month or more; and, when the autumn proves favourable, they will produce good seeds here. It grows naturally by the side of rivers and ditches in North America.—Both this and the next are propagated by seeds, which, when they ripen in England, should be sown in autumn in pots filled with rich kitchen-garden earth, and placed under a common hot-bed frame; or, if the seeds come from their native countries, sow them as soon as they arrive, for if kept out of the ground till spring, they will lie a year in the earth before they will vegetate. The pots in which these seeds are sown should be exposed to the open air at all times in mild weather, and screened from hard rain and frost. In the spring, the plants will appear. They must have fresh air in mild weather, and be refreshed with water in dry seasons. As soon as they are fit to remove, let each be planted in a small pot, filled with the same rich earth, and placed in the shade till they have taken new root; then they may be set so as to enjoy the morning sun till autumn. Water them during the dry weather in summer, and when their roots have filled the small pots, remove them into larger. In autumn, put them under a common frame to screen them from winter frost, taking care that they have fresh air in fine weather. Next spring, new pot them, placing them in the morning sun, and taking care to water them in dry weather, which will cause their stalks to be stronger and produce larger spikes of flowers in August. There are many who propagate them by cutting their stalks into proper lengths, which they plant in pots filled with good earth, or into an east border, covering them close with glasses. They frequently take root, but are not so good as seedlings.

25. Lobelia Siphilitica; *Blue Lobelia,* or *Cardinal Flower.* Stem upright; leaves ovate-lanceolate, subserrate; sinuses of the calix reflex; root perennial; stem from a foot to two feet in height; flowers axillary, solitary, numerous, large; corolla blue, varying in shades from a rich violet to a pale blue. It flowers from August to October, and is a native of Virginia.—Every part of the plant abounds with a milky juice, and has a rank smell. The root, which is the part prescribed for medical use, resembles tobacco in taste, and tends to excite vomiting. It derives its trivial name from its efficacy in the cure of siphilis, as experienced by the North American Indians, with whom it was a secret. Sir William Johnson purchased the secret; which has been published, and is as follows: A decoction is made of a handful of the roots in three measures of water. Of this, half a measure is taken in the morning fasting, and repeated in the evening: the dose is gradually increased till the purgative effects become too violent, when it is to be omitted for a day or two, and then renewed, till a perfect cure is effected. During the use of this medicine, a proper regimen is enjoined; and the ulcers also are to be frequently washed with the decoction, or, if deep and foul, to be sprinkled with the powder of the inner bark of the New Jersey Tea Tree, (see *Ceanothus Americanus.*) But although this plant is said to cure the disease in a very short time, its virtues have not been confirmed by any instances of European practice. For its propagation and culture, see the preceding species.

26. Lobelia Lactescens. Shrubby: leaves smooth, elliptic-lanceolate, serrate; peduncles axillary, solitary, without bractes; calices smooth.—Native of St. Helena.

27. Lobelia Surinamensis. Suffruticose: leaves oblong, serrate, smooth; peduncles axillary, solitary, bracted at the base; calices torulose. It flowers in April.—Native of the West Indies. See the seventeenth species.

28. Lobelia Inflata; *Bladder-podded Lobelia.* Stem upright; leaves ovate, subserrate, longer than the peduncle; capsules inflated; flowers small; corolla light blue.—Native of Virginia and Canada. Sow the seeds in autumn, in pots filled with rich earth, and treat the plants in the same way as above directed under the twenty-fourth species.

29. Lobelia Cliffortiana; *Purple Lobelia.* Stem upright; leaves cordate, even, obsoletely toothed, petioled; corymb terminating; flowers small, purplish.—Native of America. When the seeds are permitted to scatter on pots which stand near them, and these are sheltered from frosts, the plants will come up plentifully in the following spring: or if they be be sown in pots in autumn, and sheltered in winter, the plants will rise in the following spring; and should be transplanted into small pots, placed under a frame.

30. Lobelia Urens; *Stinging Lobelia.* Stem upright, smooth, angular; leaves lanceolate, toothed, smooth; racemes spike-shaped; calicine segments awl-shaped, even; corolla bright blue. The whole plant is milky, of a warm taste, and the root, especially if chewed, excites a pungent sense of burning in the tongue.—Native of France, Spain, and England: it has been found on Shute Common, between Axminster and Honiton, flowering in July and August. Sow the seeds in autumn, on a warm border, or in pots filled with loamy earth, and placed under a common frame in winter. When they come up in the spring, transplant them into a border of soft loamy earth, or into other pots, shading them till they have taken new root, and duly watering them in dry weather, which will cause them to flower strong, and produce good seeds annually.

31. Lobelia Minuta; *Least Lobelia.* Root-leaves ovate; scapes axillary.—Native of the Cape of Good Hope. See the thirty-eighth species.

32. Lobelia Volubilis; *Twining Lobelia.* Stem twining.—Native of the Cape of Good Hope. See the thirty-eighth species.

33. Lobelia Amœna. Plant erect, very smooth; leaves lato-lanceolate, serrate; spikes multiflorous; laciniæ of the calix very entire; flowers of a beautiful sky-blue. This grows to the height of from two to three feet, and is found on the mountains of Virginia and Carolina.

34. Lobelia Glandulosa. Plant erect; subracemose, subpubescent, lucid; leaves lanceolate, glandulous-serrate, subcarnous; flowers racemose, on short footstalks; laciniæ of the calix revolute, dentated; flowers dark blue.—It grows from eight inches to a foot high, and is found in Pine-swamps from Virginia to Florida.

35. Lobelia Puberula. Plant erect, very simple, pubescent; leaves oblong-oval, repand-serrulate; flowers spicated, alternate, subsessile; germen hispid; calix ciliate; flowers middle size, sky-blue.—It grows from one to two feet high, and is found in the range of mountains from Virginia to Carolina.

**** With a prostrate Stem, and gashed Leaves.*

36. Lobelia Laurentia; *Italian Annual Lobelia.* Stem prostrate; leaves lanceolate-oval, crenate; stem branched; peduncles solitary, one-flowered, very long.—Native of Italy about Pisa; also of the islands of Elba, Corsica, and Sicily.

37. Lobelia Repanda. Stem prostrate, quite simple; leaves roundish, repand toothed; peduncles axillary, solitary, one-flowered.—Native of New Zealand.

38. Lobelia Erinus; *Small Spreading Lobelia.* Stem patulous; leaves lanceolate, somewhat toothed; peduncles very long; flowers small and blue, appearing in July.—Native of the Cape of Good Hope. If the seeds of this and of the next species, together with the seeds of all those which are natives of the Cape of Good Hope, be sown in autumn, they will succeed much better than when they are sown in spring. They may be sown in pots, and placed under a common hot-bed frame in winter, always exposing them to the open air in mild weather, but screening them from the frost. In the spring, they should be plunged into a moderate hot-bed, which will soon bring up the plants; and when they are fit to remove, they should be each planted in a separate small pot, filled with rich earth, and replunged into a moderate hot-bed. Here they should be shaded from the sun till they have taken new root, and afterwards must have a large share of air in mild weather. Then they should be gradually hardened to bear the open air, into which they ought to be removed in June, placing them in a sheltered situation, where they will flower in July: and if the season should prove favourable, the seeds will ripen in September; but if the season should prove cold, it will be proper to remove one or two plants into a glass case, to obtain good seeds.

39. Lobelia Erinoides; *Trailing Lobelia.* Stems prostrate, filiform; leaves petioled, oblong, toothed.—Native of the Cape of Good Hope. See the preceding species.

40. Lobelia Anceps. Leaves lanceolate, decurrent; root annual.—Native of the East Indies.

41. Lobelia Pubescens; *Downy leaved Lobelia.* Stems angular, prostrate; leaves lanceolate, toothed, rough-haired; peduncles axillary, one-flowered. It flowers from May to August.—Native of the Cape of Good Hope. See the thirty-eighth species.

42. Lobelia Zeylanica. Stems procumbent; leaves ovate, serrate, acute, lower obtuse; peduncles one-flowered; capsules subvillose; flowers blue.—Native of China, in watery and shady places.

43. Lobelia Lutea; *Yellow Lobelia.* Stems procumbent; leaves lanceolate, serrate; flowers sessile, subspiked. It flowers in June and July.—Native of the Cape of Good Hope. See the thirty-eighth species.

44. Lobelia Hirsuta. Shrubby, hirsute, prostrate: leaves ovate, toothed; peduncles lateral, very long, two or three-flowered.—Native of the Cape of Good Hope. See the thirty-eighth species.

45. Lobelia Coronopifolia. Leaves lanceolate, toothed; peduncles very long.—Native of the Cape of Good Hope. See the thirty-eighth species.

***** With a prostrate Stem, and entire Leaves.*

46. Lobelia Depressa. Depressed: leaves lanceolate; stem fleshy; flowers dark purple.—Native of the Cape of Good Hope. See the thirty-eighth species.

Loblolly Bay. See *Gordonia.*

Locker-Goulans. See *Trollius.*

Locust Tree. See *Hymenæa.*

Loeflingia; a genus of the class Triandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth five-leaved, upright; leaflets lanceolate, marked on each side at the base with a toothlet, sharp-pointed, permanent. *Corolla:* petals five, very small, oblong-ovate, converging into a globe, round. *Stamina:* filamenta three, length of the corolla; antheræ roundish, twin. *Germen:* superior, ovate, three-cornered; style filiform, rather wider above; stigma a little obtuse. *Pericarp:* capsule ovate, somewhat three-cornered, one-celled, three-valved. *Seeds:* a great many, ovate, oblong. ESSENTIAL CHARACTER. *Calix:* five-leaved. *Corolla:* five-petalled, very small. *Capsule:* one-celled, three-valved.——The only known species is,

1. Loeflingia Hispanica. Root annual; branches prostrate, alternate; corolla white. It flowers in June.—Native of Spain, on open hills.

Loeselia; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, tubular, four-cleft, sharp, short, permanent. *Corolla:* one-petalled, unequal; tube the length of the calix; border five-parted; all the divisions deflected to the lower side, ovate-lanceolate, equal. *Stamina:* filamenta four, length of the corolla, of which two are shorter; all opposite the divisions of the petals, and reflected in a contrary situation to the corolla; antheræ simple. *Pistil:* germen ovate; style simple, situated as the stamina; stigma thickish. *Pericarp:* capsule ovate, three-celled. *Seeds:* solitary or two, obscurely cornered. *Observe.* Gærtner remarks, that the stamina are five, one of which is shorter than the rest, and fastened to the nearest segment of the corolla, the rest inserted into the tube. ESSENTIAL CHARACTER. *Calix:* four-cleft; according to Gærtner, five-toothed. *Corolla:* with all the segments directed one way; Gærtner says, deeply five-cleft, with oblong ciliated segments. *Stamina:* opposite to the petal; according to Gærtner, five, unequal. *Capsule:* three-celled; gaping at top, according to Gærtner.——The only known species is,

1. Loeselia Ciliata. Stem upright; leaves opposite.—Found at La Vera Cruz in South America.

Logwood. See *Hæmatoxylum.*

Lolium; a genus of the class Triandria, order Digynia.—GENERIC CHARACTER. *Calix:* receptacle common, elongated into a spike, pressing the flowers, distichally spiked to the angle of the culm; glume univalve, opposite the shaft, awl-shaped, permanent. *Corolla:* bivalve; valvule inferior narrow-lanceolate, convolute, sharp-pointed, the length of

the calix; valve superior, shorter, linear, more obtuse, concave upwards; nectary two-leaved; leaflets ovate, obtuse, gibbous at the base. *Stamina:* filamenta three, capillary, shorter than the corolla; antheræ oblong. *Pistil:* germen top-shaped; styles two, capillary, reflex; stigmas plumose. *Pericarp:* none. Corolla cherishes the seed, gapes, lets it fall. *Seed:* single, oblong, convex on one side, furrowed, flat on the other, compressed. *Observe.* The sessile spikes are placed in the same plane with the culm; hence the stem bears the office of a second calicine valve, deficient and opposite.——The species are,

1. Lolium Perenne; *Perennial Darnel,* or *Ray Grass.* Spikes awnless; spikelets compressed, longer than the calix, and composed of several flowers; root perennial, creeping; stems several from the same root. They are frequently russet-coloured at the joints. The spike is generally flat, but sometimes nearly cylindrical. The number of flowers in each spikelet varies from three or four, to six, seven, or eight, and even sometimes nine, ten, and eleven; but six or seven is the most common number.—This species was probably selected for cultivation because it is common, and the seeds are easily collected. In reply to the objections brought against this grass, Mr. Curtis judiciously remarks, that although it may not possess all that is desirable in a grass, it ought not therefore to be indiscriminately rejected. The complaint so generally urged against it, of its producing little more than stalks or bents, will be only found valid when the plant grows in upland pasture: in rich moist meadows its foliage is more abundant, and it seems to be the general opinion of Agriculturists, that it is highly nutritious and acceptable to cattle. Certainly it is not adapted to all soils and situations equally. Several sorts may even be preferable to it; and though early, it is not the first that springs; not only the Vernal, but the Fox-tail and Meadow Grasses, all excellent in their kind, appearing earlier than this. Ray Grass is, notwithstanding, valuable both as an early seed, and as being fit to mow for hay a fortnight before mixt grasses. For the latter use, the abundance of stalks is an excellence, provided the grass be cut whilst the sap is in them, the chief nutriment of hay residing in these. This grass is usually sown with clover, upon such lands as are designed to be ploughed again in a few years, and the common method is to sow it with Spring Corn; but from many repeated trials, it has always been found, that by sowing their seeds in August, when a few showers have fallen, the crop has answered much better than any sown in the common way; for the grass has often been so rank, as to afford a good feed the same autumn; and in the following spring there has been a ton and half of hay per acre mowed very early in the season, and this has been upon cold sour land: this proves it to be the best season for sowing these grasses, though it will be very difficult to persuade those persons to adopt this practice who have been long wedded to old customs. The necessary quantity of seed is about two bushels, and eight pounds of the common clover, to an acre. This will produce as good plants as can be desired; but is not to be practised upon lands where the beauty of the verdure is principally regarded, but only where profit is the main end in view. When this grass is fed, mow off the bents in the beginning of June, otherwise they will dry upon the ground, and have the appearance of a stubble field all the latter part of summer; and they will not only be disagreeable to the sight, but troublesome to the cattle, who will not touch them. By permitting them to stand, the after growth of the grass is greatly retarded, and the beautiful verdure lost for three or four months; so that it is good husbandry to mow the bents before they grow too dry, and rake them off the ground: if they are then made into hay, it will serve for cart-horses or dry cows in the winter. This plant is common in most parts of Europe, by way-sides, and in pastures, flowering in June. It is called *Ray Grass* from *Ivraie,* the name given to the third species by the French, who call this *Fausse Ivraie.* Ray calls it, *Red Darnel Grass;* it is sometimes called *Crap;* in Devonshire, *Eaver;* in Norfolk, *White Nonesuch.* The Germans give it many names, *Perennirende,* or *Dauernde Lolch, Winter Lolch, Susser Lolch, Englische Reygrass,* &c.; the Danes call it, *Raigræs;* the Swedes, *Renrepe, Engelmans Rijegras;* the Italians, *Loglio Vivace, Loglio Salvatico, Fenice;* the Spaniards, *Ballico, Vallico;* the Portuguese, *Joyo Vivace;* and the Russians, *Pschanez.*

2. Lolium Tenue. Spike awnless, round; spikelets three-flowered. This is smaller than the preceding, and is distinguished by the tenuity of the culm and spike.—Native of France and Germany.

3. Lolium Temulentum; *Annual Darnel,* or *Ray Grass.* Spike awned; spikelets compressed, many-flowered; root annual; stems or culms from two to three feet high, upright. There is a variety without awns, and with a smooth culm, which Withering makes a distinct species, under the name of *White Darnel.* Though there can be no doubt that the Perennial and Annual Darnel are distinct species, yet we are at a loss for specific distinctions; for the first has sometimes awns to the flowers, and the latter very often none. It is, however, besides being annual, taller and larger in every respect, and of a paler hue. Its place of growth is also different; for it is a weed among corn, especially wheat and barley; and also among flax: flowering in July and August. The flour of the seeds, mixed with wheat-flour, disorders the human body, producing vomiting, purging, and violent colics; but it has not a sensible effect unless taken in considerable quantity; or, as Linneus says, unless it be eaten hot. The seed, malted with barley, soon occasion drunkenness: hence the French name *Ivraie;* and, by corruption, our English *Ray.* In Yorkshire, it is called *Droke;* and in Ireland, *Sturdy.* The Germans call it *Jakrige Lolch,* and *Germaine Lolch,* with about thirty other names; the Danes, *Heyre* and *Heyregræs,* &c. the Swedes, *Darrepe;* the Italians, *Loglio, Gioglio,* and *Zizania;* the Spaniards, *Joyo, Cizana,* and *Zizana;* the Portuguese, *Joyo, Zizania Basturda,* and the Russians, *Kukol.* In this enlightened age, it can scarcely be necessary to correct an old vulgar error, that wheat degenerates into this grass. The fact is, that in very wet seasons, and among very bad husbandmen, the Darnel has so far prevailed, as to suffocate the wheat, and to take its place. Celsus recommends the meal of Lolium to be used in poultices, in common with that of wheat, for barley and lentil. Those who do not keep their wheat free from this Darnel, which is sown along with the seed of wheat, and may be separated from it by the sieve, are guilty of unpardonable negligence; as it is very injurious, and may be easily extirpated.

4. Lolium Bromoides; *Sea Darnel.* Panicle simple, pointing one way; spikelets awned; root annual; culms several, from six inches to a foot high. It flowers in June and July. —Native of England, in loose sand on the sea coast.

5. Lolium Distachyon. Spikes in pairs; calices one-flowered; corollas woolly; culms decumbent, branched at the base.—Native of Malabar.

Lonchitis; a genus of the class Cryptogamia, order Filices. —Generic Character. *Capsules:* disposed in lunulated lines, lying under the sinuses of the frond.—These Ferns, being natives of very hot climates, must be planted in pots, and plunged into the bark-pit: they may be increased by parting

the roots. In summer they should have plenty of free air, and be frequently watered.——The species are,

1. Lonchitis Hirsuta. Fronds pinnatifid, blunt, quite entire; shoots branched, hirsute, four feet high.—Native of South America and Jamaica.

2. Lonchitis Aurita. Fronds pinnate, the lowest pinnas two-parted; shoots undivided, prickly.—Native of South America.

3. Lonchitis Repens. Fronds pinnate; pinnas alternate, sinuate; shoots branched, prickly.—Native of South America.

4. Lonchitis Pedata. Frond pedate; pinnas pinnatifid, serrulate.—Native of Jamaica, in the mountains of New Liguance.

5. Lonchitis Tenuifolia. Arborescent: fronds decompounded; leaves pinnate; pinnas linear-oblong, serrate, the lower pinnatifid.—Native of the Isle of Tanna, in the South Seas.

London Pride. See *Saxifraga.*

Lonicera; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth five-parted, superior, small. *Corolla:* one-petalled, tubular; tube oblong, gibbous; border five-parted; divisions revolute, one of which is more deeply separated. *Stamina:* filamenta awl-shaped, nearly the length of the corolla; antheræ oblong. *Pistil:* germen roundish, inferior; style filiform, the length of the corolla; stigma obtuse-headed. *Pericarp:* berry umbilicated, two-celled. *Seeds:* roundish, compressed. *Observe.* The first species has the inferior division of the corolla separated twice as deep; berries distinct: the sixth has the divisions of the corolla cut almost equally deep; berries distinct: the eighth has the lower division of the corolla twice as deeply cut; two berries seated on the same base: the tenth has the divisions of the corolla almost equally cut; two berries on the same base: the twelfth and fourteenth are singular, in having one germen for two floscules, like *Mitchella:* the sixteenth has the corolla nearly bell-shaped; fruit two-celled, half four-celled; seeds solitary. ESSENTIAL CHARACTER. *Corolla:* one-petalled, irregular. *Berry:* many-seeded, two-celled, inferior: according to Gærtner, in the tenth, one-celled, and in the twelfth, three-celled.——The species are,

* *Periclymena, with a twining Stem.*

1. Lonicera Caprifolium; *Italian Honeysuckle.* Flowers ringent, in terminating whorls; leaves deciduous, the upper ones connate-perfoliate. This is a very smooth shrub, in its natural state twining round trees, with its long, round, opposite branches; flowers about six in a whorl, slender and delicate, white, reddish-white, red, or yellow, extremely fragrant. There are three varieties.—Native of the south of Europe. The Germans call it *Geisblatt;* the Dutch, *Italiansche Kamperfolie;* the Danes, *Italiænsk Gedeblad;* the Swedes, *Italienst Getblad;* the French, *Chevrefeuille des Jardins,* or *D'Italie;* the Italians, *Madreselva, Caprifoglio:* the Spaniards, *Madreselva;* the Portuguese, *Matrisylva.* A strong decoction of Honeysuckle-leaves is no despicable remedy in complaints arising from obstructions of the liver. It operates by urine, and is a good ingredient in gargles for sore throats. The distilled water of the flowers is much esteemed by many as an excellent cosmetic. All the sorts of Honeysuckle are propagated either by layers or cuttings: when by layers, the young plants only should be chosen. They should be layed in the autumn, and by the following autumn will have taken root; when they should be cut off from the plants, and either planted where they are to remain, or into a nursery, to be trained up for standards, which must be done by fixing down stakes to the stem of each plant, to which their principal stalk should be fastened, and all the others cut off; the principal stalk must be trained to the intended height of the stem, and should then be shortened, to force out lateral branches, which should be stopped, to prevent their growing too long; by constantly repeating this, as the shoots are produced, they may be formed into a sort of standard: but if any regard be had to their flowering, they cannot be formed into regular heads; for by constantly shortening their branches, the flower-buds will be cut off, so that few flowers can be expected: and as it is an unnatural form for these trees, but few of them should be so sacrificed; for when they are planted near other bushes, among the branches of which the shoots of the honeysuckles may run and mix, they will flower much better, and have a finer appearance than where more regularly trained. When the plants are in the nursery, if two or three of the principal shoots are trained up to the stakes, and the others are entirely cut off, they will be fit to transplant in the following autumn to the places where they are to remain; for though the roots may be transplanted of a greater age, yet they do not thrive so well as when they are removed while they are young. When these plants are propagated by cuttings, they should be planted in September, as soon as the ground is moistened by rain. Three of the four joints of the cuttings should be buried in the ground; from the fourth, remaining above the surface, the shoots will be produced. They may be planted in rows, at about a foot distance row from row, and four inches asunder in the rows, treading the earth close to them; and as the Evergreen and late Red Honeysuckles are a little more tender than the other sorts, if the ground between the rows where these are planted is covered with tanner's bark, or other mulch, to keep out the frost in winter, and the drying winds of the spring, it will be of great advantage to the cuttings: and if the cuttings have a small piece of the two years' wood at their bottom, there will be no hazard of their taking root. The plants which are raised from cuttings are preferable to those which are propagated by layers, as they have generally better roots. They may also be propagated by seeds; but unless they are sown in the autumn, soon after they are ripe, the plants will not come up the first year. They will grow in any soil or situation. Few shrubs deserve to be cultivated before those of this genus; for their flowers are very beautiful, and perfume the air to a great distance with their odour, especially in the mornings and evenings, and in cloudy weather, when the sun does not evaporate their odour, and raise it too high to be perceptible: so that in all retired walks there cannot be too many of them intermixed with other shrubs.

2. Lonicera Dioica; *Glaucous Honeysuckle.* Whorls subcapitate, bracted; leaves deciduous, glaucous beneath, the upper ones connate-perfoliate; corollas ringent, gibbous at the base.—Native of North America.

3. Lonicera Sempervirens; *Trumpet Honeysuckle.* Spikes naked, terminating; the upper leaves connate-perfoliate; corollas almost regular; tube bellying at top. There are two varieties, if not distinct species, of this; one much hardier than the other. It has been long known in our gardens by the name of Virginia Trumpet Honeysuckle. The flowers have no odour; but for the beauty of their flowers, and their long continuance together, with their leaves being evergreen, they are preserved in most curious gardens. This is usually planted against walls and pales, to which their branches are trained; for they are too weak and rambling to be reduced to heads, and are liable to be killed in severe winter. Hence it ought to have a warm aspect, where it will begin to flower at the end of June, and there will be a succession of flowers till autumn. It may be trained like the other honeysuckles, and will flower among other shrubs in the south border of a plan-

tation, in a warm soil, till injured or killed by an unusually severe winter. It is propagated by laying down the young branches, which will easily take root; and may be afterwards treated like the common honeysuckles. See the first species.

4. Lonicera Grata; *Evergreen Honeysuckle.* Flowers in terminating whorls; leaves perennial, obovate, glaucous beneath, the upper ones connate, superfoliate; corollas ringent; colour of the flowers red outside, and yellow within, of a strong aromatic flavour.—Native of North America. This will not thrive where it is too much exposed to the cold in winter, but flourishes best in a soft sandy loam, and will retain its leaves in greater verdure in such ground than in a dry gravelly soil, where, in warm dry seasons, the leaves often shrink, and hang in a very disagreeable manner; nor will those sorts which naturally flower late in the autumn continue so long in beauty on a dry ground, unless the season should prove moist and cold, as those placed in a gentle loam.

5. Lonicera Implexa; *Minorca Honeysuckle.* Fowers ringent in whorls; bractes even; leaves perennial, smooth, oblong, the upper ones connate-perfoliate, the uppermost dilated.—Native of Minorca.

6. Lonicera Periclymenum; *Common Honeysuckle.* Flowers ringent, in terminating heads; leaves deciduous, all distinct. This species trails over bushes, and twines round the boughs of trees, with its very slender hairy or smooth branches; the corollas are usually red on the outside, and yellowish within, but they vary much in colour, between red, purple, and yellow, and are very pale in the shade. They are exceedingly sweet, especially in the evening. In climbing, it turns from east to west, with most of our other English climbers; and, in common with them, it bears clipping and pruning well. When placed near buildings, it is liable to be disfigured and injured by aphides, vulgarly called blights. These insects are not very numerous in spring; but as the summer advances, they increase in a surprising degree: their first attacks therefore should be watched, and the branches they first appear on cut off and destroyed; for when they have once gained ground, they are defended by their numbers. Small plants may be cleared from them by tobacco dust, or Spanish snuff; but this is not practicable for large trees. The leaves are likewise liable to be curled up, by a small caterpillar, which produces a beautiful little moth, *Phalæna Tortrix.* In the evening, some species of Sphinges or Hawk-moths, are frequently observed to hover over the blossoms, and with their long tongues to extract the honey from the very bottom of the flowers. A considerable quantity of nectareous juice may sometimes be discerned in the tube. Insects that are too large to penetrate into the narrow part of the tube, and have not a long tongue, like the Sphinges, to reach the juice, let it out by making a puncture towards the bottom, and so fairly tap the liquor.—There are several varieties: that called the Late Red Honeysuckle produces a greater quantity of flowers together than either the Italian or Dutch Honeysuckle; so that it makes a finer appearance than any of them during the time of flowering. There is also a variety with variegated leaves. The English call this plant Woodbine, Suckling, and Caprifoly, as well as Honeysuckle; the Germans, among a host of other names, call it *Specklilie, Geislilie;* the Dutch, *Gewoone Kamperfolie;* the Danes, *Gedeblad;* the Swedes, *Matlesfrad;* the French, *Le Chevrefeuille des bois;* the Italians, *Caprifoglio* and *Vincibosco;* the Spaniards, *Madreselva, Virginia,* and *Periclimeno;* and the Portuguese, *Matrisylva do Norte.* For its medical uses, and method of propagation and culture, see the first species.

7. Lonicera Japonica; *Japonese Honeysuckle.* Flowers terminating in pairs, sessile; all the leaves distinct; stem twining.—Native of Japan.

** Chamæcerasa—*with two-flowered Peduncles.*

8. Lonicera Nigra; *Black-berried Upright Honey suckle* Peduncles two-flowered; berries distinct; leaves elliptic, quite entire; height three or four feet; corolla purple on the outside, white within, or quite white, pubescent. It flowers in March, April, and May.—Native of France, Switzerland, Austria, Silesia, and Piedmont.

9. Lonicera Tartarica; *Tartarian Upright Honeysuckle.* Peduncles two-flowered; berries distinct; leaves cordate, obtuse. This is a tree, often six feet high, rising with several trunks, frequently thicker than the wrist, spreading, branched very much from the bottom; corollas before they open parallel, club-shaped, of a deep rose-colour, when open flesh-coloured. In shady groves it varies with a white flower, and in autumn the leaves put off their fringes and become quite smooth.—Native of Russia, but not beyond lat. 55. N. It flowers in April, and the fruit is ripe in July. It is infested by the insect called *Meloe Vesicatoria,* and the insect is collected from this shrub for the apothecaries. The berries of this plant are eaten by the common people of Russia, though they are nauseously bitter, and purgative. The flowers have hardly any smell. The wood is very hard and solid, of a yellowish gray colour, beautifully veined, and used to make walking sticks, and the handles of tools.

10. Lonicera Xylosteum; *Fly Honeysuckle.* Peduncles two-flowered; berries distinct; leaves quite entire, pubescent. It rises with a strong woody stalk, six or eight feet high, covered with a whitish bark, dividing into many branches. The flowers come out on each side of the branches opposite, on slender peduncles, each sustaining two white flowers standing erect. Linneus says, that this shrub makes excellent hedges in a dry soil; that the parts between the joints of the shoots are used in Sweden for Tobacco pipes; and that the wood, being extremely hard, makes teeth for rakes. Gmelin says, that the Russians prepare an empyreumatic oil per descensum from the wood, which they recommend for cold tumors and chronical pains. Animals seldom touch the leaves. Birds eat the berries only in hard weather; they are reputed to be purgative and emetic.—It is common in the more northern parts of Russia, and in Siberia as far as the river Jenisea, and even in Hungary, the south of France, and Italy: Dr. Withering says it is a native of England. See the first species.

11. Lonicera Pyrenaica; *Pyrenean Upright Honeysuckle.* Peduncles two-flowered; berries distinct; leaves oblong, smooth.—Native of the Pyrenees, and of Siberia.

12. Lonicera Alpigena; *Red-berried Upright Honeysuckle.* Peduncles two-flowered; berries coadunate-twin; leaves oval-lanceolate. This has a short, thick, woody stem, which divides into many strong woody branches, growing erect; flowers red on the outside, pale within.—Native of the south of Europe. See the first species.

13. Lonicera Caucasica. Peduncles two-flowered; berries coadunate-twin; leaves ovate-lanceolate, quite entire; height five feet; trunk covered with a whitish bark; branches spreading, red or hoary, testaceous; corolla irregular, red. The wood is hard, weighty, like ivory, beautifully veined with green, much esteemed for walking-sticks, which are sent to Petersburg. The Russians call it *Togustun,* and the Tartars *Tokus-tuun,* which signifies nine-skins, because this shrub every year casts its epidermis, which adheres copiously to the twigs.—Native of Caucasus.

14. Lonicera Cœrulea; *Blue-berried Upright Honey-suckle.* Peduncles two-flowered; berries coadunate-globular; styles

undivided. It seldom rises more than four or five feet high; flowers white; wood hard, beautifully veined with gray and pale yellow. Berries large, dark blue, with a purple juice, which stains paper of a strong colour, and perhaps might be useful in dying.—Native of Switzerland, Austria, &c.

**** Stem upright, peduncles many-flowered.*

15. Lonicera Mongolica; *Russian Honeysuckle.* Peduncles many-flowered; berries simple, one-flowered; leaves ovate, serrate, pubescent; stem upright; corolla yellowish white.—Grows in the desert of the Mongols, and in Dauria.

16. Lonicera Symphoricarpos; *Shrubby St. Peter'swort.* Heads lateral, peduncled; leaves petioled. Height about four feet, sending out many slender branches; flowers of an herbaceous colour, in whorls. They appear in August and September.—Native of Virginia and Carolina.

17. Lonicera Bubalina. Heads terminating, peduncled; leaves oblong, quite entire, smooth; branches round, smooth.—Found by Sparrmann at the Cape of Good Hope, where the Dutch call it *Buffelharn.*

18. Lonicera Diervilla; *Yellow-flowered Upright Honeysuckle.* Racemes terminating; leaves serrate. This is a low shrub, seldom rising more than three feet high; flowers small, pale yellow.—Native of North America.

19. Lonicera Corymbosa. Corymbs terminating; leaves ovate-acute.—Native of Peru.

Looking Glass, Venus's. See *Campanula.*

Loosestrife. See *Anagallis* and *Lysimachia.*

Loosestrife, Codded. See *Epilobium Hirsutum.*

Loosestrife, Spiked. See *Lythrum.*

Lopezia; a genus of the class Monandria, order Monogynia. Essential Character. *Calix:* superior, of four unequal leaves. *Corolla:* irregular, of four petals. *Nectary:* stalked, folded, opposite to the stamen. *Capsule:* of four cells and four valves. *Seeds:* numerous.——The species are,

1. Lopezia Hirsuta; *Hairy Lopezia.* Leaves ovate, downy; stem round, hairy. The plant is annual, kept in the stove, and flowers from September to November. The stem is two feet high, branched, pale green, clothed with longish soft hairs; leaves alternate, stalked, about an inch long; clusters solitary, at the end of every little branch, somewhat corymbose, leafy; flowers spreading, prettily variegated with pink, deep red, and white, in shape not unlike some sort of little flies: when touched, they exhibit a striking elasticity, if not irritability.—Native of Mexico.

2. Lopezia Racemosa; *Smooth Lopezia.* Stem square, smooth, as well as the leaves; floral leaves minute. This much resembles the first species, but differs in the squareness of the stem.—Native of Mexico.

3. Lopezia Coronata; *Coronet-flowered Lopezia.* Leaves smooth and shining; stem angular, from the decurrent footstalks; floral leaves mostly longer than the flower-stalks.—Native of Mexico.

Lopping. It is very observable that most old trees are hollow within; which does not proceed from the nature of the trees, but is the fault of those who suffer the tops to grow large before they lop them, as the Ash, Elm, and Hornbeam, and persuade themselves that they may have the more great wood; but in the mean time do not consider that the cutting off great tops or branches endangers the life of a tree, or at least wounds it so that the trees which are thereby yearly decayed in their bodies, amount to much more than the quantity of tops produced; hence it is to the loss of the owner to have them so managed. But the lopping of young trees at ten or twelve years old, in general will preserve them much longer, and will occasion the shoots to grow more into wood in one year, than they do in old tops in two or three. As large boughs, clumsily taken off, often spoil the trees, they should always be spared, except in a case of absolute necessity; but when they must be cut off, it should be close and smooth, and not in a slanting manner, and the wound ought to be covered with loam and horse-dung mixed, to prevent the wet from entering the body of the tree. When trees are at their full growth, there are several signs of their decay; as, the withering or dying of many of their top branches; or if the wet enters at any knot; or they are anywise hollow or discoloured; if they make weakly shoots; and when the woodpeckers drill holes in them. This lopping of trees is only to be understood for pollard trees; because nothing is more injurious to the growth of timber-trees, than that of lopping or cutting off great branches from them: whoever will be at the trouble of trying the experiment upon two trees of equal size and age, growing near each other, to lop off the side branches from one of them, and suffer all the branches to grow upon the other, will in a few years find the latter to exceed the other in growth in every way, and that it will not decay so soon. All sorts of resinous trees, or such as abound with a milky juice, should be lopped very sparingly, for they are subject to decay when often cut. The best season for lopping these trees, is soon after Bartholomew tide, at which time they seldom bleed much, and the wound is commonly healed over before the cold weather comes on. But very few sorts of ornamental trees should be lopped, as it greatly injures their beauty and appearance: the only thing necessary is to take off such straggling branches as may grow out in an awkward direction, and render them less ornamental.

Loranthus; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* perianth of the fruit inferior; margin entire, concave;—of the flower superior, or the margin entire, concave. *Corolla:* petals six, oblong, revolute, equal. *Stamina:* filamenta six, awl-shaped, fastened to the bases of the petals, the length of the corolla; antheræ oblong. *Pistil:* germen oblong, between the two calices, or inferior; style simple, the length of the stamina; stigma blunt. *Pericarp:* berry oblong, one-celled. *Seed:* oblong. Essential Character. *Germen:* inferior; calix none. *Corolla:* six-cleft, revolute. *Stamina:* at the tips of the petals. *Berry:* one-seeded.—These are mostly parasitical shrubs, the leaves thickish, often opposite, but sometimes alternate; flowers axillary, sometimes, but seldom, terminating, corymbed or spiked, or on one-flowered pedicels. —The species are,

1. Loranthus Tetrapetalus. Peduncles one-flowered, subsolitary; leaves ovate, obtuse, subsessile.—Native of New Zealand.

2. Loranthus Scurrula. Peduncles one-flowered, heaped; leaves obovate.—Native of China and the Philippine Islands.

3. Loranthus Uniflorus. Racemes quite simple.—Native of St. Domingo, in woods, flowering in November and December.

4. Loranthus Glaucus. Peduncles axillary, one-flowered; leaves ovate, glaucous.—Native of the Cape.

5. Loranthus Europæus. Racemes simple, terminating; flowers diœcous.—Native of Austria, parasitical on oaks; and also of Siberia.

6. Loranthus Americanus. Racemes somewhat branched, cymed; flowers nodding; leaves ovate, differm.—This species ramps over the highest trees in Jamaica, Martinico, &c. It especially climbs the Coccoloba Grandifolia, with the root adhering firmly to the bark like Misselto. If a large bough, on which it grows, be cut off, the next day it withers and perishes.

7. Loranthus Emarginatus. Racemes axillary, simple; leaves wedge-shaped, ovate, emarginate.—Native of Hispaniola.

8. Loranthus Occidentalis. Racemes simple; flowers irregular. They appear in April and May. It is found upon trees.—Native of South America and the West Indies.

9. Loranthus Loniceroides. Flowers aggregate-capitate.—Native of the East Indies.

10. Loranthus Stelis. Racemes trichotomous; peduncles three-cornered; flowers equal.—Native of South America, and the Society Isles.

11. Loranthus Parvifolius. Peduncles axillary, trifid; pedicels one-flowered; leaves ovate, entire. 12. Loranthus Pauciflorus. Peduncles trichotomous, shorter than the leaves; leaves obovate.—Both natives of Jamaica.

13. Loranthus Pentandrus. Racemes simple; flowers five-cleft; leaves alternate, petioled.—Native of the East Indies.

14. Loranthus Falcatus. Racemes few-flowered, axillary; leaves linear, blunt, laterally sickled, glaucous.—Found upon trees near Madras.

15. Loranthus Spicatus. Spikes quadrangular; flowers small, inodorous, red; leaves quite entire, blunt, smooth. This branching shrubby plant grows upon other shrubs. It flowers in April and May.—Native of Carthagena.

16. Loranthus 'Cochinensis. Peduncles many-flowered, heaped; leaves acute; stem woody, twisted, short, very much branched.—It grows upon the branches of trees in the gardens of Cochin-china.

17. Loranthus Pedunculatus. Racemes simple, solitary; flowers in threes, peduncled.—Native of Carthagena, in woods, especially in salt-marshes.

18. Loranthus Sessilis. Racemes simple, solitary; flowers in threes, sessile.—Native of the woods in Carthagena.

Lotus; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* umbel simple; perianth one-leafed, tubular, half five-cleft; teeth acute, equal, erect, permanent. *Corolla:* papilionaceous; banner roundish, bent down; claw oblong, concave; wings roundish, shorter than the banner, broad, converging upwards; keel gibbous below, closed above, acuminate, ascending, short. *Stamina:* filamenta diadelphous, simple, and nine-cleft, ascending, with broadish tips; antheræ small, simple. *Pistil:* germen columnar, oblong; style simple, ascending; stigma an inflected point. *Pericarp:* legume cylindric, stiff and straight, stuffed, longer than the calix, many-celled, two-valved. *Seeds:* several, cylindric. Essential Character. *Calix:* tubular. *Wings:* converging longitudinally upwards. *Legume:* cylindric.——The species are,

* *With few Legumes, not forming a head.*

1. Lotus Maritimus; *Sea Bird's-foot Trefoil.* Legumes solitary, membranaceous, quadrangular; leaves smooth; bractes lanceolate. Root perennial; stems several, decumbent, slender, half a foot long; corolla large, yellow.—Native of many parts of Europe on the sea-coast, as Sweden, Denmark, the south of France, the county of Nice, &c. flowering in October. This, which those species that are referred to it, may be propagated by seeds, which should be sown early in April, upon an open bed or border exposed to the sun, where the plants are to remain: when they come up, they must be thinned, leaving them nearly two feet asunder, and afterwards weeding will be all the culture they require.

2. Lotus Siliquosus; *Square-podded Bird's-foot Trefoil.* Legumes solitary, membranaceous-quadrangular; stems procumbent; leaves pubescent underneath. Flower solitary, terminating, large, pale yellow.—Native of moist meadows in the south of Europe. See the preceding species.

3. Lotus Tetragonolobos; *Winged Bird's-foot Trefoil.* Legumes solitary, membranaceous-quadrangular; bractes ovate. Root annual; stems several, upright, about a foot long, having at each joint a ternate leaf. It flowers in June and July, and the seed ripens in autumn. It was formerly cultivated as an esculent plant, for the green pods, which are still said to be eaten in some of our northern counties, but they are very coarse.—Native of Sicily. This plant is now chiefly cultivated in flower-gardens for ornament. The seeds are sown in patches, five or six together, where they are designed to remain: if they all grow, some of the plants may be pulled up, leaving only two or three in a patch, and afterwards they will require no other care but to keep them clean from weeds.

4. Lotus Conjugatus; *Twin-podded Bird's-foot Trefoil.* Legumes conjugate, membranaceous-quadrangular; bractes oblong ovate. Stems branching, a foot long. It differs from the preceding in having corollas only half as large.—Native of the south of France. See the first species.

5. Lotus Tetraphyllus; *Four-leaved Bird's-foot Trefoil.* Legumes solitary; leaves ternate, obcordate, wedge-shaped; stipule solitary, similar; bractes one-leafed. Stems filiform; corolla yellow, with the back of the banner dark purple.—Native of Majorca.

6. Lotus Edulis; *Esculent Bird's-foot Trefoil.* Legumes solitary, gibbous, curved in. An annual, with several trailing stalks. The Candians eat the pods when young.—Native of Italy and Candia. It flowers with us in July, but seldom ripens seed. See the first species.

7. Lotus Peregrinus; *Flat-podded Bird's-foot Trefoil.* Legumes subbinate, linear, compressed, nodding.—Native of the south of Europe. See the first species.

8. Lotus Angustissimus; *Narrow-podded Bird's-foot Trefoil.* Legumes subbinate, linear, stiff, upright; stem upright; peduncles alternate. Root weak, branched; stems straight, numerous, a foot high. Native of the south of France.

9. Lotus Glaucus; *Glaucous Bird's-foot Trefoil.* Legumes subbinate, cylindrical, smooth; leaflets somewhat wedge-shaped, fleshy, hoary; stipules leaf-form. Biennial, flowering from June to August.—Native of Madeira.

10. Lotus Arabicus; *Red-flowered Bird's-foot Trefoil.* Legumes cylindrical, awned; stems prostrate; peduncles three-flowered; bractes one-leafed. Root perennial; stems several.—Native of Arabia.

11. Lotus Ornithopodioides; *Claw-podded Bird's-foot Trefoil.* Legumes subternate, bowed, compressed; stems diffused. Peduncles axillary, two or three inches long, terminated by a cluster of yellow flowers, which sleep during the night with the bractes covering them.—Native of Sicily, Provence, and Siberia. See the first species.

12. Lotus Jacobæus; *Dark-flowered Bird's-foot Trefoil.* Legumes subternate; stem herbaceous, upright; leaflets linear. Flowers three to five together, of a very rich brown purple.—Native of the Cape de Verd Islands. It is too tender to live abroad; the plants therefore are kept in pots, which in winter are placed in a warm airy glass-case, or dry stove, but in summer are placed abroad in a sheltered situation. It may be easily propagated by cuttings during the summer season, and also by seeds; but the plants which have been two or three times increased by cuttings are seldom fruitful. They are subject to dying off all at once, and therefore new ones should be constantly raised, especially as this is a very beautiful sort, and almost always in flower.

13. Lotus Creticus; *Silvery Bird's-foot Trefoil.* Legumes subternate; stem suffrutescent; leaves silky, shining.—Native of Spain and the Levant. This will not endure the open air

of our climate, and must be treated in the same way as the preceding species. It may be increased by seeds, sown on a bed of light earth in April.

14. Lotus Dioscorides. Stem upright, branched; peduncles subbiflorous; legumes columnar, ovate torose. Root annual; stems a palm and half in height, round; flowers yellow, small. Native of the county of Nice.

15. Lotus Arboreus; *Tree Bird's-foot Trefoil.* Legumes quinate; leaflets obcordate; stem arboreous.—Native of New Zealand.

** *With many-flowered Peduncles, forming a head.*

16. Lotus Hirsutus; *Hairy Bird's-foot Trefoil.* Heads roundish; stem upright, rough-haired; legumes ovate. Stalk perennial, three feet high; corollas dirty white, with a few marks of pale red. It flowers from June to August.—Native of the south of France, Italy, Sicily, and of the Levant. It is propagated by seeds in the same way as the 12th species: the plants will live through the winter in the open air in moderate winters, but it will be proper to keep one or two plants in pots, to be sheltered in winter, lest those abroad should be destroyed by severe frost.

17. Lotus Græcus; *Five-leaved Bird's-foot Trefoil.* Heads roundish; stem upright, round-haired; leaves quinate; legumes ovate. Annual; flowers white.—Native of the Levant.

18. Lotus Rectus; *Upright Bird's-foot Trefoil.* Heads subglobular; stem upright, even; legumes straight, smooth. Root strong, perennial; corolla pale flesh-colour.—Native of the south of Europe. It may be cultivated for cattle, in the same manner as Lucerne. It rises easily from seeds, is very hardy, and will thrive on any light poor ground.

19. Lotus Corniculata; *Common Bird's-foot Trefoil.* Stems prostrate; heads of flowers flat; legumes cylindric, spreading. Root perennial, tapering, striking deeply into the earth; corolla, before it opens, of a bloody red on the outside, and of a yellowish green within; when expanded, of a full yellow; leaves ternate, petioled, one at each joint. This is cultivated in Hertfordshire as a pasturage for sheep. It makes extremely good hay; and in moist meadows grows to a greater height than the Trefoils, and, in quality, seems to equal, if not surpass, most of them. In common with several other leguminous plants, it gives substance to the hay, and perhaps contributes to render it more palatable and wholesome for cattle.—It is found in most parts of Europe, in meadows, pastures, heaths, by road sides, in hedges, among bushes, and in woods; flowering from June to August. Withering calls it *Bird's-foot Claver;* in Yorkshire they term it *Cheesecake Grass;* and in some other counties, *Butterjags*, and *Crow-toes.* Mr. Curtis observes, that, whether this plant be deserving of the encomium bestowed upon it by different authors, the practical farmer must determine. There appears no reason why seed might not be obtained from it; and it should seem that land, not strong enough to bear Clover, might be improved by its introduction.

20. Lotus Cytisoides; *Downy Bird's-foot Trefoil.* Heads halved; stem diffused, very much branched; leaves tomentose. This is a perennial plant, sending out many stalks from the root.—Native of the south of Europe, on the sea-coast. See the first species.

21. Lotus Dorycnium; *Shrubby Bird's-foot Trefoil.* Heads leafless; leaves sessile, quinate. Stalks weak, shrubby, three or four feet high; flowers in heads, at the extremity of the branches, very small, and white, appearing in June, July, and September.—Native of the south of Europe. This will live in the open air, if it be planted in a dry soil, and warm situation. It is propagated by seeds, which will come up in a common border.

22. Lotus Medicaginoides. Legumes umbelled, bowed; leaflets obcordate, toothletted. Root annual; stem prostrate, grooved, rough-haired; peduncles axillary, with five or six small yellow flowers.—Native of Siberia.

23. Lotus Oligoceratos. Legumes binate, round, straight, striated, villose, dotted with white. Root annual; stems from ascending upright, branched, villose, half a foot or more in height; corolla yellow, not longer than the calix. It flowers at the beginning of July.—Native of Italy.

*** *Peduncles axillary, uniflorous.*

24. Lotus Sericeus. Leaves subsessile, oblong, acute sericeo-villose; peduncles axillary, uniflorous, longer than the leaf; flower unibracteate, yellow; laciniæ of the calix linear; legume glabrous, very long.—Found on the banks of the Missouri.

Lovage. See *Ligusticum.*

Love-Apple. See *Solanum Lycopersicum.*

Love-lies-a-bleeding. See *Amaranthus Caudatus.*

Louichea; a genus of the class Monadelphia, order Tetrandria. Essential Character. *Receptacle:* common peduncle-shaped, trichotomous, producing the flowers. *Pericarp:* proper four-parted; segments concave, subulate-acuminate, irregular, growing together. *Corolla:* none. *Filamenta:* four, connate, inserted into the receptacle. *Germen:* superior. *Style:* bifid. *Seed:* single, arilled, within the calix.——The only known species is,

1. Louichea Cervina. This is an annual very branching plant, a span high; stem almost upright, round; branches in whorls, the upper ones opposite; leaves six, in whorls, the two outer opposite; flowers terminating, coming out successively, sessile, close; the middle one solitary, herbaceous, two or three lines broad. See *Camphorosma.*

Lousewort. See *Pedicularis.*

Lucerne. See *Medicago.*

Ludwigia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four-parted, superior, permanent, segments lanceolate, spreading very much, length of the corolla. *Corolla:* petals four, obcordate, flat, spreading very much, equal. *Stamina:* filamenta four, awl-shaped, upright, short; antheræ simple, oblong, upright. *Pistil:* germen four-cornered, covered with the base of the calix, inferior; style cylindrical, length of the stamina; stigma obsoletely four-cornered, capitate. *Pericarp:* capsule four-cornered, blunt, covered and crowned by the calix, four-celled, four-valved; partitions opposite to the valves. *Seeds:* numerous, small; receptacle columnar, membranaceous, four-winged; wings in the angles of the partitions, seed-bearing on each side. Essential Character. *Calix:* four-parted, superior. *Corolla:* four-petalled. *Capsule:* inferior, four-cornered, four-celled. *Receptacle:* distinct from the axis of the fruit, bearing the seeds on each side.—These plants must be raised from seed in a hot-bed, in the spring, and treated as directed for *Amaranthus.* If not brought forward in the spring, they seldom produce good seeds in England.——The species are,

1. Ludwigia Alternifolia; *Alternate-leaved Ludwigia.* Leaves alternate, lanceolate; stem upright, annual; flowers small; corolla yellow. It flowers in June and July.—Native of Virginia and South Carolina.

2. Ludwigia Oppositifolia; *Opposite-leaved Ludwigia.* Leaves opposite, lanceolate; stem diffused, procumbent, a span long; flowers solitary, axillary; corolla yellow.—Native of the East Indies.

3. Ludwigia Repens; *Creeping Ludwigia.* Leaves opposite, ovate; peduncles solitary, axillary; stem creeping. Annual.—Native of Jamaica.

4. Ludwigia Erigata; *Upright Ludwigia.* Leaves opposite, lanceolate; stem upright; corolla scarcely visible. Annual.—Native of the East Indies.

5. Ludwigia Pedunculosa. Plant creeping, pubescent; leaves opposite, linear-lanceolate, glabrous; peduncles axillary, uniflorous, very long; capsules clavate-oblong, crowned; laciniæ of the calix lanceolate; flowers large, yellow.—It grows in swamps near the sea-coast, from Virginia to South Carolina.

6. Ludwigia Glandulosa. Leaves alternate, spathulate-oboval; plant procumbent, very smooth; flowers sessile, axillary, solitary; capsules very small, crowned; laciniæ of the calix round, acuminate.—Grows in the swamps of Lower Carolina.

7. Ludwigia Mollis. Plant erect, branchy, pubescent; leaves alternate, lanceolate-oblong; flowers sessile, alternate, superior, heaped together; capsules subrotund.—Grows in the swamps of Lower Carolina.

8. Ludwigia Virgata. Plant erect, virgated, glabrous; leaves alternate, linear, obtuse; flowers terminal, subspicate, pedicellate small; capsules globose tetragonal.—It grows in the dry sandy woods of Lower Carolina.

9. Ludwigia Decurrens. Plant erect, very branchy, glabrous; leaves alternate, linear-lanceolate, decurrent; flowers axillary, subsessile, solitary, alternate; capsules clavated, crowned; laciniæ of the calix oval-lanceolate. This plant rises to the height of about a foot, and bears large yellow flowers.—It grows in shady woods, near ponds and ditches, in Virginia and Lower Carolina.

10. Ludwigia Capitata. Plant erect, glabrous; leaves alternate, lato-linear, acute, rounded at the base; petals shorter than the calix; capsules subglobose, crowned; laciniæ of the calix dilatated, short; the infertile branches with short obovate leaves; flowers small, yellow.—It grows in the swamps of North and South Carolina.

11. Ludwigia Macrocarpa. Plant erect, ramose, slightly glabrous; leaves alternate, lanceolate, hoary on the underside; peduncles uniflorous, axillary; capsules globose-tetragonal; laciniæ of the calix great, coloured, crowned; flowers yellow; stem purple.—It grows in wet pastures and swamps, from New England to Florida.

12. Ludwigia Hirsuta. Plant erect, ramose, rough; leaves alternate, oblong, sessile, rough on both sides; peduncles uniflorous, axillary; capsules globose-tetragonal, crowned, bibracteated at the base.—It grows in ditches and ponds, on a sandy soil, from New Jersey to Carolina.

13. Ludwigia Linearis. Plant erect, virgated, glabrous, very branchy; leaves alternate, linear, acute; flowers axillary, solitary, sessile; capsules oblong, turbinate; laciniæ of the calix semi-lanceolate; flowers small, yellowish brown.—It grows from two to five feet high, and is found near ditches and ponds, in sandy soils, from Virginia to Carolina.

Lunaria; a genus of the class Tetradynamia, order Siliculosa.—Generic Character. *Calix:* perianth four-leaved, oblong; leaflets ovate-oblong, blunt, converging, deciduous, of which the two alternate ones are gibbous, and bagged at the base. *Corolla:* four-petalled, cruciform; petals entire, blunt, large, the length of the calix, ending in claws of the same length. *Stamina:* filamenta six, awl-shaped, four the length of the calix, two a little shorter; antheræ from upright spreading. *Pistil:* germen pedicelled, ovate-oblong; style short; stigma blunt, entire. *Pericarp:* silicle elliptic, flat, entire, upright, very large, pedicelled, terminated by the style, two-celled, two-valved; partition parallel, and equal to the valves, flat. *Seeds:* some, kidney-shaped, compressed, marginal, in the middle of the silicle; receptacles filiform, long, inserted into the lateral sutures. Essential Character. *Silicle:* entire, elliptic, compressed-flat, pedicelled; valves equal, and parallel to the partition, flat. *Calix:* with bagged leaflets.——The species are,

1. Lunaria Rediviva; *Perennial Honesty.* Silicles lanceolate; root perennial. This is a very large plant; stem three to four feet high; petals purple, odorous.—Native of the south of France, Italy, Austria, Hungary, &c. This and the next species are propagated by seeds sown in the autumn: those sown in the spring often miscarry, or lie a long time in the ground. They will grow in almost any soil, but love a shady situation; and require only to be kept clean from weeds: if the seeds be permitted to scatter, the plants will rise without further care; and if they be left unremoved, they will grow much larger than those which are transplanted.

2. Lunaria Annua; *Common Honesty,* or *Moonwort.* Silicles roundish; root biennial.—Native of Germany. See the preceding species. This plant has acquired the name of *White Satin:* it used to be dried and preserved to place in chimneys. The name *Honesty* seems to have been given to these plants, from the transparency of the seed-vessels; in which the whole may be seen without any optical deception. The Germans call it *Silberblume;* the Dutch, *Zilverbloem;* the Danes, *Maaneviol;* the Swedes, *Manefioler;* the French, *Satin-blanc;* and the Italians, *Lunaria.*

3. Lunaria Ægyptiaca; *Egyptian Honesty.* Silicles oblong, pendulous; leaves superdecompound, with trifid leaflets. Annual, with a smooth branching stalk little more than a foot high. It flowers here in June and July.—Native of Egypt. Sow the seeds in an open border, where they are to remain: if they be sown soon after they are ripe, the plants will come up in the autumn, and live through the winter in a sheltered situation. These will flower early the following summer; whereby ripe seeds may be obtained: they may also be sown in the spring. Keep them clean, and thin them where they are too close. If the seeds be permitted to scatter, they will rise without care.

Lungwort. See *Pulmonaria.*

Lungwort, Cow's. See *Verbascum.*

Lupine. See *Lupinus* and *Trifolium.*

Lupinus; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, bifid. *Corolla:* papilionaceous; banner cordate-roundish, emarginate, bent back at the sides, compressed; wings subovate, almost the length of the banner, not fastened to the keel, converging below: keel two-parted at the base, sickle-shaped upwards, acuminate, entire, the length of the wings, narrower. *Stamina:* filamenta ten, united, somewhat ascending, distinct above; antheræ five, roundish, and as many oblong. *Pistil:* germen awl-shaped, compressed, villose; style awl-shaped, ascending; stigma terminating, blunt. *Pericarp:* legume large, oblong, coriaceous, compressed, acuminate, one-celled. *Seeds;* several, roundish, compressed. Essential Character. *Calix:* two-lipped. *Antheræ:* five oblong, five roundish. *Legume:* coriaceous.—These plants are cultivated for ornament in the borders of the flower-garden, where they are sown in patches with other annuals in the spring, where they are to remain, thinning them where too close, and keeping them clean from weeds. To have a succession of flowers, the seeds may be sown at different times, as in April, May, and June; but the seeds of those sown in April only will ripen. They all make a pretty appearance when in flower.——The species are,

1. Lupinus Perennis; *Perennial Lupine.* Calices alternate, without appendicles; upper lip emarginate, lower entire. Root perennial, creeping; stalks erect, channelled, a foot and

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half high, sending out two or three small side branches, with digitale leaves, of from five to ten spear-shaped leaflets: the flowers grow in loose terminal spikes, of a pale blue colour, on short peduncles.—Native of Virginia, and other parts of North America. This is propagated by seeds sown where the plants are to remain. If in a dry soil, the root will continue several years, and produce many spikes of flowers; and though the usual season of flowering is in June and July, yet when rain falls in August, fresh stalks arise from the roots, which flower at the end of September, or the beginning of October.

2. Lupinus Albus; *White Lupine.* Calices alternate, without appendicles; upper lip entire, lower three-toothed. Stalk upright, about two feet high, dividing towards the top into several smaller hairy branches; leaves digitate, composed of seven or eight narrow oblong leaflets, joining at the base, hairy, of a dark grey colour, and have a silvery down. The flowers are produced in loose spikes at the end of the branches; they are white and sessile, appearing in July, and ripening seeds in autumn. The leaves have the sides contracted at night, and hang down, being sent back to the petiole.—It grows naturally in the Levant, and is cultivated in some parts of Italy, as other pulse, for food: likewise in the south of France, in poor dry extensive plains, as a meliorating crop, to be ploughed in where no manure is to be had, and the ground is too barren for clover or other better plants. A decoction of the seeds of this plant increases the urinary secretions, removes obstructions of the menses, and is frequently found serviceable in the jaundice, and the beginning of dropsical complaints. It is likewise an excellent lotion for children's sore heads, speedily cleansing and disposing them to heal. Sweetened with honey, it destroys worms in the intestines.

3. Lupinus Varius; *Small Blue Lupine.* Calices half-whorled, appendicled; upper lip bifid, lower slightly three-toothed. Annual: stalk firm, straight, channelled, nearly three feet high, divided towards the top into several branches; corolla light blue. It flowers in July.—Native of the south of France, Spain, Italy, and Sicily.

4. Lupinus Hirsutus; *Great Blue Lupine.* Calices alternate, appendicled; upper lip two-parted, lower three-toothed. Annual: stalk strong, firm, channelled, from three to four feet high, covered with a soft brownish down, dividing upward into several long branches, garnished with digitate leaves, composed of nine, ten, or eleven wedge-shaped hairy leaflets. The flowers are placed in whorls round the stalks above each other, forming a loose spike, which proceeds from the ends of the branches; they are large, and of a beautiful blue colour, but have no scent.—This and the next species are generally late in ripening the seeds, so that unless the autumn prove warm and dry, they do not ripen; therefore the best way to have good seeds is to sow them in September, close to a warm wall, on dry ground, where they will live through our ordinary winters; and these plants will flower early in the following summer, so that there will be time for the seeds to ripen before the rains fall in the autumn, which frequently rots those seeds which are not ripe. If a few of the seeds of both be sown in small pots the beginning of September, and, when the frosts begin, the pots be removed into a common hot-bed frame, where they may be protected from hard frost, but enjoy the free air in mild weather, the plants may be thus secured in winter; and in the spring they may be shaken out of the pots, preserving the earth to their roots, and planted in a warm border, where they will flower early, and produce very good seeds.

5. Lupinus Pilosus; *Rose Lupine.* Calices in whorls, appendicled; upper lip two-parted, lower entire. Corollas of a pale flesh-colour. It flowers in July and August.—Native of the south of Europe.

6. Lupinus Angustifolius; *Narrow-leaved Blue Lupine.* Calices alternate, appendicled; upper lip two-parted, lower entire. Flowers blue; seeds ovate, globular.—Native of Spain and Sicily.

7. Lupinus Luteus; *Yellow Lupine.* Calices in whorls, appendicled; upper lip two-parted, lower three-toothed. Stem a foot high, branching; leaves digitate, composed of seven, eight, or nine narrow hairy leaflets, nearly two inches long; flowers yellow, odorous, in loose spikes at the end of the branches.—This is very much esteemed for its sweetness, though the flowers are of short duration, especially in warm weather; therefore the seeds should be sown at several times, that there may be a succession of flowers through the season, for they will continue flowering till they are stopped by hard frost; and those which come to flower, will continue in beauty a longer time than the early ones.

8. Lupinus Cochin-chinensis; *Single-leaved Lupine.* Calices appendicled, in spikes; upper lip bifid, lower three-toothed; leaves simple, oval. Stem herbaceous, annual; flowers yellow.—Native of Cochin-china, and Bengal.

9. Lupinus Africanus. Calices appendicled, five-cleft; peduncles many-flowered, terminating; leaves ternate, lanceolate; stem shrubby, diffused; flowers yellow.—Native of the eastern coast of Africa.

10. Lupinus Trifoliatus. Calices five-toothed; legumes in spikes, upright; leaves ternate, ovate; stem herbaceous; flowers blue.—Native of Mexico.

11. Lupinus Nootkatensis. Stalk and stalk-leaves rough; leaves digitate; folioles seven or eight, lanceolate, obtuse; calix verticillate; upper lip emarginate, lower one entire.—Found on the north-west coast of America.

12. Lupinus Sericea. Stalk and leaves sericeo-tomentose; leaves digitate; folioles seven or eight, lanceolate, acute; calix subverticillate, inappendiculate; upper lip cut, lower one entire; flowers pale purple, or rose-coloured.—Found on the banks of the Kooskoosy, in North America.

13. Lupinus Argenteus. Leaves digitate; folioles from five to seven, linear-lanceolate, acute; calix alternate, inappendiculate; upper leaf obtuse, lower one entire; flowers small, cream-coloured.—Grows on the banks of the Kooskoosy, in North America.

14. Lupinus Pusillus. Plant perennial, very villose; leaves simple, oblong; spikes elongated; calices alternate, inappendiculate; upper lip bifid, lower one entire, elongated. The flowers are very variable in colour; white, rose-red, and purple. A beautiful plant, but very difficult of cultivation.—It grows in the dry sand-fields of Carolina and Florida.

Lychnis; a genus of the class Decandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, oblong, membranaceous, five-toothed, permanent. *Corolla:* petals five; claws the length of the calix, flat, margined; border often cloven, flat. *Stamina:* filamenta ten, longer than the calix, alternately shorter, each of these fixed to a claw of each petal; antheræ incumbent. *Pistil:* germen subovate; styles five, awl-shaped, longer than the stamina; stigmas reflex against the sun, pubescent. *Pericarp:* capsule approaching to an ovate form, covered, one, three, or five celled, five-valved. *Seeds:* very many, roundish.—Essential Character. *Calix:* one-leafed, oblong, even. *Petals:* five, with claws, and a subbifid border. *Capsule:* five-celled; Gærtner says, in most one-celled.——The species are,

1. Lychnis Chalcedonica; *Scarlet Lychnis.* Flowers fascicled, fastigiate. Root perennial; stems three feet high, upright, stiff, round, jointed, hairy, at every joint two large

leaves of a brownish green colour; flowers terminating, in large flat-topped tufts, consisting of several bundles; corolla of a scarlet or bright red orange colour, varying to white, blush, and variable, that is, pale red, growing paler till it becomes almost white.—Native of Russia and Japan. There are three varieties: that with double flowers is a valuable plant. The root has two, three, or four strong erect hairy stalks, garnished the whole length with spear-shaped leaves sitting close to them. The flowers, which are of a most beautiful scarlet colour, are produced in close clusters sitting at the top of the stalk; and when the roots are strong, the clusters of flowers will be very large, and make a fine appearance. They appear at the latter end of June, and in moderate seasons continue nearly a month in beauty. The stalks decay in autumn, and new ones rise in the spring.—The single Lychnis are easily propagated by seeds, sown on a border exposed to the east, in the middle of March. They will appear in April, when, if the season be dry, they should be refreshed with water two or three times a week. By the beginning of June the plants will be fit to remove, when there should be a bed of common earth prepared to receive them; into which they should be planted at about four inches apart, observing to water and shade them till they have taken new root; after which they will only require to be weeded until the following autumn, when they should be transplanted into the borders of the pleasure-garden, where they are to continue. The summer following, these plants will flower, and produce ripe seeds; but the roots will abide several years, and continue to flower. It may also be propagated by offsets; but as the seeds ripen freely, few persons trouble themselves to propagate the plants any other way. The double-flowered variety is propagated by slips taken from the roots in autumn; but as this is a slow method of increasing the plants, the best way to have them in plenty, is to cut off the flower-stalks in June before the flowers appear. These may be cut into small lengths of three or four joints each, which should be planted on an east border of soft loamy earth, putting three of the joints into the ground, leaving one eye just level with the surface; these must be watered, and then covered close with bell or hand glasses, excluding the outward air, and shaded with mats when the sun shines hot upon them. The cuttings so managed will put out roots in five or six weeks, when they must be exposed to the open air, and in very dry weather should be now and then refreshed with water, but it must not be repeated too often, nor given in large quantities, for too much moisture will cause them to rot. These roots will make good plants by the following autumn, when they may be transplanted into the borders of the pleasure-garden, and will flower there in the next summer.

2. Lychnis Flos Cuculi; *Red-flowered Meadow Lychnis.* Petals quadrifid; fruit roundish, one-celled. Root perennial, brownish white, subacrid; stems from one to three feet high, somewhat angular and grooved, swelled at the joints, purplish; corolla pink or purplish red, varying sometimes to white. It flowers in May and June.—Native of most parts of Europe in moist meadows. This plant has a variety of names in English, as Meadow Pink, Wild Williams, Cuckow-flower, Ragged Robin, Crow-flower. A variety with double flowers is frequently cultivated in flower-gardens for ornament. It only differs from the single in the multiplicity of the petals, and is commonly known by the title of Double Ragged Robin.—Found sometimes wild in England, as, near Bungay in Suffolk. This plant is increased by slipping the roots in September.

3. Lychnis Alpestris. Petals four-cleft, crowned: leaves recurved. Root perennial; stems a span high, upright, smooth; flowers white, in a dichotomous panicle.—Native of Switzerland and Austria.

4. Lychnis Quadridentata; *Four-toothed Lychnis.* Petals four-toothed; stem dichotomous; leaves smooth, recurved. Stems a span high.—Native of Austria.

5. Lychnis Coronata; *Chinese Lychnis.* Smooth: flowers axillary and terminating, solitary; petals laciniated. Stem simple, round, upright, a foot high. It flowers in June and July.—Native of China and Japan.

6. Lychnis Viscaria; *Viscous Lychnis*, or *Catchfly.* Petals nearly equal. Root perennial, yellowish on the outside, white within; stem round, not grooved; flowers terminating, in close whorls, all together forming a spike. It is called Narrow-leaved Catchfly, or Limewort, Red German Catchfly, Catchfly Cuckow flower, and Viscous Lychnis. It is scarce in Great Britain, but has been found in Wales; upon the rocks in Edinburgh Park; and near Croydon, in Surry. It flowers in May and June. This plant has the name of *Catchfly*, from exuding a glutinous liquor, almost as clammy as birdlime; so that any insect attempting to creep up to the flowers, is fastened to the stalk.—Native of most parts of Europe, in dry and mountainous pastures, especially among bushes. This plant is propagated by parting the roots in autumn, at which time every slip will grow; or if the seeds be sown in the same manner as is directed for the first sort, the single flowers may be produced in plenty: the double flowers, however, have almost excluded them from our gardens. These never produce seeds, and can only be propagated by parting and slipping the roots; the best time for which is autumn, when every slip will grow. If this be performed in September, the slips will have taken good root before the frost, and will flower well the following summer; but if they are expected to flower strong, the roots must not be divided into small slips, though for multiplying the plants it matters not how small the slips are. They should be planted on a border exposed to the morning sun, and shaded when the sun is warm till they have taken root. If the slips are planted in the beginning of September, they will be rooted strong enough to plant in the borders of the flower-garden by the middle or latter end of October. The roots of this multiply so fast, as to make it necessary to transplant and part them every year; for when they are let remain longer they are very apt to rot.

7. Lychnis Alpina; *Alpine Lychnis.* Petals bifid; flowers four-styled. Root perennial; petals purple; anthers red.—Native of the Alps in Europe, and Siberia. It flowers in May. This, and the ninth species, are propagated by seeds, and also by parting the roots. The roots may be parted, and the plants removed, in autumn. The seeds may be sown upon a shady border in March, keeping the ground moist in dry weather. When the plants are of a size to remove, transplant them into a shady border, where they may remain to flower.

8. Lychnis Læta; *Small Portugal Lychnis*, or *Campion.* Petals bifid; flowers solitary; leaves linear-lanceolate, smooth; calices ten-keeled.—Annual, and a native of Portugal. This is increased by slips, in the same manner as above, but coming from a warm country, it is impatient of cold, and will not live through the winter in an open border, nor does it thrive well in a pot. It succeeds best when planted close to a south wall in dry undunged earth, or brick-rubbish; for in rich or moist ground the root presently rots, as they also do when they are watered.

9. Lychnis Sibirica; *Siberian Lychnis.* Petals bifid; stem dichotomous; leaves somewhat rough-haired. Root perennial; petals white.—Native of Siberia. See the seventh species.

10. Lychnis Diurna; *Rose-flowered Lychnis*, or *Wild Red Campion*. Flowers dicœous; capsules one-celled, roundish. Root perennial, the thickness of the little finger; stalks several, upright, from one to three feet high; petals purple. It flowers in May and June.—Native of many parts of Europe, in moist shady ditches, by the sides of hedges, and sometimes in woods. A variety of this with double flowers is cultivated in gardens by the name of *Red Bachelor's Buttons*. It is an ornamental plant, and continues long in flower.—The double varieties, both red and white, are propagated by slips in the beginning of August, in a shady border of loamy earth, where they will take root in six weeks or two months, and may then be transplanted into the borders of the flower-garden. These roots should be annually removed, otherwise they frequently rot: and young plants must be propagated by slips to supply the decay of the old roots, which are not of very long duration. The red thrives best in a soft loamy soil, and in a shady situation, where it has only the morning sun: the double white does not make so good an appearance as the red, but will thrive in a drier soil, and a more open exposure.

11. Lychnis Vespertina; *White-flowered Lychnis*, or *Wild White Campion*. Flower dicœous; capsules one-celled, conical. This is distinguished from the preceding by its calix, which is thicker, harder, almost cartilaginous, covered with veins forming a net; the stalks are branched out much more than in it; the leaves are longer, and more veined; and the flowers stand singly upon pretty long peduncles, and not in clusters, appearing a month after the red.—Common in Sweden, Silesia, at the foot of the Alps, and with us in Cambridgeshire. For cultivation, &c. see the preceding.

12. Lychnis Apetala. Calix inflated; corolla shorter than the calix; flowers hermaphrodite, one or two on the stem. Root fibrous; stem single, upright, a span high, entire. A single flower generally terminates the stem, nodding horizontally.—Native of the mountains of Lapland and Siberia.

Lycium; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth subquinquefid, obtuse, erect, very small, permanent. *Corolla:* monopetalous, funnel-form; tube cylindric, spreading, incurved; border five-parted, obtuse, spreading, small. *Stamina:* filamenta five, awl-shaped, from the middle of the tube, shorter than the corolla, closing the tube with a beard; antheræ erect. *Pistil:* germen roundish; style simple, longer than the stamina; stigma bifid, thickish. *Pericarp:* berry roundish, two-celled. *Seeds:* several, kidney-form; receptacles convex, affixed to the partition. Essential Character. *Corolla:* tubular, closed at the throat by the beard of the filamenta. *Berry:* two-celled, many-seeded. ——The species are,

1. Lycium Japonicum; *Japan Box-thorn*. Unarmed: leaves ovate, nerved, flat; flowers sessile. This shrub is scarcely a fathom high, very much branched, upright.—It is frequently planted for hedges in Japan, where it is a native. This, with the second, third, fifth, sixth, eleventh, and twelfth, may be increased by seeds, cuttings, or layers. If by seeds, they should be sown in the autumn, soon after they are ripe; for if they are kept out of the ground till spring, they seldom come up the first year. If the seeds be sown in pots, the pots should be plunged into some old tan in the winter, and in very severe frost covered with pease-haulm or straw, but in mild weather should be open to receive the wet. In the spring, the pots ought to be plunged into a moderate hot-bed, which will soon bring up the plants, which must be inured to bear the open air as soon as the danger of frost is over; and when they are three inches high, they may be shaken out of the pots, and each planted in a small separate pot, filled with loamy earth, and placed in the shade till they have taken new root, when they may be removed to a sheltered situation, where they may remain till the autumn; then they should be removed either into the green-house, or placed under a hot-bed frame to shelter them from hard frost: for these plants being too tender to live in the open air in England, they must be kept in pots, and treated in the same way as Myrtles, and other hardy green-house plants; but when the plants are grown strong, there may be a few of them planted in the full ground in a warm situation, where they will live in moderate winters. If the cuttings of these plants be planted in a shady border in July, and duly watered, they will take root, and may then be treated in the same way as the seedling plants.

2. Lycium Barbatum. Unarmed; leaves ovate, smooth: branches flexuose; flowers panicled.—Native of the Cape.

3. Lycium Africanum; *African Box-thorn*. Thorny: leaves linear, fascicled; branches stiff; stem straight, rigid.—Native of the Cape. There is a variety with purplish white flowers; native of France, Spain, and Italy, in hedges.

4. Lycium Ruthonicum. Thorny: leaves linear, fascicled; branches hanging down. This is a shrub six feet high; flowers two or four together, outwardly pale, and of a greenish purple. This, with the eighth and ninth species, are hardy, and may be increased by cuttings or layers.—Native country unknown.

5. Lycium Tetrandrum. Thorny: leaves ovate, obtuse; branches angular; corollas four-cleft.—Native of the Cape of Good Hope. See the first species.

6. Lycium Boerhaaviæfolium; *Glaucous-leaved Box-thorn*. Thorny: leaves ovate, quite entire, acute, glaucous; flowers panicled. Stem upright, round, branched, full of chinks, ash-coloured; corolla blue, sweet-smelling; branches alternate, spreading, smooth.—Native of Peru. See the first species.

7. Lycium Barbarum; *Willow-leaved Box-thorn*. Thorny: leaves lanceolate; branches loose; calices bifid. This is a weak, nodding, and decumbent shrub.—Native of Europe, Asia, and the Cape. It is increased by cuttings planted in the spring, before they begin to shoot, in a border exposed to the morning sun. They should not be removed till the autumn, when they may be planted to cover walls; for the branches are too weak to support themselves.

8. Lycium Europæum; *European Box-thorn*. Thorny: leaves oblique; branches flexuose, round. The Spaniards eat the tender shoots of this shrub with oil and vinegar: and Michael says, that it is used for hedges in Tuscany, where they call it *Spina da corone di crocifissi;* supposing it, in common with several other prickly shrubs, to be that of which our Saviour's crown of thorns was made.—Native of the south of Europe, Spain, Portugal, France, and Italy.

9. Lycium Tataricum; *Tartarian Box-thorn*. Thorny: leaves linear, fascicled; branches supine. This is an elegant shrub, on account of the whiteness of the branches, rods, or twigs, which are many, a foot or eighteen inches long, or more, branched, ascending; tube of the corolla white.—Native of Tartary, about the Volga.

10. Lycium Capsulare. Thorny: leaves lanceolate, thin, smooth; peduncles and calices pubescent; pericarps capsular.—Native of Mexico.

11. Lycium Cinereum. Leaves lanceolate, smooth; branches spinescent; peduncles very short.—Native of the Cape.

12. Lycium Horridum. Thorny: leaves obovate, fleshy, smooth; branches spinescent; peduncles very short; flowers white.—Native of the Cape.

13. Lycium Cochin-chinense. Unarmed: leaves oblong

blunt; cymes terminating. A shrub four feet high; flowers white.—Native of Cochin-china, in woods.

14. Lycium Carolinianum; *Carolina Box-thorn.* Leaves spatulate-oblong; branches without spines; flowers four-cleft.—Native of rushy marshes in Carolina, Georgia, and Florida.

Lycoperdon; a genus of the class Cryptogamia, order Fungi. —Generic Essential Character. *Fungus:* roundish, fleshy, firm, becoming powdery, and opening at the top. *Seeds:* fixed to filamenta, connected with the inner coat of the plant.—These singular Fungi are described by Dr. Withering, who enumerates 25 British species: see his *Arrangement.* There is also an elaborate dissertation on the British Stellated Lycoperdons, by Mr. Woodward, in the second volume of the *Transactions of the Linnæan Society of London.*

Lycopodium; a genus of the class Cryptogamia, order Musci.—Generic Essential Character. *Fructifications:* in the axils of the scales, digested into long imbricate spikes, or of the leaves themselves, sessile. *Capsule:* kidney-shaped, two-valved, elastic, many-seeded. *Veil:* none.—This genus holds as it were an intermediate place between the Ferns and Mosses. Only six species of Club Moss are natives of Great Britain; but the total number is 65. See Murray's edition of the *Systema Vegetabilium.*

Lycopsis; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted; segments oblong, acute, spreading, permanent. *Corolla:* one-petalled, funnel-form; tube cylindric, from curved bent; border half five-cleft, blunt; throat closed with five convex, prominent, converging scales. *Stamina.* filamenta five, very small, at the bending of the tube of the corolla; antheræ small, covered. *Pistil:* germina four; style filiform, the length of the stamina; stigma blunt, bifid. *Pericarp:* none; calix very large, inflated. *Seeds:* four, longish. *Observe.* The essence of this genus consists in the curvature of the tube of the corolla. Essential Character. *Corolla:* with the tube bent in.——The plants of this genus are hardy, and will generally rise from scattered seeds, but do not bear transplanting well; they are,

1. Lycopsis Vesicaria; *Bladder-podded Wild Bugloss.* Leaves quite entire; stem prostrate; fruiting calices inflated, pendulous. Root annual; flowers axillary, appearing in June and July.—Native of dry hills in the south of Europe.

2. Lycopsis Pulla; *Dark-flowered Wild Bugloss.* Leaves quite entire; stem upright; fruiting calices inflated, pendulous. Perennial: corolla small, dark, blackish, purple.—Native of dry pastures in Austria and Germany.

3. Lycopsis Variegata; *Variegated Wild Bugloss.* Leaves repand-toothed, callous; stem decumbent; corollas drooping. A low trailing plant: the flowers small, bright blue, collected into small bunches at the extremity of the branches. It varies with red flowers elegantly streaked with white.—Native of Nice; and the island of Candia, on the walls of the city: observed also on mount Hymettus, near Athens.

4. Lycopsis Arvensis; *Small Wild Bugloss.* Leaves lanceolate, hispid, flowering; calices upright. Root annual, simple, fibrous, whitish. It is an extremely harsh, rough, and bristly plant; stems thick, a foot or more high; flowers in spikes, all on one side; corolla sky-blue, varying to red and white. It has lately been recommended as a remedy for the anthrax, or corrosive ulcer, commonly called a Carbuncle, by laying the bruised plant on the tumor. It flowers from May to July.—Native of most parts of Europe, in cornfields with sandy soil, and on dry banks.

5. Lycopsis Bullata; *Bladdery-leaved Wild Bugloss.* Leaves lanceolate-ovate, hispid, bladdery; stem procumbent. Probably this is a variety of the preceding: root annual, simple.—Common on waste grounds about Naples.

6. Lycopsis Orientalis; *Oriental Wild Bugloss.* Leaves ovate, quite entire, rugged; calices upright; annual.—Native of the Levant.

7. Lycopsis Virginica; *Virginian Wild Bugloss.* Leaves linear-lanceolate, clustered, tomentose, soft; stem upright. Perennial.—Native of Virginia.

Lycopus; a genus of the class Diandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, tubular, half five-cleft; segments narrow, acute. *Corolla:* one-petalled, unequal; tube cylindrical, the length of the calix; border four-cleft, blunt, spreading; segments almost equal, upper broader, emarginate, lower smaller. *Stamina:* filamenta two, commonly longer than the corolla, inclining to the upper segment; antheræ small. *Pistil:* germen four-cleft; style filiform, straight, the length of the stamina; stigma bifid, reflex. *Pericarp:* none; calix containing the seeds in its bottom. *Seeds:* four, roundish, retuse. Essential Character. *Corolla:* four-cleft, with one division, emarginate; stamina distant. *Seeds:* four, retuse.——The species are,

1. Lycopus Europæus; *Water Horehound.* Leaves sinuate-serrate. Root perennial, creeping; stalk square; flowers in dense whorls, numerous, small; corolla white, with a tinge of purple. The leaves vary, more or less hairy, and divided. It dyes black, and gives a permanent colour to wool and silk. Gypsies are said to stain their skins with it; and it would probably be essentially useful to dyers, if more regarded.—Common in all parts of Europe, in meadows, and on the banks of streams and ponds; flowering from July to September. The Germans call it *Wolfsfuss,* &c. the French, *Marrube Aquatique, Patte de Loup;* and the Italians, *Licopo.*

2. Lycopus Virginicus; *Virginian Water Horehound.* Leaves equally serrate, lanceolate.—Native of Virginia.

3. Lycopus Exaltatus; *Lofty Water Horehound.* Leaves pinnatifid-serrate at the base; stem the height of a man; corollas four-cleft, white.—Native of Italy.

4. Lycopus Pumilus. Leaves lanceolate, subserrate, glabrous; stolones procumbent; flowers solitary; stem low.—Found in Canada.

5. Lycopus Obtusifolius. Leaves lanceolate, obtusely serrated.—Found at Hudson's Bay.

Lygeum; a genus of the class Triandria, order Monogynia. —Generic Character. *Calix:* spathe one-leafed, convolute, ovate, acuminate, opening downwards, permanent. *Corolla:* in pairs, placed on the germen, equal all ways; glume of the corollet two-valved, outer valve convex, oblong, acute, smaller, inner linear, narrow, twice as long, bifid, acute. *Stamina:* (to each) filamenta three, very slender, flattish, long; antheræ linear. *Pistil:* germen common to both, hirsute, inferior to the corollas; style simple, flattish, long; stigma simple. *Pericarp:* nut oblong, extremely hirsute, two-celled, not opening. *Seeds:* solitary, linear-oblong, convex on one side, flattish on the other. Essential Character. *Corolla:* two on the same germen. *Nut:* two-celled.——The only known species is,

1. Lygeum Spartum; *Rush-leaved Lygeum,* or *Bastard Matweed.* The Spaniards use it for making baskets and ropes, and also for filling their palliasses, or lower mattresses. They call both this and Stipa Tenacissima, which is used for the same purposes, by the name of *Esparto.*—It is a native of Spain, in clayey fields, where it flowers in March; and with us in May and June.

Lyme Grass. See *Elymus.*

Lysimachia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, acute, erect, permanent. *Corolla:* one-petalled, wheel-shaped; tube none; border five-parted, flat; divisions ovate-oblong. *Stamina:* filamenta five, awl-shaped, opposite to the divisions of the corolla; antheræ acuminate. *Pistil:* germen roundish; style filiform, the length of the stamina; stigma obtuse. *Pericarp:* capsule globular, mucronate, one-celled, ten-valved; according to Gærtner, five-valved. *Seeds:* very many, angular; receptacle globular, very large, dotted. *Observe.* In some species the stamina are united at the base. The ninth species has a five-cleft corolla, and a five-valved fruit. Essential Character. *Corolla:* wheel-shaped. *Capsule:* globular, mucronate, ten-valved; according to Gærtner, five-valved; with *Receptacle*, free; and *Seeds* with a ventral navel, opposite to the embryo.——The species are,

1. Lysimachia Vulgaris; *Common Loosestrife.* Panicled: racemes terminating. Root perennial, creeping; stem three feet or more high; leaves in pairs, or three, four, or five together, sessile, ovate, or lanceolate; corolla yellow.—Native of most parts of Europe, on the banks of streams, and in marshy meadows; flowering from the end of June to September. It derives the English name *Loosestrife*, from the quality ascribed to it by the ancients, of quieting oxen when put upon their yokes. This herb is of an astringent balsamic nature, and has the credit of being so excellent a vulnerary, that if the young leaves are bound about a fresh wound, they will immediately check the bleeding, and perform a cure in a very short time. Hill says, the root dried and given in powder is good against the whites, immoderate menstrual discharges, the bloody flux, and purgings. The Germans call it *Gelbe Weiderich;* the Dutch, *Gemeene Weiderich;* the Danes, *Fredlös;* the French, *Lisimaque Vulgaire;* and the Italians, *Lisimachia.* —This, together with the fifth and eighth species, though not often admitted into gardens, because their creeping roots are troublesome, still deserve cultivation, for the beauty of their large flowers; especially as they will grow in moist places, where nothing better will thrive.

2. Lysimachia Ephemerum; *Willow-leaved Loosestrife.* Racemes terminating; petals obovate, spreading; leaves linear-lanceolate, sessile. Root perennial; stems several, upright, more than three feet high; flowers in a long close upright spike; corolla white.—Native of Spain. This, which is the finest plant of the genus, may be propagated by parting the roots in autumn; but this method increases it slowly; so that the best way is to sow the seeds upon an eastern-aspected border soon after they are ripe, in autumn, then the plants will come up the following spring; but those which are sown in the spring will not grow the same year. When they come up, they should be kept clean from weeds; and if they are too close, some of them may be drawn out, and transplanted on a shady border; which will give the remaining plants room to grow till autumn, when they may be transplanted into the borders of the flower-garden, where they are designed to flower: after which, they will require no other culture but to keep them clean from weeds, and dig the ground between them every spring. It is very ornamental for shady borders, and deserves a place in every pleasure-garden, delighting in a moist soil, where it will continue long in beauty.

3. Lysimachia Stricta; *Upright Loosestrife.* Racemes terminating; petals lanceolate, spreading; leaves lanceolate. Stem erect, four-cornered, smooth. After flowering, it throws out bulbs from the axils, which falling off in October, produce young plants in the ensuing spring.—Native of swampy ground in North America. It increases by its bulbs; and requires a very moist situation.

4. Lysimachia Dubia; *Purple-flowered Loosestrife.* Racemes terminating; petals converging; stamina shorter than the corolla; leaves lanceolate, petioled. It flowers in July and August.—Native of the Levant. It is propagated by seeds sown on a moderate hot-bed in the spring; often watering the ground, to bring up the plants, if the season should prove warm. The glasses of the hot-bed should be shaded in the heat of the day. When the plants are up, they should have a large share of fresh air admitted to them, and ought to be frequently refreshed with water: when they are fit to remove, plant each in a separate pot, plunging them into a moderate hot-bed, to forward their taking new root; after this, inure them gradually to bear the open air, into which they should be removed at the begining of June, and remain till October, when they should be placed under a common frame, where they may be sheltered from frost in winter; but always partake of free air in mild weather. The spring following, some of the plants may be shaken out of the pots, and planted in borders; but a few should be put into larger pots, where they may flower and seed.

5. Lysimachia Thyrsiflora; *Tufted Loosestrife.* Racemes lateral, peduncled. Root perennial, creeping and spreading in the mud, bearded with long fibres; stems in tufts, porous, jointed, round, succulent; flowers in racemes; corolla small, yellow.—Native of many parts of Europe, in bogs, marshes, ponds, ditches, and banks of rivers. Though not common in England, it has been found near King's Langley, in Hertfordshire; in Yorkshire; and in the isle of Anglesea, North Wales: also along the banks of the river Ballynahinch, above the bridge, near Belfast, Ireland.—See the first species.

6. Lysimachia Quadrifolia; *Four-leaved Loosestrife.* Leaves in fours, ovate-acute; peduncles in fours, one-flowered; flowers yellow.—Native of Virginia.

7. Lysimachia Punctata; *Dotted Loosestrife.* Leaves in fours, subsessile; peduncles in whorls, one-flowered. Flowers small; corolla yellow.—Native of Holland, among reeds; Austria, Silesia, &c.

8. Lysimachia Ciliata; *Ciliated Loosestrife.* Petioles ciliated; flowers drooping. Stalks many, erect, about two feet high; flowers like those of the common sort, but smaller, hanging down.—Native of Canada and Virginia.

9. Lysimachia Linum-Stellatum; *Small Loosestrife.* Calices exceeding the corolla; stem upright, very much branched. This is an annual plant, two inches, seldom three, high, from a slender whitish hair-like root. The leaves are short, ending in a fine point; flowers small, pale green, or herbaceous, stellate.—Native of France and Italy; flowering in the spring.

10. Lysimachia Nemorum; *Wood Loosestrife,* or *Yellow Pimpernel.* Leaves ovate, acute; flowers solitary; stem procumbent. Root perennial, with whitish fibres; stems several, roundish, grooved on each side alternately, smooth, red, rooting from the lower joints; corolla yellow. When the flowers are expanded, they somewhat resemble in shape those of Anagallis Arvensis, or Common Red Pimpernel: and hence the botanists of former times considered it as an Anagallis. It differs from the next species, to which it bears no small affinity in its general habit, in having the leaves more pointed, the flowers smaller, less bell-shaped, and on much longer peduncles, and the stalks generally redder.—Native of many parts of Europe, in moist woods; flowering from June to September: found in Charlton wood; Hanging-wood, near Woolwich; Shooter's-Hill wood; between Dartford-road and Leeson-heath; also between Muswell-hill and Highgate; in Canewood; at Scarlet Spring, near Harefield; in Stow and Stokenchurch woods, in Oxfordshire; at Pychley, in Northamptonshire; and near Nottingham.

11. Lysimachia Nummularia; *Creeping Loosestrife*, or *Moneywort*. Leaves subcordate; flowers solitary; stem creeping. Root perennial, with simple fibres, striking downwards; corolla yellow, about the same size with the leaves. The whole plant is smooth. The leaves of this plant are subastringent, and slightly acid; hence Boerhaave recommended them in the hot scurvy and hæmorrhages: they are best given in powder, in doses of ten grains. The juice of the leaves is a well-known remedy among country people for overflowing of the menses; and the roots dried and powdered are good in purgings. It is also a good antiscorbutic; and the leaves bruised, and applied to green wounds, speedily heal them. It is called Nummularia, from the leaves being shaped like money; hence our *Moneywort*, *Herb Two-pence*, and *Two-penny Grass:* which names are translated into all the languages of modern Europe.—Native of most parts of Europe, in moist meadows, on the sides of ditches, and under hedges, in moist situations: flowering in June and July.

12. Lysimachia Japonica; *Japan Loosestrife*. Leaves subcordate; flowers axillary; peduncles shorter than the leaf. Root annual, fibrous; stem filiform, decumbent; flowers two together. Native of Japan.

13. Lysimachia Angustifolia. Leaves opposite and verticillate, longo-linear, punctated; raceme terminal, short; laciniæ of the corolla oblong; flowers yellow, very small.—Found in Lower Carolina.

14. Lysimachia Heterophylla. Leaves opposite, linear, sessile, ciliated at the base; root-leaves suborbiculate; flowers stooping.—Grows in wet meadows, from Virginia to Georgia.

Lythrum; a genus of the class Dodecandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, cylindric, striated; with twelve teeth, alternately smaller. *Corolla:* petals six, oblong, bluntish, spreading, with the claws inserted into the teeth of the calix. *Stamina:* filamenta twelve, filiform, the length of the calix, the upper ones shorter than the lower; antheræ simple, rising. *Pistil:* germen oblong; style awl-shaped, the length of the stamina, declined; stigma orbiculate, rising. *Pericarp:* capsule oblong, acuminate, straight, two-celled, or one-celled. *Seeds:* numerous, small. *Observe.* In some species, one-sixth part of the number is taken from the flower; others have only six stamina. Essential Character. *Calix:* twelve-toothed. *Petals:* six, inserted into the calix. *Capsule:* two-celled, many-seeded.——The species are,

1. Lythrum Salicaria; *Common* or *Purple Willow-herb*. Leaves opposite, cordate-lanceolate; flowers in spikes, twelve-stamined. Root perennial, thick, branched, somewhat woody, widely extended; stem from two or three to four or six feet high, upright, tinged with red; flowers in clusters, placed at a little distance from each other, in the axils of the leaves, each consisting of about eight flowers, forming a long leafy spike; corolla red-purple.—Native of most parts of Europe, in marshes, and on the banks of rivers, ponds, and ditches; flowering late in the summer. It is astringent; and is recommended by De Haen, and several other foreign physicians, in long-protracted diarrhœas and dysenteries. A decoction, or the expressed juice, is given from one to three ounces. When dried and powdered, it imbibes a great quantity of water, before it loses its glutinosity. It has been successfully used in tanning leather; and seems in general to remain untouched by cattle; though Schreber asserts that they feed upon it. The Germans call it *Braune Weiderich;* the Dutch, *Partyke;* the French, *Salicaire:* the Italians, *Salicaria;* and the Russians, *Plakun*. There are several varieties of this handsome plant; which deserve a place in large gardens and plantations, and may be easily cultivated, by parting the roots in autumn; but should be planted in a moist soil.

2. Lythrum Virgatum; *Fine-branched Willow-herb*. Leaves opposite, lanceolate; panicle virgate; flowers twelve-stamined, in threes. Root perennial, thick; stems upright, panicled, from a foot to two feet in length.—Native of Austria, Silesia, and Siberia. This, with the other hardy foreign sorts, No. 4, 5, and 6, may be increased by parting the roots. When raised from seed, they should be sown in autumn; otherwise they will remain a year in the ground.

3. Lythrum Fruticosum; *Shrubby Willow-herb*. Leaves opposite, subtomentose underneath; flowers ten-stamined; corolla shorter than the calix; calix shorter than the genitals. This shrub has a lacerated bark; flowers solitary, peduncled, subterminating.—Native of China. This, and most of the following species, are too tender to live in the open air. Sow the seeds in pots, and plunge them into an old hot-bed: they will not rise, unless they are sown in autumn. Shelter them through the winter, and in spring place them in a fresh hot-bed: after which, treat them as other tender plants from hot countries.

4. Lythrum Verticillatum; *Whorled Willow-herb*. Leaves opposite, tomentose underneath, subpetioled; flowers in whorls, lateral, pale purple; peduncles many-flowered, very short.—Native of Virginia.

5. Lythrum Petiolatum; *Footstalk-leaved Willow-herb*. Leaves opposite, linear, petioled; flowers twelve-stamined; they are axillary, solitary, small, and of a pale purple colour, appearing in July.—Native of Virginia.

6. Lythrum Lineare; *Linear-leaved Willow-herb*. Leaves opposite, linear; flowers opposite, six-stamined, white; stem slender, about a foot high.—It flowers in June; and is a native of Virginia.

7. Lythrum Parsonsia. Leaves opposite, oval; flowers alternate, six-stamined, sessile; stem diffused. Roots filiform; stem slender, prostrate, or creeping; flowers pale red.—Native of Jamaica and Hispaniola; flowering the whole year.

8. Lythrum Melanium. Leaves opposite, ovate; flowers alternate, mostly ten-stamined; stem prostrate. This is a weakly plant, with a slender stem, well supplied with branches towards the top; and having a disagreeable smell, approaching much to that of Guinea-hen Weed, but more subtile, and less perceptible when placed close to the nose. Swartz distinguishes it by the alternate situation of the flowers.—Native of Jamaica, in the cane-pieces.

9. Lythrum Cordifolium; *Heart-leaved Willow-herb*. Leaves oppositie, insubsessile, cordate, acute, rugged; racemes terminating and axillary; flowers ten-stamined.—Native of Hispaniola.

10. Lythrum Ciliatum; *Ciliated Willow-herb*. Leaves opposite, petioled, ovate, smooth, ciliated; racemes terminating; flowers mostly pointing one way, ten-stamined.—Native of Jamaica.

11. Lythrum Cuphea; *Clammy Willow-herb*. Leaves opposite, petioled, ovate-oblong, somewhat rugged; flowers twelve-stamined. Root fibrous, annual; stalk delicate, slender, round, upright, ten inches or a foot in height, pubescent, purple; branches few, alternate, simple; petals unequal, the two upper ones larger. It flowers in July and August.—Native of Brazil and Jamaica. See the third species.

12. Lythrum Triflorum; *Three-flowered Willow-herb*. Very smooth: leaves opposite, subsessile, lanceolate, entire; peduncles axillary, opposite; head three-flowered. Root perennial. This species is easily distinguished from the rest, by its filiform peduncles, terminated by two lanceolate, channelled, spreading

bractes, longer than the flower, and between these three regular flowers, on short pedicels, blue, and small. Jussieu however doubts whether it really belongs to this genus.—Native of America.

13. Lythrum Pemphis. Shrubby, hirsute: leaves opposite, oblong, entire; flowers axillary, peduncled, solitary; capsule cut round horizontally, one-celled. This is a hoary shrub.—Found on the coast of Ceylon; and by Forster, in the island of Teautea, in the South Sea.

14. Lythrum Racemosum. Diffused: leaves opposite, petioled, ovate; racemes terminating; flowers opposite.—Native of South America.

15. Lythrum Dipetalum. Hispid-viscid: leaves in threes, or opposite, sessile, ovate; flowers axillary, nodding, two-petalled; petals large, inserted into the upper margin of the calix, erect, obovate, violet or blue. The flowers, which are handsome, render this a very distinct species.—Native of South America.

16. Lythrum Hyssopifolia; *Hyssop-leaved Willow-herb.* Leaves alternate, linear; flowers six-stamined. Root annual; stems prostrate, stiffish, simple, or branched, and only near the root, rod-like; colour of the flowers blue. Linnæus says, purple, and white at the base; Mr. Miller, light purple; and Krocker describes the petals as rose-coloured. Villars says, the leaves are very bitter. It is generally called *Grass Poly*, or *Small Hedge Hyssop.*—Native of many parts of Europe, as Germany, Switzerland, Austria, France, Italy; and England, in wet meadows, watery places, and especially where water stagnates in winter; but it does not seem to be very common any where. With us it is found on Hounslow Heath; between Staines and Laleham; on Histon, Hinton, and Feversham Moors; and at Oakington, in Cambridgeshire; on the Banbury Road, from Oxford, near the first turnpike-gate; at Feversham, in Kent, in the ditches near the abbey-pond; near the Wheat-sheaf, five miles beyond Huntingdon, on the north road; and about Wilford, in Northamptonshire. It flowers in July. Being annual, it must be raised from seeds, like the next species; but they are bog-plants, and seldom admitted into gardens.

17. Lythrum Thymifolia; *Thyme-leaved Willow-herb.* Leaves alternate, linear; flowers four-stamined. Root annual, very like the preceding, but only half, or one-third of the size; petals commonly four, rose-coloured. It flowers in August.—Native of the south of France, Italy, and Silesia, in moist meadows and ditches. See the preceding species; of which Krocker suspects it to be a variety.

18. Lythrum Americanum; *South American Willow-herb.* Leaves oblong-ovate, below opposite, above alternate; flowers six-stamined. The root is woody; from which arise two or three slender stalks upwards of two feet high; flowers small, white.—Found at La Vera Cruz, in swamps.

19. Lythrum Alatum. Plant very smooth; leaves opposite, ovate-oblong, acute, subcordated at the base; flowers axillary, solitary, sessile, hexandrous, small, purple.—It grows from three to four feet in height; and is found in Lower Georgia.

MAB

MABA; a genus of the class Dicœcia, order Triandria.—Generic Character. *Male. Calix:* perianth semi-trifid: divisions acute, villose. *Corolla:* one-petalled, tubular, villose on the outside; tube cylindric, longer than the calix; border trifid; divisions ovate, thickish, upright. *Stamina:* filamenta three, filiform, shorter than the calix; antheræ erect, ovate. *Pistil:* rudiment globular, subsessile, in the centre of the flower. *Female. Calix:* perianth inferior, permanent, as in the males. *Corolla* and *Pistil:* undescribed. *Pericarp:* drupe superior, ovate, oblong, two-celled; cells two-seeded. *Seeds:* nuts two, oblong, three-sided, somewhat convex at the back, with two plane sides. Essential Character. *Male. Calix:* trifid. *Female. Corolla:* trifid. *Drupe:* superior, two-celled.——The only known species is,

1. Maba Elliptica. This is a very smooth tree, with the twigs and young leaves hairy. Leaves alternate, on very short petioles, elliptic, veined, very smooth; peduncles axillary, short, often three-flowered; flowers small, and singular, having the outside of the calix and corolla more villose than any of the plant. There is another species, or variety, which Forster calls *Maba Major*, because the drupe or fruit is three times the size of the other; having three-sided kernels in the cells, which are tough and insipid: they are however eaten by the inhabitants, and were brought for sale to our people.—Native of the Friendly Islands.

Mabea; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male. Calix:* perianth, one-leafed, five-toothed, acute. *Corolla:* none. *Stamina:* filamenta nine to twelve, inserted into the bottom of the calix; antheræ roundish. *Female. Calix:* perianth one leafed, upright, five-toothed, acute. *Corolla:* none. *Pistil:* germen oblong, subtrigonal, longer than the calix; style long, (Jussieu asks, if it be not rather three styles glued together?) stigmas three, filiform, revolute, or twisted spirally. *Pericarp:* capsule covered with a thick bark, roundish, tricoccous, three-celled; cells bivalve, bursting elastically. *Seeds:* solitary, roundish.—Essential Character. *Male. Calix:* one-leafed, five-toothed. *Corolla:* none. *Filamenta:* nine to twelve, inserted into the bottom of the calix. *Female. Stigmas:* three, revolute. *Capsule:* covered with a thick bark, three-celled, three-seeded.——The species are,

MAC

1. Mabea Piriri. Leaves ovate-oblong, accuminated. A shrub, with the trunk six feet high, and about six inches in diameter: from this trunk rise, to a great height, several twiggy branches, which spread and catch upon the neighbouring trees. The flowers are borne in great numbers on the tops of the branches, ranged in a long panicle; the upper part of which sustains the male, and the lower the female flowers, which are about six or eight in number. All the parts of this shrub yield a milky juice. The Creoles and Negroes use the smaller branches for pipes; hence the tree is called Pipe-wood, *(Bois à Calumet.)*—Native of Guiana.

2. Mabea Taquari. Leaves ovate, obtuse, marked with red veins beneath. It differs from the preceding, in having a reddish bark, and larger leaves and fruit; but in other respects much resembles it.—Native of Guiana, where it is used for the same purposes as the former.

Macedonian Parsley. See *Bubon.*

Macrocnemum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, superior, turbinate, five-toothed, permanent. *Corolla:*

one-petalled, somewhat bell-shaped, five-cleft, divisions ovate, upright. *Stamina:* filamenta five, awl-shaped, villose, shorter than the corolla; antheræ ovate, compressed, in the jaws of the flower. *Pistil:* germen inferior, conical; style simple, the length of the stamina; stigma thickish, two-lobed. *Pericarp:* capsule oblong, turbinate, two-celled, two-valved. *Seeds:* very many, imbricate. Essential Character. *Corolla:* bell-shaped. *Capsule:* two-celled, two-valved, with the valves gaping outwardly at the sides. *Seeds:* imbricate. ——The species are,

1. Macrocnemum Jamaicense. Corymbs on long axillary stalks; calix without any appendage. A small tree, with a branching smooth trunk; branches long, loose, round, and warted; leaves approximating towards the upper part of the branchlets, petioled, opposite, large, oblong, with a short point, entire, nerved, smooth on both sides; flowers in a sort of panicle; corollas rather large, of a yellowish green. It generally rises to the height of twelve or fourteen feet.—Native of the southern part of the island of Jamaica, on the banks of rivulets.

2. Macrocnemum Coccineum. Racemes with elliptic coloured leaves; leaves lanceolate, elliptic, one to two feet long. This is a tree, with hairy branches; corolla funnel-form.—Found in the island of Trinidad by Von Rohr.

3. Macrocnemum Candidissimum. Corymbs trichotomous, with roundish leaves; leaves ovate. This is a tree, with round, smooth, opposite branches, jointed at top, compressed, dilated under the leaves; capsule oblong.—Found by Von Rohr in the neighbourhood of St. Martha.

4. Macrocnemum Speciosum. Corymbs shorter than the leaves, hairy; calicine bractes roundish ovate, its stalk shorter than the corolla. A beautiful shrub, five feet high.—Native of the Caraccas.

Macrolabium; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth double, outer two-leaved; leaflets opposite, ovate-oblong, fastened to the base of the inner; inner one-leafed, turbinate, short; mouth oblique, five-toothed. *Corolla:* five-petalled, unequal; upper petal very large, upright, clawed, oblong, blunt, concave, waved, inserted into the inner perianth; lower petals four, small, ovate, spreading, fastened to the inner perianth above. *Stamina:* filamenta four, inserted into the inner perianth; one short, barren, under the great petal; three very long, filiform, anther-bearing, fastened below the smaller petals; antheræ four-cornered. *Pistil:* germen pedicelled, ovate; style filiform; stigma blunt. *Pericarp:* legume ovate, compressed, coriaceous, one-celled. *Seed:* single, roundish, compressed. Essential Character. *Calix:* double; outer two-leaved; inner one-leafed. *Petals:* five; upper very large, the four other very small, equal. *Germen:* pedicelled.——The species are,

1. Macrolobium Vouapa. Leaves binate; Legume sharp on one side, and two-winged. This is a branching tree, sixty feet high, with flowers of a pale violate colour at the ends of the branches.—Found in the large forests of Guiana.

2. Macrolobium Simira. Leaves binate; legume rounded on all sides. This tree is much branched, has a thick trunk, and rises to the height of eighty feet. The bark is reddish, thick, and wrinkled.—Native of South America.

3. Macrolobium Outea. Leaves two-paired. This tree, which is very branchy at top, rises to the height of fifty feet, with a smooth grey bark.—Native of the forests of Guiana.

Madder. See *Rubia.*

Madwort. See *Alyssum.*

Magnolia; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* perianth three-leaved; leaflets ovate, concave, petal-shaped, deciduous. *Corolla:* petals nine, oblong, concave, blunt, narrower at the base. *Stamina:* filamenta numerous, short, acuminate, compressed, inserted into the common receptacle of the pistilla below the germina; antheræ linear, fastened on each side to the margin of the filamenta. *Pistil:* germina numerous, ovate-oblong, two-celled, covering a club-shaped receptacle; styles recurved, contorted, very short; stigmas longitudinal of the style, villose. *Pericarp:* strobile ovate, covered with capsules, which are compressed, roundish, scarcely imbricate, clustered, acute, one-celled, two-valved, sessile, opening outwards, permanent. *Seeds:* two or one, roundish, berried, hanging by a thread from the sinus of each scale of the strobile. *Observe.* The germina are two-celled and two-seeded; the ripe capsules one-celled, two-valved. Essential Character. *Calix:* three-leaved. *Petals:* nine. *Capsule:* one-celled, two-valved. *Seeds:* berried, pendulous.——The species are,

1. Magnolia Grandiflora; *Laurel-leaved Tulip Tree.* Leaves perennial, oblong, tomentose underneath; petals obovate. The trunk of this tree is straight, two feet or more in diameter, rising to above seventy or eighty feet, dividing into many branches, which form a large regular head. The flowers are produced at the ends of the branches; they are very large, and composed of eight or ten petals, narrow at their base, but broad, rounded, and a little waved at their extremities; they spread open very wide, six to nine inches, are of a pure white colour, and have an agreeable scent. In its native country it begins to flower in May; the flowers continue a long time, perfuming the woods with their odour during the greatest part of the summer; but in England it seldom begins to flower till the middle or end of June, and does not continue long in beauty.—Native of Florida and Carolina. This, with all the other species, is propagated by seeds, layers, and cuttings of the shoots: if by seeds, they should be procured from the places of their natural growth, which should be put up in sand, and sent over as soon as possible; for if they are kept long out of the ground, they rarely grow. It is a good way to sow them in pots, and plunge them into an old hot-bed of tanner's bark. To increase them by layers, choose the young pliable shoots, giving them a gentle twist, or a slit. It may be done either in spring or autumn. Some may root the first year, but more probably not till the second. Then take them off, plant them in pots, in the early spring, and plunge them in a moderate hot-bed for a month or two, and thus they will make good plants by autumn. Shelter them during winter for a year or two, and then plant them in the full ground. For cuttings, take young shoots of the preceding year; in March or April, plant them in pots up to the rims in a hot-bed; water and shade them occasionally; and when they are rooted, inure them by degrees to the open air.

2. Magnolia Plumieri; *Plumier's Magnolia.* Leaves perennial, ovate-roundish, smooth on both sides.—Native of the island of St. Lucia, Martinico, and Guadaloupe.

3. Magnolia Glauca; *Swamp Magnolia.* Leaves ovate-oblong, glaucous underneath. It grows about fifteen or sixteen feet high. The flowers are produced in May and June, at the extremity of the branches; they are white, and have an agreeable sweet scent; and have only six concave petals: after these are past, the fruit increases to the size of a walnut, with its cover of a conical shape; the seed is about the size of a kidney-bean. In America this tree is known by the names of *White Laurel, Swamp Sassafras,* and *Beaver Tree.* It has the last name, because the root is eaten as a great dainty by beavers, which are caught by means of it.—These trees are natives of the woods of America, and may be discovered by the scent of the blossoms at the distance of three quarters of

a mile, if the wind be favourable; and while they are in flower, it is exceedingly pleasant to travel in the woods, especially in the evening: they retain their flowers three weeks, and even longer. The berries also look very handsome when they are ripe, being of a rich red colour, and hanging in bunches on slender threads. Coughs, and other diseases of the breast, are said to be cured by putting these berries into brandy, and giving a draught of the liquor every morning; which is also reputed to be salutary in comsumptions. A decoction of the bark also, or an infusion of it in brandy, is not only supposed to cure pectoral diseases, but to assuage internal pains and heat, and cure dysenteries. For colds, they commonly boil the branches in water. The wood, which is white and spongy, is used for joiners' planes.—This tree, in our climate, requires a moist loamy soil.

4. Magnolia Obovata; *Purple Magnolia.* Leaves obovate, parallel, nerved, and netted underneath.—Native of Japan.

5. Magnolia Tomentosa. *Slender Woolly Magnolia.* Leaves elliptic, tomentose underneath. This and the preceding species are cultivated by the Japanese for the elegance of their flowers.—Native of Japan.

6. Magnolia Acuminata; *Blue Magnolia.* Leaves ovate-oblong, acuminate. The flowers appear early in spring, they are composed of twelve large bluish-coloured petals; the fruit is about three inches long, somewhat resembling a small cucumber; whence the North Americans call it Cucumber Tree. The wood is of a fine grain, and an orange colour.—Native of North America.

7. Magnolia Tripetala; *Umbrella Magnolia,* or *Umbrella Tree.* Leaves lanceolate; petals nine, the outer ones hanging down. Trunk slender, from sixteen to twenty feet high; the leaves are often from twelve to fifteen inches long, and five or six inches wide, narrowing to a point at each extremity, placed at the ends of the branches in a circular manner, somewhat like an umbrella; and hence the name: the flowers are upright, large, and white: the wood is soft and spongy; and the leaves drop off at the beginning of winter.—Native of North America.

8. Magnolia Macrophylla; *Long-leaved Magnolia.* Branches pithy, fragile; leaves very large, glaucous underneath; petals six, ovate, obtuse. This small stately tree has white flowers, tinged with red at the bottom, and larger than those of the first species.—It grows in the deep forests of Tenassee, and is one of the most ornamental trees America produces, flowering in June and July.

9. Magnolia Cordata. Leaves cordate, subtomentose; petals lanceolate-oblong, acute; flowers yellow.—Found on dry ridges of mountains, in Upper Carolina and Georgia.

10. Magnolia Auriculata; *Ear-leaved Magnolia.* Leaves large, obovate-lanceolate, acute, glaucous underneath, cordated at the base, auriculate; lobes approximate; petals ovate, acute, subunguiculate; flowers yellowish-white, large.—Found in the Alleghany mountains, from the head-waters of the Susquehanna to Carolina. The bark of this species is esteemed a valuable medicine, particularly in intermitting fevers: from which circumstance it is, in some places, known by the name of *Indian Physic.*

11. Magnolia Pyramidata. Leaves rhomboidal-oboval, abruptly acute, subcordate, auriculate; lobes divaricate; petals lanceolate, somewhat acute. Pursh observes, that this tree has been generally confounded with the preceding; from which it not only differs as above, but in habit, being of a more upright pyramidal growth, and the leaves not one-fourth the size of that species.—Native of the western parts of Carolina and Georgia.

Mahernia; a genus of the class Pentandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, bell-shaped, with awl-shaped longer teeth; permanent. *Corolla:* petals five, heart-shaped, oblong, spreading, twice as long as the calix; nectaries five, obcordate, pedicelled, surrounding the germen, shorter than the calix. *Stamina:* filamenta five, capillary, placed on the nectary, united at the base, shorter than the calix; antheræ oblong, acuminate, erect. *Pistil:* germen subpedicelled, obovate, five-angled; styles five, bristle-shaped, erect, the length of the petals; stigmas simple. *Pericarp:* capsule ovate, five-celled, five-valved. *Seeds:* few, kidney-form. *Observe.* It has a very great affinity to Hermannia, but their nectaries cannot be combined in the same character. Essential Character. *Calix:* five-toothed. *Petals:* five. *Nectaries:* five, obcordate, placed under the filamenta. *Capsule:* five-celled.—These may be increased by planting cuttings of the young branches in the summer season, singly, in pots of light mould, watering and plunging them in a hot-bed; to be removed after rooting into the green-house.——The species are,

1. Mahernia Verticillata; *Whorl-leaved Mahernia.* Leaves in whorls, linear. Stem shrubby, diffused, with filiform branches; corolla yellow.—Native of the Cape.

2. Mahernia Pinnata; *Wing-leaved Mahernia.* Leaves three-parted, pinnatifid. Stem shrubby, near three feet high, sending out many delicate branches, covered with a reddish bark; the flowers come out from the side of the branches in small clusters, they are of a lively red when they first open, and hang down like little bells, commonly two together, appearing from June to August and September.—Native of the Cape.

3. Mahernia Incisa; *Cut-leaved Mahernia.* Leaves lanceolate, gashed. In point of size and mode of growth, this beautiful species comes near to the preceding; but differs essentially in the singular hispidity of its stalks, the form of its leaves, and the colour of its flowers. The flowers, when in bud, are of the richest crimson; as they open, they incline to a deep orange, and finally become yellowish.—Native of the Cape.

4. Mahernia Glabrata; *Smooth-leaved Mahernia.* Leaves lanceolate, pinnatifid and toothed; stalks very long, bearing two flowers, which are yellow, fragrant like the Jonquil.—Grows at the Cape.

Mahogany Tree. See *Swietenia.*

Maidenhair. See *Adiantium* and *Asplenium.*

Maithes. See *Anthemis* and *Adonis.*

Malabar Nightshade. See *Basella.*

Malabar Nut. See *Justicia.*

Malachodendrum. See *Stuartia.*

Malachra; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth common mostly five-flowered, three or five leaved, large; leaflets cordate, acute, permanent; chaffs bristle-shaped, set round the proper perianths; perianth proper one-leafed, bell-shaped, small, five-cleft, permanent. *Corolla:* proper, petals five, obovate, entire, fastened at bottom to the tube of the stamina. *Stamina:* filamenta many, conjoined below into a tube, above loose, gaping along the whole surface of the cylinder; antheræ kidney-form. *Pistil:* germen orbicular; style cylindric, ten-cleft; stigmas globular. *Pericarp:* capsule roundish, divisible into five cells, compressed on one side, gibbous on the other. *Seeds:* solitary, roundish, angular. *Observe.* The divisions of the style, and the stigmas, are twice as many as the capsules. Essential Character. *Calix:* common three-leaved, many-flowered, larger. *Arils:* five, one-seeded.——The species are,

1. Malachra Capitata; *Heart-leaved Malachra.* Heads

peduncled, three-leaved, seven-flowered. Stem thick, erect, two feet high, rough, as is the whole plant; flowers aggregate, peduncled; corolla yellow, spreading; petals roundish.—Native of marshy places in the Caribbee islands.

2. Malachra Radiata. Heads peduncled, five-leaved, many-flowered; leaves palmate. Stem tender, round, whitish-green, covered with rufous pungent hairs, as is the whole plant, which is about six feet high; corolla purplish.—Native of marshy places in St. Domingo.

3. Malachra Bracteata. Leaves palmate; heads many-flowered; flowers very small, and bracteated. The whole plant is very hairy.—Native of America.

4. Malachra Fasciata. With serrate three-lobed leaves, the lowest five-lobed; the common involucre three-leaved, and about five-flowered. Stem single, six feet high, and twice the thickness of the thumb; heads of flowers axillary, small, rose-coloured outward, within whitish, with purple streaks.—Native of America.

5. Malachra Alceæifolia. With five-lobed leaves, cordate at the base; the common involucre five-leaved, and about ten-flowered. Stem single, six feet high, upright, an inch thick, covered with glistening pungent hairs; flowers two or three together, rather small, and of a deep yellow.—Native of Martinico.

Malaxis; a genus of the class Gynandria, order Diandria.—Generic Character. *Calix:* spathes none; perianth none. *Corolla:* petals five, three outer, of which two upper, one lower, lanceolate, blunt, spreading; two inner linear, acute, reflex about the germen; nectary in the middle of the corolla, less than the petals, concave, with concave margins, cordate, acuminate behind, bifid in front. *Stamina:* antheræ two, ovate, scarcely pedicelled, inserted into the pitcher of the pistil, at the edge, sitting on two little excavations at the bottom. *Pistil:* germen pedicelled, somewhat cylindric, inferior; style a pitcher in the middle of the nectary, halved, very short, spreading, bearing the stamina on its hinder margin; stigma before the little excavations, near the antheræ. *Pericarp:* capsule pedicelled, oblong, three-keeled, one-celled, opening under the keels, cohering at top and bottom. *Seeds:* extremely minute. Essential Character. *Nectary:* one-leafed, concave, cordate, acuminate backwards, bifid in front, cherishing the genitals in the middle.——The species are,

1. Malaxis Spicata. Scape quadrangular; flowers in spikes. Perennial.—Native of Jamaica.

2. Malaxis Umbelliflora. Scape quinquangular; flowers umbelled.—Native of Jamaica.

3. Malaxis Ophyoglossoides. Leaf solitary, ovate, clasping the stem; stalk with many angles; lip cloven at the extremity.—Native of shady woods in North America.

Male Balsam Apple. See *Momordica.*

Mallow. See *Malva.*

Mallow, Jews'. See *Corchorus.*

Mallow, Marsh. See *Althæa.*

Mallow, Rose. See *Alceæa.*

Mallow, Indian. See *Sida.*

Mallow Tree. See *Lavatera.*

Mallow, Syrian. See *Hibiscus.*

Malope; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth double, outer three-leaved, broader; leaflets cordate, acute, permanent, inner one-leafed, half five-cleft, more erect, permanent. *Corolla:* petals five, obcordate, præmorse, spreading, fastened to the tube of the stamina at the base. *Stamina:* filamenta numerous, at the bottom united into a tube; above, at, and below the apex of the tube, separate and loose; antheræ almost kidney-form. *Pistil:* germina roundish; style simple, the length of the stamina; stigmas many, simple, bristle-shaped. *Pericarp:* capsule roundish, many-celled; cells as many as there are stigmas, conglomerated into a head. *Seeds:* solitary, kidney-form. Essential Character. *Calix:* double, outer three-leaved. *Arils:* glomerated, one-seeded. ——The species are,

1. Malope Malacoides. Leaves ovate-crenate, smooth above. The whole plant much resembles the Mallow; but differs from it, in having the cells collected into a button, somewhat like a Blackberry. The branches spread, and lie flat upon the ground, extending a foot each way; the flowers in shape and colour are like those of the Mallow.—Native of Tuscany and Barbary. It is propagated by seeds sown in the place where they are designed to remain; for it does not bear transplanting well. If these seeds be sown upon a warm border in August, the plants will frequently stand through the winter, and flower early the following season; so that good seeds may be obtained: but those which are sown in the spring rarely ripen the same year in England. In winter they should lie sheltered under a frame. The other species may be propagated nearly in the same manner.

2. Malope Parviflora. Calices simple; leaves subcordate, even; peduncles scarcely longer than the petiole. Root annual; stem very much branched, spreading, red, subvillose, a foot high; flowers axillary; corolla hemispherical.—Native of Peru.

3. Malope Multiflora. Leaves roundish, undivided, notched, villose; stalks three or four together, axillary; flowers small, and white.—Native of Spain.

4. Malope Trifida. Leaves oblong, three-lobed, pointed, toothed, smooth; stalks solitary, axillary.—Found in meadows, both in Spain and Barbary.

Malpighia; a genus of the class Decandria, order Trigynia.—Generic Character. *Calix:* perianth five-leaved, erect, very small, permanent, converging. There are two melliferous glands, oval and gibbous, fastened to the calicine leaflets, on the outside, and at the bottom. *Corolla:* petals five, kidney-form, large, plaited, ciliate, spreading, concave, with long linear claws. *Stamina:* filamenta ten, broadish, awl-shaped, erect, placed in a cylinder, united below, small; antheræ cordate. *Pistil:* germen roundish, very small; styles three, filiform; stigmas blunt. *Pericarp:* berry globular, torulose, large, one-celled. *Seeds:* three, bony, oblong, blunt, angular, with an oblong blunt kernel. Essential Character. *Calix:* five-leaved, with melliferous pores on the outside, at the base. *Petals:* five, roundish, with claws. *Berry:* one-celled, three-seeded.——The species are,

1. Malpighia Glabra. *Smooth-leaved Barbadoes Cherry.* Leaves ovate, quite entire, smooth; peduncles umbelled. This tree grows to the height of fifteen or sixteen feet, erect, divided into very delicate slender branches; flowers in axillary and terminating bunches or umbels, on peduncles half an inch long, and about four flowers on each; petals rose-coloured, or bright purple; fruit red, round, smooth-skinned, the size of a cherry, containing within a reddish, not unpleasant, copious, juicy pulp.—This tree is planted in most gardens of the West Indies, where the fruit is esteemed. This, with all its congeners, are propagated by seeds, which must be sown upon a good hot-bed in the spring; and when the plants are fit to transplant, they must be each put into a separate small pot filled with rich earth, and plunged into a hot-bed of tanner's bark; where they must be treated in the same manner as other tender plants from the same country. For the first two winters it will be proper to keep them in the bark-bed in the stove; but afterwards they may be

placed upon stands in the dry-stove in winter, where they may be kept in a temperate warmth; in which they will thrive much better than in a greater heat. They must be watered two or three times a week, while placed in the dry-stove; but it must not be given to them in large quantities.

2. Malpighia Punicifolia; *Pomegranate-leaved Barbadoes Cherry.* Leaves ovate, quite entire, smooth; peduncles one-flowered. This rises with a shrubby stalk, ten or twelve feet high, dividing into several slender spreading branches, covered with a light brown bark; corolla pale rose-coloured. —Native of the West Indies.

3. Malpighia Nitida; *Shining-leaved Barbadoes Cherry.* Leaves lanceolate, quite entire, smooth; spikes lateral. This is a shrub, six feet high; stem upright, round, even; branches decussated, upright, round, covered with a shining bark; flowers peduncled, yellow.—Native of the West Indies.

4. Malpighia Faginea. Leaves oblong-ovate, entire, silky, shining underneath; peduncles three-parted, umbelled.—Native of the West Indies.

5. Malpighia Lucida. Leaves obovate, wedge-form, quite entire, nerveless, shining; peduncles terminating, many-flowered.—Native of the West Indies.

6. Malpighia Urens; *Stinging Barbadoes Cherry.* Leaves oblong-ovate, with rigid decumbent bristles underneath; peduncles one-flowered, aggregate. This shrub rises with a strong upright stem about three feet high, covered with a brown bark, sending out several side-branches, which grow erect.—Native of the West India Islands.

7. Malpighia Angustifolia; *Narrow-leaved Barbadoes Cherry.* Leaves linear-lanceolate, with rigid decumbent bristles on both sides; peduncles umbelled. Stalk shrubby, seven or eight feet high.—Native of the West Indies.

8. Malpighia Crassifolia; *Thick-leaved Barbadoes Cherry.* Leaves ovate, quite entire, tomentose underneath; racemes terminating.—Native of the West India Islands and Guiana.

9. Malpighia Coriacea. Leaves ovate, acute, entire, smooth on both sides; racemes terminating, spiked. This tree rises frequently to the height of thirty or forty feet, or more.—Native of Jamaica, where it is common on the lower hills of Liguanea. Brown calls it the Locust Berry Tree.

10. Malpighia Canescens; *Downy-leaved Barbadoes Cherry.* Leaves oblong, blunt, pubescent; racemes axillary, compound.—Native of the West Indies.

11. Malpighia Verbascifolia; *Mullein-leaved Barbadoes Cherry.* Leaves lanceolate-ovate, tomentose, quite entire; racemes terminating.—Native of South America.

12. Malpighia Aquifolia; *Holly-leaved Barbadoes Cherry.* Leaves lanceolate, tooth-spiny, hispid underneath.—Found in the isle of Cuba.

13. Malpighia Coccigera. Leaves subovate, tooth-spiny. Stalk thick and woody, two or three feet high.—Native of the West Indies.

14. Malpighia Martinicensis. Leaves ovate, with decumbent rigid bristles underneath.—A small tree; found by Jacquin in Martinico.

15. Malpighia Diphylla. Leaves oval, smooth; racemes terminating. An upright shrub, eight feet high: flowers yellow; berries red.—Found near Carthagena.

16. Malpighia Odorata. Leaves ovate, emarginate, tomentose on both sides; racemes axillary. It is an upright shrub, eight feet high; flowers sweet, smelling like those of yellow Lupine; petals yellow; berries orange-coloured.—Found near Carthagena.

17. Malpighia Grandifolia. Leaves lanceolate-oblong; racemes corymbed, axillary. This is a small tree, ten feet high, upright.—Native of Martinico.

18. Malpighia Altissima. Leaves lanceolate, ferruginous underneath, smooth above, quite entire; racemes terminating, upright. This tree is thirty feet high, or more, with an upright trunk, and a pyramidal elegant head; flowers yellow, sweet, in long racemes, not unlike those of the Horse Chestnut. Berries yellow, acid, but not unpleasant. The wood is white.—It is common in Martinico, where the natives call it *Bois Tan*, the bark being fit for tanning leather.

Malva; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth double; outer three-leaved, narrower; leaflets cordate, acute, permanent; inner one-leafed, half five-cleft, larger, broader, permanent. *Corolla:* petals five, obcordate, præmorse, flat, fixed to the tube of the stamina at the base. *Stamina:* filamenta numerous, united below into a tube, seceding, and loose at the top and surface of it; antheræ kidney-form. *Pistil:* germen orbicular; style cylindric, short; stigmas very many, bristly, the length of the style. *Pericarp:* capsule roundish, composed of very many cells, (as many as there are stigmas,) two-valved, placed in a whorl about a columnar receptacle, finally falling. *Seeds:* solitary, very seldom two or three, kidney-form. Essential Character. *Calix:* double: outer three-leaved. *Capsule:* many, united in a depressed whorl, one-celled, one-seeded.—Sow the seeds of the hardy sorts at the end of March, upon a bed of fresh light earth; and when the plants are three or four inches high, transplant them where they are to continue, allowing them sufficient space. They appear best when intermixed with other flowers of the same growth. The seeds may also be sown in August, on a dry soil, and these plants will grow larger and flower sooner than those which are sown in the spring: or, if the seeds be permitted to scatter, they will come up, and thrive equally with those which are sown.—The seeds of those species which come from hot countries, must be sown upon a hot-bed in the spring. When the plants are fit to remove, plant each in a small pot filled with light fresh earth, and plunge them into a new hot-bed, shading them until they have taken fresh root; then admit free air to them in proportion to the warmth of the season, and at the end of June they may be placed in the open air in a sheltered situation, where they will flower, and produce ripe seeds. Some species require the protection of the bark-stove.——The species are,

* *With undivided Leaves.*

1. Malva Spicata; *Spiked Mallow.* Leaves cordate, crenate, tomentose; spikes oblong, rough-haired. Stem pale green, two or three feet high, branched; flowers orange-coloured, in a thick spike, with very hirsute calyxes. It flowers in September and October.—Native of Jamaica.

2. Malva Tomentosa; *Downy-leaved Mallow.* Leaves cordate, crenate, tomentose; flowers lateral, heaped; stem shrubby; petals short; stamina five; styles many.—Native of the East Indies and Cochin-china.

3. Malva Gangetica; *Indian Mallow.* Leaves cordate, obtuse, rugged; flowers sessile, glomerate; arils ten, awnless, crenulate. Flowers yellow.—Native of India.

4. Malva Coromandeliana; *Coromandel Mallow.* Leaves oblong or cordate, serrate; peduncles axillary; flowers glomerate; arils cusped; stem a foot high, round, hispid.—Common in Jamaica, among grass.

5. Malva Scoparia; *Small Yellow-flowered Upright Mallow.* Leaves ovate, crenate-serrate; flowers axillary, clustered; stems shrubby; branches rod-like. This is a shrub, a fathom in height; flowers yellow, marked with red spots. The Spaniards of South America call it *Escoba Cimarrona*, or *Wild Broom;* they make common besoms of the branches.—Native of Peru.

6. Malva Angustifolia; *Narrow-leaved Mallow.* Leaves lanceolate; flowers axillary, in pairs; peduncles shorter than the petiole; outer calix bristle-shaped, deciduous. Stem suffruticose, round, branched, three feet high; corolla pale violet. It flowers in August.—Native of Mexico.

7. Malva Americana; *American Mallow.* Leaves cordate, crenate; lateral flowers solitary; terminating flowers in spikes. Root annual; stem a foot high, stiff, round, somewhat hairy; branches few, short, upright, from the lower axils; corolla yellow.—Native of North America.

** *With angular Leaves.*

8. Malva Peruviana; *Peruvian Mallow.* Stem upright, herbaceous; leaves palmate; spikes directed one way, axillary; seeds toothletted. Stem from two to three feet high, with hairs thinly scattered over it, usually in pairs; leaves seven-lobed, sharply serrate; corollas small, purple.—Native of Peru.

9. Malva Limensis; *Blue-flowered Mallow.* Stem upright, herbaceous; leaves lobed; spikes directed one way, axillary; seeds even. Flowers blue, appearing in July. Annual.—Native of Peru, about Lima.

10. Malva Bryonifolia; *Bryony-leaved Mallow.* Stem shrubby, tomentose; leaves pinnate, rugged; peduncles many-flowered. Miller describes it as having a shrubby woolly stalk, four or five feet high, branched on every side, with woolly rough leaves; peduncles axillary, supporting four or five flowers; bright purple, shaped like those of the Common Mallow: they appear in July, and ripen seed in autumn. This plant is handsomely echinated on the disk of the leaf. It seldom continues more than two or three years.—Native of Spain.

11. Malva Lactea; *Panicled Mallow.* Stem shrubby; leaves acute, cordate, villose; petals obcordate, shorter than the calix; peduncles panicled.—Native place unknown.

12. Malva Vitifolia; *Vine-leaved Mallow.* Stem upright, branched; leaves five-lobed, crenate, villose; axils many-flowered. Stem six feet high, round; corolla white, a little larger than the calix.—Native of Mexico.

13. Malva Umbellata; *Umbelled Mallow.* Stem shrubby: leaves cordate, five-lobed; flowers umbelled. Stem shrubby, round, two feet high, tomentose; corolla bell-shaped, twice as large as the calix, very deeply divided into five rounded striated segments, of a fiery violet colour, with the base by which they are united white; style purple rose-coloured, hollow.—Native of Mexico.

14. Malva Capensis; *Gooseberry-leaved* or *Cape Mallow.* Leaves cordate, five-lobed; stem arborescent. This rises with a woody stalk about ten feet high, sending out branches the whole length; and covered with hairs; the flowers come out from the side of the branches, upon peduncles an inch long; they are of a deep red colour, shaped like those of the Common Mallow, but smaller: it flowers great part of the year. There are several varieties.—Native of the Cape.

15. Malva Virgata. Leaves narrowed at the base, multiform, parted; divisions gash-crenate; peduncles one-flowered; stem frutescent. Trunk very small, branching almost immediately from the root; corolla purple, streaked with deep purple or red spots at the base.

16. Malva Balsamica. Leaves subcordate, sublobate, unequally serrate, glutinous; stem shrubby. A shrub about four feet high; petals pale rose-coloured.—Native country unknown; probably the Cape.

17. Malva Abutiloides. Leaves deeply lobed and sinuated; stems shrubby, hoary; corolla white.—Native of the Cape.

18. Malva Caroliniana; *Creeping Mallow.* Stem creeping; leaves multifid. Root annual. Stem eighteen inches or longer, round, putting out roots at the lower joints, hairy; leaves villose, soft; flowers axillary and terminating, on almost upright peduncles, from an inch to an inch and half in length, small, the colour of Burgundy wine; the claws of a darker red.—Native of Carolina.

19. Malva Parviflora. Stem spreading; flowers axillary, sessile, glomerate; calices smooth, spreading. Annual.—Native of Barbary.

20. Malva Nicæensis. Stem decumbent; calices glomerate, both hairy; leaves five-lobed. Root annual; stems decumbent, scarcely branched; corolla pale red, a little larger than the calix; petals emarginate.—Found in the county of Nice.

21. Malva Pusilla; *Small Mallow.* Stem declining; leaves roundish, heart-shaped, slightly five-lobed; flowers peduncled, generally in pairs; petals the length of the calix. Root annual, or perhaps biennial.—Observed at Hithe in Kent, and in Pembrokeshire. It differs from the other Mallows, in having the seeds wrinkled.

22. Malva Rotundifolia; *Round-leaved* or *Dwarf Mallow.* Stem prostrate; leaves cordate-orbiculate, obsoletely five-lobed; fruiting, peduncles declining. Root annual, whitish, striking deep; stems several, branched; corolla white, with purple veins, and purple towards the top.—Native of most parts of Europe, on dry banks, by way-sides, under walls, and other fences; flowering from June to September.

23. Malva Sherardiana. Stems prostrate; leaves orbicular, plaited, tomentose, crenate; peduncles solitary, one-flowered, bowed. Perennial.—Native of Bithynia.

24. Malva Sylvestris; *Common Mallow.* Stem upright, herbaceous; leaves five-lobed, acute; peduncles and petioles hairy. Root perennial, whitish, the thickness of a finger, striking deeply, thinly furnished with large fibres, not creeping, sweetish, and viscid; leaves five-lobed, hairy on both sides; corolla bluish-purple.—Common in most parts of Europe, by hedges, roads, and in waste places, flowering from June to September. Cattle do not appear to be fond of this plant; every part of which abounds with a mild mucilage. The boiled root is much used as an emollient cataplasm; and an infusion of it is generally prescribed in all cases wherein mild mucilaginous substances are useful; as in disorders of the urinary passages, and in coughs and hoarsenesses. The use of it, however, has been much superseded by Althæa, or Marsh-mallow, which possesses its valuable qualities in a superior degree. The leaves also are not unfrequently used in fomentations and clysters. Woodville says, that the roots of Malva are useless, whilst those of Althæa are of more efficacy than any other part of the plant. It is well known that this plant was an esculent vegetable among the Romans. Prosper Alpinus informs us, that a plant of the mallow kind is eaten by the Egyptians; and the Chinese use some sort of Mallow in their food.

25. Malva Orientalis; *Oriental Mallow.* Stem upright, herbaceous; leaves lobed, blunt, crenate. The uprightness of the plant, with the colour of the flowers, immediately distinguish this from the Common Mallow, which in many respects it much resembles.—Found in the Levant.

26. Malva Mauritiana; *Ivy-leaved Mallow.* Stem upright, herbaceous; leaves five-lobed, blunt; peduncles and petioles smoothish. Annual.—Native of the south of Europe.

27. Malva Fragrans. *Sweet Mallow.* Stem upright, frutescent; leaves roundish-cordate, half five-lobed.—Native place uncertain. The whole plant has a strong aromatic smell.

28. Malva Hispanica; *Spanish Mallow.* Stem upright; leaves semiorbiculate, crenate; outer calix two-leaved. Corolla flesh-coloured.—Native of Spain.

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MAGNOLIA GRANDIFLORA —
Laurel-leaved Magnolia.

P. 74.

MALVA SYLVESTRIS — *Common Mallow.*

W. Mayflower sc.

Published by Henry Fisher, Caxton, London, 1824.

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29. Malva Verticillata; *Whorl-flowered Mallow.* Stem upright; leaves angular; flowers axillary, glomerate, sessile; calices rugged. Root annual; flowers whitish-red, small, on one-flowered pedunceles. It flowers in June and July.—Native of China and Cochin-china.

30. Malva Crispa; *Curled Mallow.* Stem upright; leaves angular, curled; flowers axillary, glomerate. Annual; stem four or five feet high.—Native of Syria.

31. Malva Alcea; *Vervain Mallow.* Stem upright; leaves many-parted, somewhat rugged. Root long, branched, perennial; corolla bright purple.—Native of Europe.

32. Malva Moschata; *Musk Mallow.* Stem upright; root-leaves kidney form, gashed; stem-leaves five-parted, pinnate-multifid. Stem round, much branched, slightly hairy; flowers crowded on the top of the stem and branches on short pedunceles, and single ones from the axils of the upper leaves; petals heart-shaped, divided nearly to the base, pale red or flesh-coloured, with deeper veins. The flowers have an ambrosial or musky scent, which, however, is not always to be perceived.—Native of many parts of Europe. In England it is by no means uncommon, particularly in the midland counties, in Hertfordshire, Huntingdonshire, Derbyshire, and in the north. It is sometimes observed in Norfolk, Suffolk, and Cambridgeshire; on Cullum heath, South Leigh, and between Witney and Burford, in Oxfordshire. Mr. Curtis mentions its growing plentifully near Coomb wood. It has also been found near Balham, in Surrey. Mr. Goodyer found it with white flowers in a close called Aldercrofts, near Maple-Durham, in Hampshire.

33. Malva Tournefortiana. Stem decumbent; root-leaves five-parted, three-lobed, linear; pedunceles longer than the stem-leaf; corolla blue.—Native of Provence and Spain, on the sea-coast.

34. Malva Ægyptia; *Palmated Mallow.* Stem upright; leaves palmate, toothed; corollas smaller than the calix.—Native of Egypt.

Mammea; a genus of the class Polyandria, order Monogynia.—Generic Character. *Hermaphrodite. Calix:* perianth one-leafed, two-parted; divisions roundish, concave, coriaceous, coloured, spreading very much, deciduous. *Corolla:* petals four, roundish, concave, spreading very much, subcoriaceous, longer than the calix. *Stamina:* filamenta numerous, bristle-shaped, erect, very short, inserted into the receptacle, ending in oblong, blunt, erect antheræ. *Pistil:* germen roundish, depressed; style cylindric, erect, longer than the stamina, permanent; stigma capitate, convex. *Pericarp:* berry roundish, fleshy, very large, acuminate with part of the style, with a coriaceous rind, one-celled. *Seeds:* four, subovate, rugged, distinct from the flesh. *Male:* on the same, or a different tree. *Calix, Corolla,* and *Stamina:* as in the hermaphrodite. Essential Character. *Calix:* one-leafed, two-parted. *Corolla:* four-petalled. *Berry:* very large, four-seeded.——The only known species is,

1. Mammea Americana; *American Mammee.* Leaves oval or obovate, quite entire, blunt; flowers sweet, white, an inch and half in diameter; fruit roundish, or obsoletely three or four cornered. It is a tall, upright, handsome tree, with a thick, spreading, elegant head; growing to the height of sixty or seventy feet in the West Indies. The fruit is covered with a double rind; the outer one leathery, a line in thickness, tough, brownish-yellow, divided by incisures longitudinally decussated; the inner thin, yellow, adhering strongly to the flesh, which is firm, bright yellow, has a pleasant singular taste, and a sweet aromatic smell; but the skin and seeds are very bitter and resinous: it is eaten raw alone, or cut in slices with wine and sugar, or preserved in sugar. In Martinico they distil the flowers with spirit, and make a liquor which they call *Eau Creole.* The English and Spaniards call the fruit *Mamei,* or *Mammee;* and the French, *Abricot-sauvage,* from the yellowness of the pulp, like that of the Apricot.—To propagate this tree, set the stones or seeds as fresh as possible from the West Indies, in pots filled with fresh light earth, and plunge them into a hot-bed of tanner's bark; observing to water the earth whenever it appears dry. In about a month or six weeks the plants will appear above ground: after which they must be frequently refreshed with water; and in hot weather the glasses of the hot-bed should be raised, to let in fresh air. In two months the roots of the plants will have filled the pots, when you should provide some pots of a larger size; into which transplant them, taking care to preserve as much earth to their roots as possible, filling up the pots with light earth, and replunging them into the bark-bed; observing to water and shade them until they have taken root: after which they should be constantly refreshed with water, as you find they want it, and must have air in hot weather. In this bed they may remain till Michaelmas, when they must be removed into the bark-stove, and constantly kept there, observing to refresh them with water but sparingly at this season; as also to clean their leaves from the filth they are apt to contract in the stove. The spring following they should be shifted into fresh earth, and, if they require it, into larger pots: but by no means over-pot them; for they do not send forth many roots, and will not thrive when the pots are too large. They must be constantly kept in the bark-stove, and treated as directed for the Coffee Tree. If, when the stones of the fruit are brought over, they are put into the tan-bed, under the bottom of any of the pots, they will sprout sooner than those which are planted in the earth.

Manchineel. See *Hippomane.*

Mandrake. See *Atropa.*

Manettia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth eight-leaved; leaflets linear, concave, hirsute, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindric, longer than the calix, scored on the inside with four lines; border four-parted; divisions shorter than the tube, ovate, obtuse, bearded within; nectary a rim surrounding the receptacle, quite entire, concave. *Stamina:* filamenta four, filiform, very small, inserted into the throat; antheræ linear, incumbent, two-celled. *Pistil:* germen inferior, turbinate, compressed; style filiform, declining, the length of the tube; stigma bifid, thickish, blunt. *Pericarp:* capsule turbinate, compressed, grooved on both sides, one-celled, two-valved, or separable as it were into two capsules. *Seeds:* few, flat, winged, orbiculate with a central seedlet, imbricate at a pulpy oblong pillar. Essential Character. *Calix:* eight-leaved. *Corolla:* four-cleft. *Capsule:* inferior, two-valved, one-celled. *Seeds:* imbricate, orbicular, with a central seedlet.——The species are,

1. Manettia Reclinata. Leaves ovate, acute, pubescent; stem reclining, herbaceous. Root annual; flowers white.—Native of Mexico.

2. Manettia Lygistum. Leaves ovate, acute, veined; stem twining, suffrutescent. This weakly shrub rises to the height of about seven feet.—Native of Jamaica.

3. Manettia Lanceolata. Leaves lanceolate; flowers five-stamined. Stem shrubby; pedunceles terminating, often in threes.—Native of the West Indies.

4. Manettia Coccinea. Leaves ovate, acuminate; clusters many-flowered; stem twining, shrubby. Root perennial; tube of the corolla white, marked with red dots; limb of a scarlet colour above, downy; mouth closed with yellow hairs.—Native of Guiana.

Mangifera; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted; divisions lanceolate. *Corolla:* petals five, lanceolate, longer than the calix. *Stamina:* filamenta five, awl-shaped, spreading, the length of the corolla; antheræ subcordate. *Pistil:* germen roundish; style filiform, the length of the calix; stigma simple. *Pericarp:* drupe kidney-form, oblong, gibbous, compressed. *Seed:* kernel oblong, compressed, lanuginose. Essential Character. *Corolla:* five-petalled. *Drupe:* kidney-form.——The species are,

1. Mangifera Indica; *Mango Tree.* Leaves simple; flowers five-stamined. The wood of this large spreading tree is brown, brittle, and used only for indifferent works. The bark becomes rugged by age. The leaves are seven or eight inches long, and two or more broad, of a shining green, and a sweet resinous smell, on short petioles, growing in bunches at the extremity of the branches. The flowers are produced in loose bunches at the end of the branches. The fruit, when fully ripe, is yellow and reddish, replete with a fine agreeable juice: some are full of fibres, and the juice runs out of these on cutting, or with a little handling; but those which have few or no fibres are much the finest; they cut like an apple, but are more juicy; and some are as big as a large man's fist. It is a very wholesome fruit, and, excepting the finest pine-apples, is the best fruit in India; where gentlemen eat little other fruit in the hot months. When no wine is drank with it, the Mango is apt to throw out troublesome boils, especially with new comers; but even these boils are conducive to health. In Europe we have only the unripe fruit brought over in pickle. Loureiro remarks, that there are many varieties, differing chiefly in the figure, size, colour, and taste of the fruit; as apples and pears do in Europe.—Native of India, the Brazils, Cochin-china, Pegu, &c. The readiest method to obtain plants of Mango in Europe is, to set a quantity of nuts in a tub of earth, in the country where they grow naturally; and when the plants are grown a foot high, to ship them, placing a covering over them, to defend them from the spray of the sea, being very careful not to water them too much in the passage. When the ship arrives in a cold climate, they should be screened from the cold. It will not thrive in the tan-pit: set the plants therefore in pots filled with light kitchen-garden earth, and place them in a dry-stove; where, in warm weather, they should have fresh air daily; and in winter the air should be kept up to temperate, as marked on the thermometer. It may afterwards be propagated from cuttings.

2. Mangifera Pinnata; *Wing-leaved Mango Tree.* Leaves pinnate; flowers ten-stamined.—Native of the East Indies.

3. Mangifera Fœtida; *Stinking Mango Tree.* Racemes elongated; petals entire and reflex; drupe cordate, pubescent. This large tree has ascending branches, and a rugged bark. The wood, though not very good, is used for floors; and lasts very well, if it be soaked a considerable time in muddy water. —Native of the East Indies and Cochin-china.

Mango Tree. See *Mangifera.*

Manisuris; a genus of the class Polygamia, order Monœcia.—Generic Character. *Hermaphrodite flowers:* in the adverse side of the flexuose jointed spike, imbricate, alternate, each immersed in each joint, which is excavated on one side. *Calix:* glume one-flowered, two-valved; outer valve larger, coriaceous, roundish, rugged in the middle, emarginate or entire at the top and sides; inner smaller, broad lanceolate, membranaceous, pressed close to the outer. *Corolla:* glume two-valved, membranaceous, thin, diaphanous, smaller than the calix, included; the outer with its margins embracing the inner, which is smaller; nectary a membranous scale. *Stamina:* filamenta three, filiform, standing out; antheræ oblong, incumbent. *Pistil:* germen ovate; styles two, short, filiform; stigmas oblong, bearded, spreading, standing out on both sides. *Pericarp:* none. *Calix:* cherishing the seed; *Seed:* single, ovate. *Male Flowers:* marginal, alternate, in the back of the spike on each side. *Calix:* glume one-flowered, roundish, two-valved; valves parallel, ovate-lanceolate, blunt, striated, leathery, augmented by a membrane, almost equal. *Corolla:* glume two-valved, membranaceous, thin, almost the size of the calix; outer valve ovate, blunt, convolute; inner lanceolate, plaited, scarcely longer; nectary a membranous scale. *Stamina:* filamenta three, very short, or none; antheræ as in the hermaphrodites. Essential Character. *Hermaphrodite Calix:* glume two-valved, one-flowered; outer valve emarginate at the top and sides. *Corolla:* less than the calix. *Stamina:* three. *Style:* bifid. *Male,* as in the hermaphrodites, but with the flowers in the lower side of the same spike, standing out more.——The species are,

1. Manisuris Myuris; *Mousetail Scaly Grass.* Spikes lateral; outer valves flat, ovate-emarginate at the top and sides; culm ascending.—Native of the East Indies.

2. Manisuris Granularis; *Granulated Scaly Grass.* Spikes lateral; outer valves orbicular, callous, dotted; sheaths hairy; culm erect.—Native of Jamaica.

Manna Ash. See *Fraxinus Rotundifolia.*

Manulea; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth five-parted; leaflets linear, erect, equal, permanent. *Corolla:* one-petalled, irregular; tube cylindric, with the throat rather wider; border five-parted, awl-shaped, spreading; the four upper divisions more connected at the base, the lowest reflex. *Stamina:* filamenta four, very short; antheræ, the two upper in the throat, the two lower somewhat oblong, within the tube. *Pistil:* germen superior, roundish; style filiform, the length of the lower stamina; stigma simple. *Pericarp:* capsule ovate, the length of the calix, two-celled, two-valved; the valves, when ripe, semibifid; partition doubled, by the inflex margins of the valves. *Seeds:* very many, small; receptacle oblong, compressed, in the axis of the capsule. Essential Character. *Calix:* five-parted. *Corolla:* with a five-parted, awl-shaped border; the four upper segments more connected. *Capsule:* two-celled, many-seeded.——The species are,

1. Manulea Cheiranthus. Leaves naked; stems almost leafless; pedicels alternate, one-flowered. An annual shrub: corollas deep yellow.—Native of the Cape.

2. Manulea Tomentosa. Leaves tomentose; stems leafy; peduncles many-flowered. Root biennial; stem eighteen inches high, woolly. The variety of pleasant colours so conspicuous in the flowers, renders this a very desirable plant; the flowers are in a long thyrse, first greenish-yellow, finally a deep orange.—Native of the Cape.

3. Manulea Microphylla. Leaves ovate, in bundles, smooth, entire.—Native of the Cape.

4. Manulea Integrifolia. Leaves ovate, scattered, smooth, entire.—Native of the Cape.

5. Manulea Heterophylla. Leaves linear, scattered, villose, entire, or toothed.—Native of the Cape.

6. Manulea Cœrulea. Leaves linear, opposite, tomentose, toothed; flowers racemed.—Native of the Cape.

7. Manulea Cuneifolia. Leaves elliptically ovate, smooth, toothed; spikes oblong.—Native of the Cape.

8. Manulea Capillaris. Stem-leaves obovate, smooth, toothed; of the branches, linear; spikes ovate.—Native of the Cape.

9. Manulea Plantaginea. Leaves ovate, somewhat toothed,

or entire, smooth; heads ovate; branches diffused.—Native of the Cape.

10. Manulea Capitata. Leaves ovate, serrate, villose; heads globular; branches diffused.—Native of the Cape.

11. Manulea Antirrhinoides. Leaves ovate, toothed, smooth; flowers alternate.—Native of the Cape.

12. Manulea Thyrsiflora. Leaves obovate, tomentose, toothed; corymb terminating, elongated, compound. Stem somewhat shrubby.—Native of the Cape.

13. Manulea Corymbosa. Leaves oblong, toothed, smooth; corymb fastigiate.—Native of the Cape.

14. Manulea Altissima. Leaves lanceolate, somewhat toothed, villose; spike ovate.—Native of the Cape.

15. Manulea Rubra. Leaves lanceolate, villose, serrate; flowers racemed, remote.—Native of the Cape.

16. Manulea Argentea. Leaves obovate, wedge-form, serrate, silver-dotted; flowers axillary.—Native of the Cape.

17. Manulea Pinnatifida. Leaves ovate, gash-pinnatifid; pinnas toothed.—Native of the Cape.

18. Manulea Hirta. Rough-haired; leaves obovate; spikes very long.—Native of the Cape.

Manure. It is a fundamental mistake, to suppose, that tillage may be substituted in the place of manure. Without tillage, indeed, manures will be of little avail: but although good tillage, by separating the soil, may bring a greater number of nutritious particles within the reach of the crop, yet the soil cannot possibly continue to be so completely divided, as it is by the fermentation excited by dung and other manures; which are found to enrich the best pulverized soil again and again, after it is exhausted by crops, and therefore promote vegetation, by increasing the quantity of vegetable food. Some manures lose part of their strength, by long exposure to the air. Thus, after dung is sufficiently fermented, the longer it lies, the less is its value. Cow-dung dried on the pasture, gathered and laid upon other land, has scarcely any effect; whereas the same quantity carried from the cow-house, or collected by folding the cattle, enriches the land. Other manures, on the contrary, operate sooner, and with greater violence, the longer they are exposed to the air before they are used. Lime and marls are of this kind. They are observed to have a strong power of attracting certain qualities from the atmosphere; and operate, by communicating to the soil with which they are mixed, a power of attracting vegetable food from the air. Again, some manures exhaust land of its vegetable food, and do not restore it again when immediately applied; which is thought to be the case with lime. Land thoroughly limed, after having carried many very good crops, seems to be exhausted, and reduced to a worse condition than before. When in this case lime has been applied a second time, its effects have been found to be far inferior to what they were when first applied. This manure, therefore, seems to operate by dissolving the vegetable food which it meets with in the soil, and fitting it for entering the roots of plants. It should however be kept in mind, that exhaustion of land by lime is owing to bad management, and unmerciful forcing of it with continued white crops. It is not certain that land will not bear a second liming; but it is certain, that the effects of the lime may be long kept up, by the proper application of dung and other oily manures; and there have been instances of the effects of lime continuing forty, fifty, or even a hundred years. All kinds of manures certainly contribute to open the soil. Any one may be convinced of this, who will take the trouble to compare a piece of land on which dung or any other manure has been laid, with a piece contiguous that has not been manured: he will find the former much softer, much more free and open, that the latter. It must be allowed, therefore, that all manures operate by enlarging the vegetable pasture. They are applied either to supply the defective ingredients of a soil, to improve its texture, or to correct its vices.—For *Clayey Soils*, the best manure is marl; and that which is most calcareous should be preferred. These soils are defective both in constitution and texture; they want the calcareous ingredient and coarse sand. Calcareous marl supplies the first chiefly; limestone gravel will supply both. A mixture of marl and dung is still more advantageous, because the dung supplies the carbonaceous ingredient: but the same quantity of marl must be used, as if no dung had been applied; or else the operation must be more frequently repeated. If marl cannot be had, a mixture of coarse sand, and lime perfectly effete or extinguished, or chalk, will answer the same purpose, as it will supply the defective ingredient, and open the texture of the clay; so also sand alone, or chalk, or powdered limestone, may answer, though less advantageously. Lime alone seems less proper, as it is apt to cake, and does not sufficiently open the soil. Where these manures cannot be had, coal-ashes, chips of wood, burned clay, brick-dust, gravel, or even pebbles, are useful: for all these improve the texture; and the former supply also the carbonaceous ingredients. Nothing is perhaps equal to good stable and fold-yard dung, for strong tillage land; because it opens this heavy soil, at the same time that it supplies the richest nutriment. But dung is a proper ingredient in the appropriated manures of all sorts of soils, as it supplies the carbonaceous principle.—*Clayey Loam*, is defective, either in the calcareous ingredients, or in the sandy, or in both: if in the first, the proper manure is chalk; if in the second, sand; if in both, siliceous marl, or limestone gravel, or effete lime and sand.—*Chalky Soil*, wants both the clayey, and the stony, sandy, or gravelly ingredients: the best manure for it, therefore, is clayey loam, or sandy loam: but when the chalk is so hard, as to keep of itself the soil sufficiently open, then clay is the best manure; for in such cases the coarse sand or gravelly ingredients of loams are of no use. Some indeed think that pebbles in a field serve to preserve or communicate heat: this use however is not sufficiently ascertained: they detain moisture; and thus on chalk-lands a complete covering of great black flints insures a tolerable crop in a dry season.—*Chalky Loam.* The best manure for this soil is clay, or clay marl; because it is principally defective in the clayey ingredients. Light limestone soils, not differing essentially from these, require the same manure.—*Sands.* The best manure for these is calcareous marl, for they want both clay and calx; and this marl supplies both: the next best is clay marl; and next to these, clay mixed with lime, or calcareous or clayey loams. Lime or chalk are less proper, because they do not give sufficient coherence to the soil: however, when mixed with earth or dung, these answer well; because they form a sort of marl, or compound, comprehending the defective ingredients.—*Sandy Loams*, are defective chiefly in the calcareous ingredient, and in some degree also in the argillaceous: their texture also is imperfect, as they abound both in fine and coarse sand. Chalk or lime would supply the first defect, but leave the texture unamended. Calcareous or argillaceous marls are most proper. Clay, after land has been chalked, answers well, because it remedies the texture.—*Gravelly Loams*, are benefited by the application of marl, whether argillaceous or calcareous. If the gravel be calcareous, clay may be employed. A mixture of effete lime and clay should answer in all cases.—*Ferruginous Loam*, or *Till*, and *Vitriolic Soil*, necessarily require the calcareous ingredient to neutralize their peccant acid: hence chalk, limestone, gravel, and

calcareous marl, are most advantageously applied to them.—*Bogs*, or *Boggy Soils*, must be first drained; and then the nature of the soil being explored, an appropriate manure must be applied. In general they should be burned, and then covered with limestone, gravel, or lime mixed with coarse sand or gravel, because they are usually of a clayey nature; if they are more sandy, lime may answer well, or calcareous marl. If their upper parts contain a sufficiency of the carbonaceous principle, as it often happens, they need not be burned. For all moorish and cold soils, gravel, road dirt, small stones, coal ashes, soaper's ashes, hog-dung, &c. are good. But in cold wet lands, no manure can be effectual without draining.—*Heathy Soils*, should first be burned, to destroy the heath, and increase the carbonaceous principle. Lime also will destroy heath. Limestone gravel is the fittest manure, when the soil is clayey; lime, when it is gravelly. Gypsum also answers remarkably well when the soil is dry. —Manure is usually applied in three different ways. The first and most common is that of ploughing it in, and thus mixing it with the whole soil. This is the best system, where it is necessary to enrich the field for a succession of exhausting crops; and also in strong heavy lands, which require to have their parts separated as much as possible; which effect is produced by nothing better than by ploughing in long dung or green crops. The second is spreading or scattering the manure upon young crops, which is called top-dressing or hand-dressing. This mode is confined to particular substances, as soot, rape cake, pigeon's dung, ashes, &c. and has been found to answer, especially with crops which tiller, as wheat and barley. Even dung well rotted, and made into a compost with earth, lime, or other active substances, may be thus employed, and being applied on the surface, and at a season when the crop stands most in need of it, a much less quantity of manure will be sufficient; but then it will be of little or no use to succeeding crops, and the expense of preparing it will be greater. When crops are sickly or backward in the spring, top-dressings are certainly of great use, except the season should prove uncommonly dry. The third way of applying manure, is laying it into drills, and sowing the crop upon it. This is used only for particular crops, as potatoes, turnips, &c. which thus receive the whole benefit of the manure in all stages of their growth. —*Dung*, is the most common, general, and upon the whole the most efficacious of all manures. It promotes vegetation, by increasing the vegetable food, by enlarging the pasture of plants, by communicating to the soil a power of attracting the vegetable food from the air, and by preparing the vegetable food for the nourishment of plants. It is properly the excrement of animals; but is used also to signify all rotten vegetables, when used as manures. Dung of quadrupeds is the most common manure in use Stable-dung is used either fresh or putrified; the first is called *long*, the second *short* dung. It abounds in animal matter, easily putrifies, and serves to hasten the decay of other dead vegetable substances. Its fermentation is promoted by frequent turning and exposure to the air: yet it should be covered, to prevent water from carrying off most of its important ingredients: or, at least, the water that imbibes them should not be lost. Farm-yard-dung consists of various vegetables, chiefly straw, sometimes weeds, leaves, fern, &c. impregnated with animal matter: it ferments more slowly than stable-dung, should be piled in heaps, and stirred from time to time: fern in particular putrifies very slowly.—*Management.* When any considerable quantity of stable or yard dung, or other mixture of animal and vegetable substances, is collected together in a heap, and ferments; when this process is completed, if the mass be examined, we find that the vegetables, of which it was originally compounded, are decomposed, and in a situation to nourish new plants. The more completely therefore these substances are submitted to the process of fermentation, the more beneficial will be their effects upon the soil. Hence it is an object of the first importance to farmers to have their dunghills so situated and constructed, as to promote their fermentation, and retain all the useful parts of them. These circumstances have been very little attended to; the greater part of dunghills being either placed in hollows, and surrounded with water, which effectually checks fermentation by chilling them; or upon declivities, where every drop of water runs away: cattle are allowed to spread it by trampling, weeds to exhaust it, and carts and waggons are driven over it. Thus the middle, from being hard pressed, will be imperfectly fermented; and the sides, from being scattered about and dried, will not be fermented at all, but in a condition little better than dry straw. To promote fermentation in dung, air and moisture are necessary. It is well known to gardeners, that in making hot-beds, by laying the dung lightly in heaps, and watering it gently, fermentation is immediately brought on; and that hot-bed dung is as completely fermented in a fortnight, as that in a farm-yard generally is in six or eight months. The farmer should imitate this practice as nearly as the nature of his situation will admit; and instead of having his dunghill in the yard, and allowing carts, cattle, &c. to disturb it, he should place it in some distinct situation, convenient for his offices, where the urine may be kept with it, or else run into a receptacle, whence it may be thrown back into the dung to enrich it and promote the fermentation, or be carried off in carts to manure his land. When dung is taken to the dunghill, it should not be driven over the heap, as is commonly practised; because the feet of the horses and the weight of the carriage will press it so hard as to exclude the air, and thereby prevent the fermentation: when the quantity also is considerable, the horses are strained and the harness damaged by the exertions necessary to drag a loaded carriage over a hill of such loose materials. Every load ought therefore to be laid down by the side of the dunghill, at least after the work has made such progress as to render passing over it a matter of difficulty, and afterwards thrown up lightly with a fork; the labour of which is trifling, compared with the advantage resulting from it. If dung laid up in this manner contain a sufficient proportion of moisture, it will immediately begin to ferment; if therefore it be too dry, it should be watered, and in summer this will frequently be found necessary: it will thus be completely fermented in six or seven weeks, and will be more valuable by half than that made in the common slovenly manner. The situation best calculated for a dunghill is that which is nearest to a level, with a bottom capable of retaining moisture, and covered with a shed. If the whole be enclosed with a wall, except an open space at one end for carting away the dung, it will be a great improvement. The wall on the south side should be of such a height as entirely to prevent the sun's rays from reaching the dung; on the other three sides, six feet high from the ground will be sufficient. The roof may be thatched, and supported on pillars. If the bottom be not clay or chalk naturally, it must be laid with one of those substances, and the upper part should be paved with broad flags or common paving-stones. At the end opposite to the opening, a reservoir may be dug to receive the moisture; it should be water-tight, and a pump should be put into it to draw off the moisture daily. This may be thrown back on the dung-heap, or drawn into a barrel on a cart, and either spread immediately on the land, or mixed with other substances in a compost.—

Application. Dung is applied indiscriminately upon all soils, at almost any season, and for every crop. Of all manures commonly in use, none can be considered as a more immediate food for plants; and when applied to vegetables in a growing state, they immediately begin to thrive. On this theory, it seems absurd that great quantities of rich dung should be laid upon the fallows at the end of autumn, and still worse about Midsummer, there to remain till the ensuing spring before it can be of any use to the plants: for if the fallow be sown with wheat, or any other winter crop, the growth of the plants being stationary, they need little nourishment; in the mean time, the salts contained in the dung, after having been spread abroad a month, or perhaps six weeks, dissolving readily in water, are carried off by the winter rains; and when the spring arrives, and the plants begin to vegetate, a great part of what was destined for their nourishment has been washed away and lost: where fallows have been well wrought, and the soil thus completely reduced, mixing it with dung in that state prevents it from acquiring a sufficient degree of compactness to shelter the roots of the plants, especially if the soil be naturally of a light open texture, and the dung full of half-rotted straw, as is commonly the case. The operation of the winter's frost renders it still looser, so that in spring it is nearly in the state of a mole-hill; the baneful effects of which, to a wheat crop, are obvious. Now, were a portion at least of the dung withheld till the spring, the land would be more compact, the plants less liable to be thrown out of the ground by frost, and the dung being applied as a top-dressing at the time when vegetation was commencing, the useful parts of the dung would be taken up by the plants, every time it was moistened, as the crop in its progressive growth most wanted it. In this mode of application no part of the dung would be lost, and a less quantity being required for the dressing, three times the quantity of the land might be dressed annually; and being applied in a quantity sufficient only for the nourishment of the crop, the plants are fed in the same manner as the animal body, every small dose operating like a meal. Some are of opinion that the first rank quality of dung is highly beneficial, and its principal virtue. Mr. Belcher, on the contrary, is inclined to think that it is more or less injurious; greatly so in horse-dung, which is evidently unfit for plants when new. In his opinion, the best mode of using all dung, except in compost, on cold stiff ground especially, is to carry it on rough, and to fallow that and the soil together: whereby, at the same time that they are incorporated, the seeds of weeds are forced into vegetation, and completely destroyed. The common practice is to set the dung upon the land in small heaps or hillocks, and to spread it by a man standing on the ground. In some of the midland counties, the prevailing custom is to spread it out of the carriage, as it is brought into the field, by a man or men standing in the carriage. Dung should never be moved in summer. The immediate action of the sun's rays exhausts it of its moisture; and it is an erroneus idea that this evaporation carries off merely aqueous particles, for the salts, the oils rendered miscible with water by alkaline salts or calcareous earth, and the inflammable air, are all dissipated with the water. To turn a dunghill over, then to throw it into carts, exposed in heaps, and to spread it a second time in summer, is to give the sun a power of nearly exhausting its virtues. A Hertfordshire farmer, on the contrary, never carries dung out by choice in winter, thinking that the rains, &c. damage it much; but in summer he does not think its being exposed to the sun a detriment, supposing the heat to exhale only the watery particles. He has found one load laid on at midsummer as good as two or three at Christmas. The fresher the dung is used, the better he thinks it for any crop, even for grass, provided it be laid on early in autumn. He has found long dung, of only one or two months old, to be better, load for load, than black spit dung, for Turnips. In forming a dunghill, he says, the dung will not rot if the carts drive on to it; but if the dung be shot out of the carts at the side of the hill, and then thrown up, without any trampling, it will rot much sooner and better. This also is the Norfolk practice. At whatever time the dung is carried on the land, it should be spread, and ploughed in as soon as possible. It is said to be a wrong practice to lay dung upon Clover-leys in autumn; for if the field has to remain another year in grass, not only a part of the dung is washed away by the winter rains, but the remainder injures the plants; it being well ascertained that the action of dung upon broad Clover, when the plants are not in a growing state, is fatal to them. But in the spring, a light top-dressing of dung is highly useful to broad Clover, though soot is preferable. If the Clover-ley is to be ploughed for Wheat, and dung be laid on, if the grass crop has been good, the furrow will be turned over entire, and the dung laid flat under it; and as the roots of the Wheat must penetrate through the sod before it can reach the dung, little benefit can be expected from it, allowing the qualities of the dung to remain unimpaired: but in this case the loss from the winter rains will be greater than when dung is laid on fallow; for these being incorporated with the soil, a part of the salts will be entangled with the earth; but upon ley, it is either laid in the bottom of the furrow, or, if the sod be set on edge, it remains crammed into the interspaces through which the whole of the rain passes. Whenever Wheat therefore is sown upon ley, the dung ought to be used as a top-dressing in the spring, when every part of the crop will have the benefit of it; and the harrows having loosened the top of the furrow, so that the moisture of the dung will readily enter the land, no part of the dung will be lost. If the ley is to be ploughed for Oats, provided the land was well laid down, there is no occasion for dung; but if the land be poor, and dung is required, it cannot be employed in any way so useful as in the form of a top-dressing at the time when the seed is sown. Perhaps there is no way in which dung is used, where its effects are so certain and visible as upon Potatoes and Turnips. For Potatoes, it is laid on when the spring is pretty far advanced, after which there are few heavy rains; of course the strength of the dung is not impaired by washing, and the crop is left in quiet possession of the whole of its fertilizing powers. For Turnips, the case is nearly the same; indeed the advantage is still greater, dung not being laid upon Turnip land sooner than June, after which there is seldom much wet weather till autumn, and by that time the crop is in full vigour. As to laying dung upon meadows, farmers differ in opinion: some preferring the spring for producing an early vegetation and a plentiful crop; others thinking, that though dressings of soot and fine ashes at that season are of much use, yet that dung ought to be laid on at the end of autumn, not to taint the juices of the ensuing crop. It is thought to be a good practice by some, to spread the dung as soon as the hay is cleared. If laid on in the winter, or early in the spring, the frost will take effect upon the manure before the grass can reap any advantage; and the rains coming whilst the manure is exposed on the surface, washes away its virtues before vegetation is awakened by the sun. But in July, if there be any showers, the quick growth of the after-grass will shelter and protect the manure; and nothing is to be feared but a severe drought. In this case, however, the after-growth should be left through winter to

be fed in the spring, when the value of such feed will be great, and the dung, by means of such a covering, will be guarded against the frost in the best possible manner. Mr. Miller, however, reprobates the dressing of grass ground in summer, soon after the crop of hay is taken off the land: because before Michaelmas the sun will have exhaled most of the goodness, if the dressing be of dung, or any other soft manure.—It is mostly the custom to collect manure of every description into one heap. Hence substances very opposite in their nature, and which may be wanted at different times and for different purposes, are laid together, and, instead of forming a useful combination, perhaps prevent the dung from fermenting as it ought. Every farmer therefore should have at least two or three dunghills, to be prepared for use, according to the time at which the contents of each may be wanted, and the articles of which they are respectively composed. If earth, moss, shovellings of highways, &c. can be procured, the bottom of any dunghill composed of rank stable-dung, or short excremental dung, may be laid three or four feet deep with these substances. This will increase the quantity of manure, for the moisture that is pressed out during the fermentation will sink into the earth, &c. and impregnate it with its salts; and if the whole be afterwards turned and incorporated, what was laid in the bottom will be found of nearly equal value with the dung itself.—— Some distinctions are to be made respecting the different sorts of animal dung.—*Horse-dung*, is more distinguished for the readiness with which it ferments, than for its intrinsic richness. Stable-muck, or horse-dung mixed with straw, properly fermented, is of primary use in the kitchen-garden, where it supplies the want of the sun's heat in winter; affording at an early season many esculent plants, which we could otherwise have only for a short time in the middle of summer, and others which our moist and cold climate could not produce at all in any perfection; as Asparagus, Cucumbers, Melons, Colliflowers, Salad-herbs, &c. &c. See *Hot-beds*.—Horse-dung is certainly one of the best improvements for cold lands that can be procured in any quantity, yet alone, when it is too new, it is prejudicial to some plants; and if it be spread thin over lands in the summer, it is of very little service, because the sun draws all the goodness out of it, and it becomes little better than thatch or dry straw. Although too much of it can scarcely be used in a kitchen-garden, yet it may be a fault to lay too much on corn-land, because it may be apt to make the corn run too much to straw. In very moist cold land, crops will succeed better if new horse-dung, as it comes from the stable, be buried in it, than if the ground be dressed with very rotten dung. Horse-dung in a raw state is well calculated for Potatoes, because it leaves room for the roots of that plant to spread; but if it be not fermented, it contains much undigested vegetable matter, and consequently the seeds of many weeds which may have been mixed with the food of the animal. *Cow-dung*, is very useful for lean, dry, hot, shady, or gravelly soils. The excrement of a ruminating animal is held to be preferable to that of horses at grass, owing to the quantity of animal juices mixed with their food in chewing; but since it does not contain much undigested matter, it will hardly heat. The best way of managing it, is to lay it together, and keep it moist till it be sufficiently putrified. Mixed with mud, it makes a good manure for some soils; and for almost any, when mixed with horse-dung.—*Sheep's dung* and *Deer's dung* do not differ much in quality, and are esteemed by some persons as the best manure for cold clays. Others recommend them to be used as top-dressings to autumn and spring crops, four or five loads to an acre, in the same manner with ashes, malt-dust, &c.—*Hogs'* or *Swine's dung* is the fattest and most beneficial of all the animal dungs; one load, it is said, will go as far as two loads of other dung. It is commonly asserted, that the dung is richer in proportion as the animal is fatter; and being of an oily and saponaceous quality, is excellent for arable lands, but should be used cautiously, because it is apt to be full of weeds. It is the best suited for fruit-trees, especially apples and pears in a light soil, and a very rich manure for grass. Mr. Miller declares he has often used it to fruit-trees when it was well rotted, and found it the most beneficial of any manure.—*Rabbits' dung*, appears, by an experiment of Mr. Arthur Young, to be superior even to that of pigeons, and to last the longest. But this experiment should be repeated, before we can give credit to what seems improbable.—*Dung of Birds.* Pigeons' dung is certainly a rich manure, but not lasting; it must therefore be renewed the oftener. It is most applicable to cold and deep stiff land. Sometimes it is sown upon wheat-crops in the spring. It should always be broken very small, and sown during moist weather; and if circumstances will admit of its being harrowed in, so much the better. Poultry manure is of the same nature, and, where it can be had in any quantity, is an excellent top-dressing, particularly for cold land. The dung of pigeons, poultry, and geese, is also a great improver of meadow lands: but before it is used, it ought to lie abroad some time, that the air may sweeten it a little, and mollify the fiery heat of these dungs. They should be dried before they are strewed, being apt to clod in wet; and they ought to be mixed with sand, earth, or ashes, to keep them from clinging together, that they may be strewed thin, being naturally very hot and strong. They are recommended as the best manure for Asparagus, Strawberries, and any sort of flowers; but for the latter, they should be well rotted, and mixed with earth. They are also said to be good for trees, the leaves of which are apt to turn yellow; and for this purpose should be spread an inch thick at the foot of the tree in autumn. Considerable quantities of valuable manure might be raised by those who, living near large commons, keep great flocks of geese, if they were regularly housed at night, and the place were littered with straw, fern, saw-dust, ashes, or sand. The same advantage might be reaped by littering the places where other kinds of poultry roost. Every three or four weeks the places should be cleaned out, and the dung laid in heaps to ferment, either alone or mixed with soil.—*Night Soil*, or *Privy Manure*, says Mortimer, is of all sorts of dung the greatest improver of land, especially if mixed with other dung, straw, or earth, to give it a fermentation, and to render it convenient for carriage. It sells in foreign parts at a much greater rate than any other sorts of manure, and may be bought in London for five shillings a load. In China and Japan, wonderful attention is paid to saving this manure, which in those countries is preferred to all others, both on account of its richness, and its being free from weeds: insomuch that Thunberg, the famous botanist, passing through Japan with the Dutch embassy, could scarcely find any other plants in the corn-fields but the corn itself. In those countries the law prohibits the waste of human excrement; and every house has reservoirs for it, to the great annoyance of the traveller through their towns. Mr. Young has found the effect of night-soil (from 160 to 320 bushels per acre) prodigious, trebling the produce on lands unmanured: and he asserts, that in all the experiments he has made with this manure, he has found the result almost uniform. In a meadow lately laid down, and in very poor condition, two acres of the worst part being covered after hay-time with four waggon loads of night-soil, unmixed with any thing, and spread

directly, the herbage thickened surprisingly, and grew most luxuriantly. The cattle neglecting the rest of the field, were perpetually feeding on this part; so that by autumn it was pared down like a fine green lawn, the other part being a dusky, rough, rugged pasture. The part of the field manured with night-soil continued excellent. How strange then does it seem, that this manure has been neglected in most parts of Europe, and particularly in England, where the greater part is suffered to run to waste, besides poisoning our rivers. Lime thrown into the privy, will make an excellent mixture with the excrement, and at the same time removes the ill smell and noxious vapours of it. Saw-dust, peat-moss, or any common earth, will be highly useful in absorbing the urine. Lime will also render the excrement so short and dry, that it may be used as a top-dressing. Two cart-loads of ordure, mixed with ten loads of earth and one of lime, will be a sufficient top-dressing for an acre, and is excellent upon light lands for wheat and barley: for the former of which, it should be used early in the spring; and for the latter, it may be either scattered upon the young crop, or harrowed in with the seed. It is particularly convenient for all drill crops.—*Urine*, of every sort, is found to be of great use, when laid upon grass or young crops early in the spring. The most convenient way of applying it seems to be in the form of a compost, with earth and a small proportion of lime. In this shape it is a good manure for moist soils, particularly such as are light, sandy, or gravelly. Great quantities of this article might be saved; and, judiciously used, would ensure one or two good crops: about all farms, and great towns, it might be collected into reservoirs, with other excrements, without much trouble. In some countries this is an object of police, especially in the towns, where reservoirs are established for collecting it; the farmers carry it away in barrels, and either sprinkle it immediately upon their fields, or mix it into composts.—*Bones*, are used as a manure, both by themselves and with other substances. The common way of preparing them is, to break them with a mill into pieces about the size of a marble or nutmeg; they are afterwards laid upon the field in small heaps, at regular distances, and covered with earth: after remaining in this state for some time, they are spread on fallows, on grass, or on turnip-land. Of all manures, bones are probably the most permanent; and when used in their simple state, without the addition of earth or lime, they ought never to be laid upon any but the sharpest and most active soils; such as limestone, chalk, or gravel: upon all these they will meet with more or less calcareous earth; which will, in some degree, disengage their fixed air, and dissolve the oil contained in them: but upon deep clays, tills, or loams, they should never be applied in that state. But when made into a compost, they may be applied with advantage upon soils of every description, by laying them upon or near the surface, when the crop is in a growing state. Upon wheat, it should be used early in the spring, without harrowing; upon barley and oats, it may be harrowed in along with the grain. For drill crops, such as Turnips, Beans, &c. they are particularly convenient, as they admit of being put into the drill at the same time with the seed, more readily than most other manures.—*Horns*, of every kind, are useful in manure, when cut into small pieces; in their natural state they produce little effect: the proportion proper to be employed varies with the size of the chips or shavings; fewer being necessary, when small; but the effect of the larger are longer felt. If they are of a middling size, about sixty stone to an acre is a reasonable quantity; if more be used, the grain is apt to be too luxuriant, and too long in ripening: it is also liable to be injured by mildew. The small pieces are chiefly turner's shavings, bought at twelve or thirteen shillings per quarter, and are much the most useful: the large ones are refuse pieces of horn, costing about two shillings less per quarter, and are generally ploughed in three months before sowing Wheat or Barley. They both answer in most soils and seasons, except very dry seasons. Hoofs are of the same nature with horns, and answer the same purpose. The offal of fish would be worth attending to, especially where they are cured in considerable quantities, as at Yarmouth.—All *Recent Animal Substances*, as blood, and the whole refuse of slaughter-houses, shambles, &c. afford a very rich manure: mixed with earth, and fresh horse-dung, they make a very rich compost. Blood mixed with saw-dust makes a good land-dressing, to be sown upon wheat in the spring. *Putrid Animal Substances*, are good manures, if properly managed: when used alone, they should always be laid upon the most active soils, such as chalk, limestone, &c. The most proper way of preparing them for use is, to mix them with chalk and quick lime; the mixture should be laid in heaps of three or four cart-loads each, and covered with earth: after remaining in this state for eight or ten days, the heap should be turned over, and ten cart-loads of earth added to each cart-load of the mixture. It should then remain a month in the heap, and may afterwards be applied as a top-dressing, or harrowed in with the seed.——Refuse of Manufactures. Under this head, a variety of articles may be enumerated. *Fellmongers' Cuttings*, or *Pouke*, is used in Surrey and Kent, and about Dunstable, where the price is sixpence a bushel; and they use from twenty to forty bushels an acre. It is composed of sheep's trotters, hair, scrapings of the pelts, lime, &c. There are two sorts, the white and the brown: the white is much the best, having more oil, lime, and hair, in it; but they are both good, and go farther in dressing land than almost any manure, in the proportion of four to one.—*Furriers' Clippings*, are sown by hand, from the seed-scuttle, on land intended for wheat and barley, and immediately ploughed in: the pieces that are left above ground are pricked in by a stick, to prevent their being devoured by dogs or crows: from two to three quarters are used on a statute acre. They answer well on light dry chalk or gravelly soils; where they hold moisture, and help the crop greatly in dry seasons.——Sea Weed. *Ware*, or *Ore*, is used as a manure upon almost every part of the coast where it can be obtained in sufficient quantity. In several parts of the kingdom, the value of land has increased six-fold, from the circumstance of the proprietor or occupier having easy access to it. Upon lands situated on a dry limestone bottom, it has produced the most surprising effects. The sea-weed commonly used in Scotland, is of three different sorts: the best is that which is cut from the rocks, and of which kelp is made; the second is called the peasy sort; the worst is that with a long stalk. The common practice is, to spread the weed, immediately after it is brought from the shore, either upon the stubbles or grass lands: when laid upon the stubbles, it is generally ploughed in as soon as possible. Farmers who can use it fresh do not lay it in heaps to ferment; because a load of fresh ware will be of more service fresh, than two loads laid in a heap to ferment. In most cases sea-weed may be conveniently used in this way; for where a farm is under proper rotation, there will always be ground to lay it upon. During the winter months, it may be put upon the ley and stubble fields; in the spring, upon the bean and barley lands; during summer, the fallows will require all that can be collected; and by the time these are sufficiently manured, the clover fields, after the first cutting, will be ready to receive the remainder; through the autumn, the stubble fields will require all that can be collected. Thus, throughout the year this valuable manure may be used as

soon as it is thrown upon the beach; and experience proves that its greatest value is in that state. If, moreover, more weed is thrown up than is wanted for immediate use, it is an object of importance to preserve its qualities as much as possible. This is best done by making it into a compost, with earth, and a small proportion of lime. If the quantity of earth be great enough to absorb and retain the juices and salt of the sea-weed, the proportion of lime moderate, the whole well incorporated, and protected from heavy rains, it will be found nearly as valuable as in a fresh state. After the compost is properly mixed, lay it up in the form of a ridge, with a pretty sharp angle at top, covered two or three inches with earth, well beat with the back of a spade, and defended from the rains with straw. This compost will be found a good dressing for young crops of every description, and may be used either at the time of sowing the grain, and harrowed in along with it, or after the plants have made some progress. Upon wheat, it should always be used to the young crop early in the spring; upon rich deep land, it is bad husbandry to lay sea-weed, or indeed any heavy rich manure: lime, chalk, and shells, are the proper substances. This manure seems peculiarly adapted to lands that have been hurt by over-liming: the bad effects of which it will more readily correct, than any other, except oil and animal substances.—*River Weed.* In summer great quantities might be gathered, in lakes, in rivers where the water is deep and has no current, and in all wet ditches. Its effects upon wheat and other grain, as well as upon Turnips, Cabbages, and other green crops, are well ascertained. It may be laid on the land green, and ploughed in; or it may be mixed with earth and dung. The best way of preparing it for manure is, to let it lay in small heaps for a day or two, to drain off the superfluous moisture. It may then be put into large heaps, of three or four cart-loads each, till the fermentation is over: each heap should then have three times the quantity of earth or mud mixed with it. Incorporate them well, and let them remain for a week or ten days; turn them, adding at the same time a quantity of hot new-slacked lime. This compost will be ready for use in a month.—*Other Weeds.* Rotten vegetables, of most sorts, will enrich land. Not only the weeds of ponds, lakes, rivers, or ditches, but any other sort of weeds, laid in heaps to rot, will make good manure: such as the weeds which too commonly disgrace the headlands and balks of arable lands, commons, &c. the refuse of kitchen-gardens, &c. Whenever any weeds are used for manure, they should be cut down as soon as they begin to flower, for if they be suffered to stand till their seeds are ripe, the land will be stored with weeds, which cannot easily be destroyed: and some kinds of weeds, if permitted to form their seeds, will perfect them after they are cut down. The surest method, therefore, is to cut them just as they begin to flower, when they are in the greatest vigour, and fuller of juice than when they are farther advanced. In rotting these weeds, it will be proper to mix earth or mud with them, to prevent their taking fire; as they are apt to do, when laid in large heaps. When they are well rotted, they form a solid mass; which will cut like butter, and be very full of oil. Fern mowed while it is green and tender, and laid in heaps to rot, will make a good manure: or it may first serve the purpose of litter in the stable or yard, and thus increase the quantity of dung. This, with thistles and other large weeds, may be laid in heaps and burnt to great advantage; the ashes being an excellent top-dressing for any crops.——Mud, whether from the sea, rivers, or ponds, is an excellent manure, on any soil, with or without lime. Its greatest value is upon thin soils; the fertility of which it increases amazingly, at the same time adding to the staple of the land. It should not be laid on fresh, or as soon as it is dry; but it should be well turned over, and fermented with dung, or mixed with lime, to make the seeds in it vegetate, or to destroy their vegetation. Innumerable seeds fall, or are carried into the water, sink to the bottom; and not being aquaties, if they have much oil in them, are embalmed in the mud for years or ages, to vegetate whenever they shall happen to come within reach of the atmosphere, in a proper matrix. It may be dug between hay-time and harvest; and either made into a compost when dry, or, being turned over and levelled, and exposed to a winter's frost, may be dug in spring, and planted with Potatoes. In Cheshire, the soil deposited at the extremity of salt-marshes, commonly known there under the name of *Sea-sludge*, after it has been grassed over for a few years, is said to be the most productive and lasting of any sort of manure; containing all the strength of marl, and the richness of black dung.—*Street Sweepings.* This is a mixture of most substances valuable in agriculture, and needs the assistance of fermentation less than any of them, to render it fit for use; being made up principally of the offal of houses, dung of horses and cattle, ashes, &c. It may be either ploughed in as dung, or used in the spring, to invigorate wheat that is weak, from not having been sufficiently manured, or from any other cause. It may be employed in general as a top-dressing, or put into the furrow with drilled crops.—*Road Sweepings.* The dung and sand swept up, or dirt shovelled up, on turnpike roads, would make an excellent manure, and at the same time remove a great annoyance to travellers. Where roads are made with limestone, this manure will be particularly valuable; and where they are made with flints, it answers for grass land.—*Rubbish.* The backs of ditch-banks, the borders of fences in general, the sides of lanes, and the nooks of yards, which are suffered to remain from generation to generation the nursery of weeds, turned up into ridges to rot the roots, &c. make an excellent manure; as also does the rubbish of old buildings. Sea-stone walls afford a great quantity of this valuable article; which, from its immediate effect and duration jointly, is considered by some as superior to marl, mould, or even dung itself, especially upon scalds and hot-burning soils. The rubbish of old lath and plaster buildings is incomparable manure for Clover leys, or grass lands, two loads to an acre; and is said to last twenty years. Lime-rubbish is used by gardeners to bottom gravel-walks, to mix with earth for Tulips, &c. and to plant Vines and Figs. Mud or earth walls acquire considerable fertility; and as they moulder, or fall away, become useful in the compost dunghill.—*Malt-dust, Comb*, or *Coombs*, is the dust that separates from the malt in the act of drying; and is used as a top-dressing for Barley, Clover, Turnips, &c. This is reckoned one of the most efficacious manures. Mr. Miller says, it is a great enricher of barren ground, having a natural heat and sweetness in it; which imparts to the soil a proper fermentation, especially where grounds are a natural clay, and have contracted a sourness and austerity; whether from having long lain untilled and exposed to the air, or from water having stagnated upon them.—*Oak Bark*, or *Tanner's Bark*, after the tanners have used it for tanning leather, when laid in a heap and rotted, is an excellent manure, especially for stiff cold land; in which, one load of this manure will improve the ground more, and last longer, than two loads of the richest dungs: and yet it is very common to see large heaps of this remaining for many years in the tanners' yards; where manure of other kinds is very scarce, and often carried to a great distance. Of late years this has been much used for hot-beds in several parts of England, and is found greatly to excel horse-dung for that purpose; the fermentation being

moderate, and of long continuance: so that a bed of tan, when rightly made, will continue in a moderate temper of heat three or four months; and when the heat begins to decay, if it be stirred up with a dung-fork, and some fresh tan added to it, the heat will renew again, and will last for some months; so that these beds are by far the most kindly for exotic plants: and whatever plants are plunged into these beds, if they are permitted to root through the bottom of the pots, they will thrive more in one month after, than they did in four months while they were confined to the pots. Many plants that root through the pots into the tan, send forth roots upwards of twelve feet each way, in less than three months; and the plants advance in proportion. After the tan is used for a hot-bed, it may be spread on the ground for manure, and will greatly enrich it; because it is of a warm nature, and will loosen and separate the earth. When this manure is laid upon grass, it should be done soon after Michaelmas, that the rains may wash it into the ground; for if it be laid on in the spring, it will burn the grass, and, instead of improving, will greatly injure it, at least for that season. Where it is used on corn-land, it should be spread on the surface before the last ploughing, that it may be turned down, for the fibres of the corn to reach it in the spring: for if it lie too near the surface, it will forward the growth of the corn in winter; but in the spring, when nourishment is chiefly wanted, it will be nearly consumed, and the corn will reap but little advantage from it. Nor will it be proper to have this manure lie too near the roots of any plants; as in that case it is injurious to most of them, but especially to bulbous and tuberous rooted flowers. But when it is buried just deep enough for the fibres of the roots to reach it in the spring, the flowers have been exceedingly improved by it: and in some places where this manure has been used in kitchen-gardens, it has greatly improved the vegetables.—*Soot*, is used as a manure in almost every part of our island, where it can be procured in sufficient quantities, and is applied in every different shape, and to all crops. Used in its simple state, it answers best upon light gravel, chalk, or limestone soils: if in a compost, the proper proportions are, two loads of soot, the same quantity of lime, and ten loads of earth. The soot and earth should be well incorporated, and remain in a heap a week or ten days, then turned, and the lime added in strata as it is turned over; in this state it may remain a month or six weeks, and be again turned, taking care to break every part of it as small as possible, by working it well with the spade: in a week or two more it will be ready for use. This compost may be applied upon every sort of grain, especially Wheat or Barley; and if rain fall soon after it is laid on, it will immediately begin to operate. It answers best on light, dry, chalky soils, and in moderately wet seasons: it does little good on strong or wet land, or in very dry seasons, unless sown earlier than usual. The London coal-soot is generally mixed with cork-dust, coal-ashes, or sweepings of the streets: yet even in this adulterated state, it is found to answer much better than country soot from wood. It is an excellant manure for pasture land, in the quantity of forty bushels to an acre. —*Peat Moss*, can only be made useful by fermentation; to bring on which, dry the peat-moss well, break it into small pieces, and lay it on the ground to the thickness of three or four inches. Let the whole of the dung from the stables be laid over it. The moisture of the dung will sink down, and not only correct the acidity, but saturate the peat-moss completely with the valuable properties of the dung. Turn the dunghill over, and mix the dung and peat-moss carefully together, throwing them up lightly; and a gentle fermentation will come on. After a few weeks turn it over again, adding one load of lime to five loads of moss; the whole being well broken, and accurately mixed. The addition of the lime will hasten the putrefaction of the moss, dissolve the oil contained in it, and give a due degree of activity to the whole. Another way of effecting this is, to pour the urine of cattle, the moisture of the dunghill, soap-leys, and offal of the house, upon peat-moss; and afterwards to mix it with stable-dung and lime.—*Ploughing in Green Crops.* Many sorts of vegetables may be sown, in order to be ploughed in when they are in full growth, to enrich the land. The ancients ploughed in Lupines for this purpose; and that practice is still continued in Italy, and the south of France, but they are too tender for our climate; and we have better plants for the purpose, as Pease, Beans, Buckwheat, Turnips, Vetches, Clover, Spurrey, and other moist and juicy plants, as Mustard, Coleseed, and other large-growing plants, which are cut before they form their seeds, when they are in full bloom, and abound most in sap. When we consider at what small expense of prime cost, carriage, and other charges, this manure is obtained, and how completely it smothers the weeds, it is wonderful that it has not more generally been adopted. It might, no doubt, be used on many occasions, in place of a complete summer fallow, as a preparation for wheat: in which case the price of the seeds, which is almost the only expense, would be amply repaid by the saving in the article of labour. Their value might be much improved by laying on a certain quantity of lime, chalk, or marl, according to the nature of the soil; which would tend greatly to hasten the fermentation, and bring the land sooner into a proper state for affording nourishment to the succeeding crop of wheat.——Earth. Maiden or untried earth, such as is found six or seven inches deep under turfs or commons, headlands, and by the sides of roads in many places, where it is of good quality, is of inestimable value as a manure for fruit-trees, raising shrubs and trees in nurseries, all sorts of crops in kitchen-gardens, and ornamental flowers, as well as corn and grass. The nurserymen near London send many miles for a loamy maiden earth, as absolutely necessary for their purpose. It is recommended in preference to dung, for both fruit and kitchen gardens, particularly for Asparagus, laid a foot and half deep, without any dung whatsoever: mixed with dung or lime, it makes excellent manure for Corn or Turnips. Doubtless there are many sorts of earth that might be employed with success, besides those in common use, if they were examined by men skilled in their respective properties, and applied by persons versed in their operations. —*Chalk*, is in high esteem in the southern counties of England, where it abounds: its best effects are upon deep soils, which contain no calcareous earth, and is observed to have very little effect upon lands where the substratum is chalk; and even does mischief, where the soil is thin. When used upon light soils, it is made into compost with earth and dung. When this is well mixed, and duly proportioned, it produces valuable crops; and the effects continue for many years. The common method of using this compost is, either to lay it upon fallows for wheat, and mix it intimately with the soil, or upon grass, as a top-dressing; in both cases it answers well; in the latter, it destroys moss-rushes, and all coarse aquatic plants that grow in sour or wet lands; in the former, it opens and pulverizes the soil, and never fails to produce good crops. Chalk should be broken as small as possible, and in no case ploughed in till its parts are properly separated; and then it should be completely harrowed in, and well mixed with the soil.—*Lime.* Respecting the proper quantity of lime, it may be observed in general, that the greatest should be used upon the deepest and richest soils; and the least, upon those that are thin and light. Upon strong clays and deep

loams there is a substantial body for the lime to operate upon, containing abundance of rich substances; and considerable quantity will be required, to pervade and give due activity to the whole: but as the soil is lighter, the quantity must be less, and the after-management, with regard to the crops, extremely cautious. In liming a single field, an attention to the quantity will often be found necessary; the soil of the higher parts being for the most part more light and free, and that of the lower more deep and compact, where the ground is unequal. On some soils, particularly where the bottom is chalk, limestone, or marl, lime will be pernicious, especially if the soil be thin. Lime is found to produce the best effects upon fallows, when laid on early in the season, and well incorporated with the soil. By the assistance of lime, whole districts, formerly useless, have been made to produce not only good crops of Turnips, but also valuable crops of Corn and broad Clover. Its greater value, however, seems to be upon light soils for those crops; insomuch, that where lime is the principal manure, they seldom sow Turnips, Clovers, Pease, or Beans, except upon lands that have been previously limed. Instances of this are often met with on the up-lands; where if any of the broad-leaved crops are sown where a part has been limed, and a part not, the parts where the lime has been laid will produce a valuable return; while that which has been dunged only, will hardly repay the expense of seed and labour. Farmers differ in their methods of using lime upon Turnip lands: some lay it on only before the last ploughing, and plough it in without harrowing; they also lay it in heaps, hot from the kiln, without being slaked. But the sooner it is laid upon the land, and the more ploughings and harrowings it receives before the seed is sown, the better it will be incorporated with the soil, and the more certain and valuable will be its effects. Upon Clover-ley, for Oats, is perhaps the worst way in which lime can be used. It is generally laid on in the autumn, and ploughed down in the spring; and the returns are inadequate to the expense. Lime is used as a top-dressing, in spring, upon Grass, or Wheat, and other grain. Upon the latter it is dangerous, unless the lime be made into a compost with dung or earth: in this form it will not only be safe, but profitable. Upon the former it is no better, except upon coarse meadows, abounding with rushes and weeds, which it destroys. Upon light soils, if several white crops be taken in succession after liming, the land will be worn out. A white and a green crop should be taken alternately. Upon clay lands, a summer fallow is sometimes indispensable; in that case the lime should be laid on in July or August, and completely harrowed in before ploughing: two or three ploughings at least are required to incorporate it well with the soil, and a suitable harrowing with each.—*Marl*, has been long celebrated as a manure. Barren sands, and poor heaths, have been rendered productive by marl, but at a great expense: indeed there is reason to believe that the greatest part of the southern district of Lancashire has been reclaimed by it; but it will not produce its full effects upon the soil, till it is incorporated with it by several ploughings, and dung, or other oily manure, mixed with it. Mr. Coke, of Holkam, in Norfolk, who has marled many hundred acres, always spreads the marl on the new ley, that is, on the seeds, after the barley harvest, from eighty to one hundred loads an acre; and on these dry soils it does little injury to the grasses. By this mode, the marl is on the ground at least three years before the plough enters; which is far better, and more durable, than ploughing it directly. In open fields, marling seldom answers the expense; for this is only a beginning of improvement: by going on directly with a course of ploughing, which cannot well be avoided in shiftable fields, the marl is often buried and lost before it mixes properly with the soil, especially if turned in too deep in the first earth, of which great care should be taken. Marling, therefore, can only or chiefly answer on inclosed land, that can be managed as the occupier pleases. In that case, it should be laid down with Clover, Ray-grass, and Trefoil, the spring twelve-months before laying on the marl, and remain at least six months after, that it may have time to sink into the flag before it is ploughed up; and then there will be little danger of losing it, as it will be in some measure incorporated with the soil. No pains should be spared to break all the lumps, and to get it fine by repeated harrowings and rollings, and to have the stones picked and carried away, that the grass may get through, for stock to be grazing upon it; which is the great and finishing improvement. After the land has been got fine, and laid six or eight months longer; in February, or the beginning of March, break it up, and sow it with Pease; then fallow for Turnips, giving it four or five earths, with harrowings, &c. After feeding off the Turnips upon the land, sow Barley, and lay it down again with Clover, Trefoil, and Ray-grass. Let it lay two summers; after which, by either folding or dunging it, if not too poor a sand, there will be a good chance for a crop of Wheat; after which, fallow again for Turnips and Barley, or Rapeseed and Oats, and so on; always bearing in mind, that taking two following crops of corn, without a fallow, or summer grazing, will soon bring newly improved land to its former impoverished state.—*Crag*, is a sort of shell marl, being chiefly shells whole, or in a decaying state, mixed with calcareous earth; which probably is nothing but the shells perfectly decayed. For Turnips, the benefit has been found equal to that of dung, in Suffolk; yet the greatest effect was on a moory bottom. The Sandlings, a tract of land in that county, near Woodbridge, seem to be upon a foundation of this red shell marl or crag; the use of which is, however, discontinued, except for taking in walk land, as they call it, for sheep. Upon old improved lands they never lay it singly, but mix it with dung, earth, or ouze; thinking that it makes light lands blow more. Mr. Young, in his *Eastern Tour*, says, that crag is dry, and not in the least soapy; that it does not effervesce in acids, and does not fall in water; that notwithstanding this, all the effects, and even more, produced in Norfolk by sixty, eighty, or one hundred loads of marl, are gained in Suffolk by ten or twelve of crag; and that it lasts even longer: which they have discovered from an idea, probably unfounded, that land once cragged will not bear a repetition of it, except in a compost with dung; and accordingly, in many cases, it has lasted, with such additions, fifty, sixty, and even one hundred years. The nature of the poor sands in that county is quite changed with it; and they gain an adhesion, which they retain for ever. Crag is a great fertilizer, as appears from the sudden increase of the crops after its application.—*Shells* and *Sea Sand*, are used to great advantage in several parts of England, especially in Devonshire; where they are at the expense of fetching the sand and shells, on horses' backs, twelve or fourteen miles. The land on which they lay this manure, is a strong loam, inclining to clay. Where the land lies near the sea, so that either sand, shells, corals, wrack or sea-weeds, can be obtained at an easy expense, they are by far the best kinds of manure, because they enrich the land for several years; for as their salts are closely locked up, they are communicated by degrees to the land, as the heat and cold causes the various bodies to pulverize, and fall into small parts: so that where sands, and smaller kinds of sea-weeds, are used, if they are laid on land in proper quantities, it will enrich it for six or seven years; but shells, corals, and other hard bodies, will continue many years longer. All shells are principally cal-

careous earth, and, when burnt, afford the best of lime. In a recent state they are of little value as a manure, unless they are broken very small; but in a decayed state they resemble shell-marl. Upon deep loams and strong clays their operation is similar to chalk or marl; but upon light gravels or sands, little benefit is to be expected from them, unless they are previously made into a compost with dung, clay, or loam. When such lands are in grass, by top-dressings of any of the different earths, their value will be much improved; and the thinner the soil, the greater will be the profit arising from this management. On clay pastures, shells in their simple state will correct acidity, destroy rushes, and render the soil less retentive of moisture. Sea-sand is an excellent manure on a summer fallow for Wheat; but being repeated two or three times, loses much of its good effects, without a change of tillage. Straw being scarce at Yarmouth, they litter their stables with sea-sand; as the bed becomes soiled or wet, fresh sand is scattered on, until the whole is in a manner saturated with dung and urine; the stall is then cleared, and a fresh bed of sand laid in. Thus muck of a singularly excellent quality is produced. Sea-sand is much used by florists in Holland, where they draw their parterres into ridges before winter, and spread it on the tops of them.—*Common Sand.* This can scarcely be considered as a manure; it is, however, beneficial upon all clays, and other tenacious stiff land, by separating their parts, and destroying their cohesive quality; by which means the sun, air, and frost, penetrate them the better. It is likewise of great use upon rough coarse meadows: nothing fines the surface more, or produces a thicker sward of Dutch Clover. The best sand is that which is washed out of highways or from hills, by rains, or that which lies in rivers.—*Clay.* As sands are an improvement to clays, so, on the other hand, clays are an improvement to gravelly and sandy lands; yet we have frequently observed clayey and sandy grounds lying almost contiguous, without any attempt having ever been made to make an experiment on this obvious interchange of soils. It must be remembered that marl and clay are often confounded, and that marling is frequently called claying. The extent to which claying has been carried in the sand districts of Suffolk, is very considerable. An excellent cultivator near Bury, though not on a very large farm, has carried 140,000 loads. But when this clay is not of a good sort, that is, when it has very little clay in it, but is rather an imperfect hard chalk, there are great doubts how far it answers, and in many cases it has certainly been spread to little or no profit. The usual quantity is from sixty to eighty, and sometimes one hundred loads, of thirty-two bushels, to an acre. The duration, and indeed the whole effect, depends much on the course of crops. If the plough be too frequently used, and corn sown too often, it answers badly, and the effect is soon lost; but with management it lasts twenty years. In many cases, a course of fallow and Rye, or light Oats, is converted to fine Barley, Clover, and Wheat, and the produce multiplied twenty-fold; but the cases in which the return has been inadequate are not a few: and on soils that will yield Saintfoin, it is more profitable to cultivate that, than to clay the land for corn. Probably this clay was more properly a marl. In stiff deep clays, where manure is not to be had in sufficient quantities, and fuel is cheap, it may be no bad process to burn some of the clay, which will not only break the cohesion of the soil, and make it more easily cultivated, but will also render it less retentive of moisture, and thus more friendly to vegetation; but upon thin soils, it is evident, any attempt at burning would be highly improper.—*Ashes*, of all kinds of vegetables, are an excellent manure or top-dressing for land.—*Pot-ash*, or *fixed Vegetable Alkali.* In places far removed from the means of improvement, a substitute for common manures, that is of easy carriage, and can be had at a moderate expense, must be valuable. From experiments that have been made, it appears that two hundred pounds of pot-ash are sufficient for an acre of strong land; for lighter soils, much less is required, if laid on by itself; on these, however, a compost of this and oil, incorporated with mould, will be the best way of employing it. Upon strong clays, and deep loams, however, it ought always to be applied by itself. When the expense of carriage is considered, pot-ash will often be found a cheaper manure than lime. In one respect it is superior, for the union of pot-ash with all the different acids form a neutral, which is in some degree useful in vegetation; whereas when lime meets with the vitriolic acid, it is almost entirely lost.—*Kelp.* The operation of kelp depends upon the same principles as lime, pot-ash, &c. Like them, it produces the best effects on deep loams or clays; and the benefit will be still farther increased, if lime be made use of along with it. Kelp should be broken very small with large hammers, or by passing it through a mill.—*Bleacher's Ashes*, or *Refuse*, consists principally of the hard undissolved parts of pot-ash, kelp, weed-ash, and barilla. Alone, they are too stimulating, and ought never to be used but with earth, or earth and dung; they answer well with blood, garbage, and putrid animal substances. They are generally laid upon fallows for Wheat. The greatest advantage derived from them is upon clay or deep loams. Upon rushy grounds, or coarse wet meadows, they will be found particularly useful.—*Soap Ashes*, which are in some measure the same as the refuse of bleach-fields, are generally made into composts with earth and well-fermented dung, in the proportion of two loads of dung to one of earth; the ashes are then added, in the quantity of one load to ten of this mixture, turning and incorporating the whole completely. The quantity necessary for strong clays or deep loams is ten cart-loads to an acre. If the dung has been well fermented, perhaps the most profitable way of using this compost, will be as a top-dressing harrowed in with the grain; taking care, however, that the caustic quality of the ashes is properly blunted by a sufficient mixture of dung and earth. These ashes, when beaten small, may be made into a rich compost with oil and earth, and used as a top-dressing for young crops. They will destroy slugs and vermin of every description; and are therefore highly valuable on lands where the early Wheat is injured by the worm. Laid upon grass-lands in the end of autumn, this manure produces a deep verdure during the winter, and an early vigorous vegetation in the spring; it is therefore particularly calculated for cold wet pastures.—*Peat-ashes.* Eight or ten bushels of rich peat-ashes are sufficient to dress an acre. They should be laid on in the spring, before the plants have attained any great size, in wet, or at least cloudy weather. Or, they may be sown and harrowed in with the grain; in which case a greater quantity will be requisite than when they are used as a top-dressing. They greatly improve grass lands, particularly Clover and Saintfoin; the quantity is from fifteen to twenty-five bushels, according to the condition of the land. Peat-dust, or peat ground to powder, answers equally well with the ashes in the same quantity. It is esteemed the best manure for Asparagus, Onion beds, and flowers, mixed with dung; and destroys thistles, if laid on in sufficient quantity, or repeated.—*Wood-ashes*, are useful as a manure, principally upon account of the pot-ash which they contain. The ashes of fir, pine, &c. have very little of it; but oak, ash, and most of the hard woods, abound in pot-ash. Except upon the strongest and most tenacious soils,

the rich kinds of wood-ashes are too stimulating, and are best used in a compost with earth and dung, or any animal substances. They effectually correct sour soils; consequently upon poor meadows, or rushy grounds, they produce effects similar to lime; and if mixed with quick lime, their beneficial effects will be heightened.—*Coal-ashes*, are well adapted to clays and deep loams, by breaking the tenacity of the soil. On light soils they should never be used but in the form of a compost with earth, or earth and dung. From fifty to sixty bushels is a complete dressing for a statute acre; and they are of great use in a kitchen-garden, where the natural soil is too strong and stubborn.——Composts, are various, and ought to be different according to the different nature or quality of the soils which they are designed to meliorate; and according as the land is either light, sandy, loose, heavy, clayey, or cloddy. A light loose sand requires a compost of a heavy nature, as the scouring of deep ditches, ponds, &c. A heavy land requires a manure of a lighter nature, that will insinuate itself into the lumpish clods.—*For Gardens.* The great use of composts in gardening is for such plants as are preserved in pots or tubs; or in small beds, or borders of flower-gardens. As some plants delight in a rich light soil, others in a poor sandy soil, and some in a loamy soil, there should be different composts prepared in all those gardens, where a great variety of plants are cultivated; and this is much more necessary in countries at a great distance from London, than in the neighbourhood of it, because there is so great a variety of lands within ten miles round London, which have been so long dressed and cultivated, that a supply of earth fit for all sorts of plants may be easily procured; but in some places which are at a distance from large towns, it is very difficult to procure a quantity of earth proper for the choicer sorts of flowers and plants; therefore the composts will require more care, and should be mixed a considerable time longer before they are used, that they may have the advantage of heat and cold to soften and improve them; and should be frequently turned over, that the parts may be well mixed and incorporated, and the clods well broken and divided. Almost every one who has written upon this subject has directed the procuring the upper surface of earth from a pasture ground, as one of the principal ingredients in most composts for plants; which is certainly a very good one, provided it has time to incorporate before it is used: for if this be mixed up hastily, and put into pots or tubs before it has had a winter's frost, and summer's heat, to loosen the parts effectually, it will unite and cake together so hard as to starve the plants that are put into it. For all earth, when put into pots or tubs, is much more apt to bind than when it is in beds; therefore it should be in proportion made looser, according to the nature of the plants for which it is designed, than when it is intended for beds or borders. So that if this earth from a pasture cannot be prepared and mixed at least one year before it is used, it will be much better to take the earth of a kitchen-garden which has been well wrought and dunged; but this should be clear from all roots of trees and bad weeds. If this earth be well mixed with the other composts six months, and often turned over, it will be better for pots and tubs than the other will in twice that time. This earth, being the principal ingredient in those composts designed for such plants as require a rich soil; the next is to have a quantity of very rotten dung, from old hot-beds; or for those plants which delight in a cool soil, a quantity of rotten cow-dung is preferable. The proportion of this must be according to the quality of the earth; for if that be poor, there should be one third part of dung; but if it be rich, a fourth part or less will be sufficient. These, when well incorporated, and the parts divided, will require no other mixture, unless the earth be inclinable to bind, in which case it will be proper to add some sand, or sea-coal ashes, to it: if sea-sand can be procured, that is best, and the next to it is drift-sand; but the sand procured from pits is by no means proper. The proportion of this must be according to the nature of the earth, for if that be stiff there must be a greater proportion used, but this should not exceed a fifth part, unless it is very strong, in which case it will require more, and a longer time to lie, and must be often turned over before it is used. The next compost, which is designed for plants which do not require so good earth, and naturally grown on loose soils, should be half of the beforementioned earth from a pasture, or that from a kitchen-garden; and if these are inclinable to bind, there should be a third part sand, the other part rotten tan, which will be of great use to keep the parts divided, and let the moisture pass off. The composition for most of the succulent plants, is prepared with the following materials: the earth from a common, where it is light, taken on the surface, one half, the other half sea or drift sand, and old lime-rubbish screened, of equal parts; these, well-mixed, and often turned over, form the best of all composts for the very succulent plants. The other sort of compost, which is designed for plants that delight in a very loose, light, rich earth, should be made of light earth, taken from a kitchen-garden which has been well dunged and thoroughly wrought, like those near London, one half; of rotten tanner's bark, one-third; and the other part mud from the scouring of ditches, or from the bottom of ponds where the soil is fat; but this mud should lie exposed in small heaps a whole year, and be often turned over, before it is mixed with the other, and afterwards frequently turned and mixed for eight months or a year, before it is used. In all mixtures, where rotten wood may be required, if the rotten tanner's bark, taken from old hot-beds, be used, that will answer every purpose of the other: and wherever sand is necessary in any compost, the sea-sand should always be preferred to all other; but this should not be used fresh, because the salts should be exposed to the air, which will loosen the particles, and thereby render them better adapted to the nutriment of vegetables. There are some who have directed the use of rotten leaves of vegetables as an excellent ingredient in most composts; but they are of little use, and contain the least quantity of vegetable pasture of any kind of dressing. Others, who never had any experience in the culture of plants, have directed different composts for almost every plant; and these composts consist of such a variety of ingredients as greatly to resemble the prescriptions of a quack doctor: no person conversant in the business of gardening, could commit such gross absurdities, for it is well known that a few different composts will be sufficient for all the known plants in the world. Those who pretend to give direction for the culture of plants from theory only, begin at the wrong end; for the true knowledge of gardening or agriculture must be from experience. In making any compost, great care should be had that the several parts are properly mixed together; not to have too much of any one sort: therefore when three or four several sorts are to be mixed together, there should be a man or two placed to each sort, in proportion to the quantity; for if two parts of any one sort are requisite to be added, there should be two men put to that, and but one to each of the other: and these men must be instructed carefully to spread each sort in such a manner over the other, as that they may be exactly mixed together. Another thing which should be observed is, never to lay these composts in too large heaps; but rather continue them

in length, laying them up in a ridge, so that the sun and air may more easily penetrate through it; and as these composts should, if possible, be made a year before they are used, they should be frequently turned over; which will prevent the growth of weeds, and expose every part of the heap equally to the sun and air: and the more they are exposed to the influence of these, the better they will be prepared for vegetation.—*Field Composts*, are usually made, by mixing various substances with stable or yard dung: and hence in some counties they are called Mixens. The most common materials for this purpose are, turf pared from waste places, virgin earth, peat earth, lime, the scourings of brooks, ponds, and ditches, weeds, rubbish of buildings, coal-ashes, &c. That dung alone, properly managed and applied, is a most valuable manure, is unquestionable; yet it is not equally useful in all soils and situations. It is much better calculated for active than inactive soils. On limestone, chalk, &c. it meets with abundance of active materials; but upon clays, deep loams, &c. it operates best in conjunction with lime, or some other stimulating substance. When dung is intended for a compost, no attempt should be made to add a large quantity of lime, earth, &c. till it is properly fermented; every addition of this kind checking the fermentation. The lime, earth, &c. should be added after the fermentation is finished; and the whole then carefully mixed and laid up together. In a few days, a second fermentation will come on; and if the mixture has been properly turned over, and thoroughly incorporated, it will be fit for use in a month or six weeks. Some judgment and attention will be requisite, with regard to the quantity of lime and other active principles employed: for if the quantity employed be small, their action upon the rich substances in the dung will be partial and imperfect; and if too great, a considerable loss may be sustained by their over-action. If the quantity of earth also be such as to press the dung too hard, the air will be excluded, and the second fermentation be impeded or prevented. It is certainly a right method to lay a good coat of earth as a foundation for the dunghill, into which the moisture of the dung may soak down: and it is no bad way to make a heap of such substances as can be readily obtained, apart from the dung; and to throw the moisture of the dunghill, and the urine of the cattle, over it. The following is a good method of making a compost: in a field conveniently situated, plough and harrow a head-land, till the soil is well divided and in fine tilth; then take a cart-load, or forty bushels of lime, fresh from the kiln, and place it in little heaps, about a bushel in each, along the middle of the head-land, at four feet distance from each other: cover the heaps with four or five times their quantity of pulverized earth, and pat it down close with the back of a shovel, so as to exclude both rain and air. In a few days the moisture of the earth will have dissolved the lime, and reduced it to a powder. If the heaps have any fissures in them, they should from time to time be filled up, by having more earth thrown upon them, and patted down close. When the lime is perfectly reduced to a powder, that and the earth must be chopped down with a spade, and intimately blended together. This is most conveniently done, in the form of a long bank or ridge; in the middle of which, a large furrow or opening must be made, sufficient to receive five cart-loads, of forty bushels each, of good spit dung; when the earth and lime must be thrown over the dung, so as to cover the whole. In this manner it must lie some months, or till the dung is in a state of dissolution; when it must be turned over again, well mixed, and formed into a heap or clamp, to be kept for use. Earth, lime, and dung, thus managed, constitute an unctuous mass, of great fertility. An effectual mode of raising a large quantity of compost manure is, to bed the farm-yard about two feet deep with earth; and on this, to cleanse the stables, cow-houses, hog-sties, &c. and to move the cribs, in which loose cattle are fed with straw, about it. This bed of earth will retain the urine; so that when the whole is mixed together, it will all be nearly of equal goodness, and admirably adapted to gravelly and loose soils in general; through which the essence of dung alone will be washed in one season: a top-dressing of soot, pigeons'-dung, &c. will last but one crop; and very rotten pure dung is little better. Another method of making compost dunghills is, by making them into clamps. Make a layer of hedge-earth, from a grubbed border, two feet deep, and about twelve feet square, in the beginning of November: the quantity of earth will be about twenty-six loads, of sixteen bushels each: on this clean all the yards and sheds. The yard, not being bedded with earth, should be well littered, to soak up the urine, and to be made into dung by the hogs and loose cattle: this may be cleaned once a fortnight, and the sheds once a week; and piled regularly on the foundation of earth, until the heap is about seven feet high; and when one clamp is thus filled up, another foundation of earth may be laid adjoining. In order to enrich the compost, the flowings of the heap should be prevented from running off, and thrown up occasionally on the heap. By thus piling the compost in clamps, it will be in very good order for arable land early in the spring: which will not be the case, if it be left to be trodden flat over the whole yard, and every particle to be washed by the rain. Fermentation goes on much quicker in this method; and it would be better still, if the heap were made under a roof, to keep off all moisture but what is thrown up. Another advantage of this method is, that any part of the compost may be used, by taking a division of the hill that has been the longest finished. Where there is a deficiency of materials for making good composts proper for the soil, in many cases a mixture of different soils may answer the purpose. Thus, where clay predominates, the addition of sand, where it is happily within reach, is often sufficient to ensure fertility; and where sand prevails, the addition of clay or chalk will answer the same purpose. Gravel enriches peat-moss; and that in return improves gravel. The farmer, therefore, should search every where above ground, and below, for such substances as may improve his several soils, by a due mixture.——Top-dressings, answer particularly well on crops that tiller, as Wheat and Barley; and when these are sickly and backward in the spring, in consequence of a bad seed-time, immoderate wet, severe frosts, and other causes, help them prodigiously, by quickening their vegetation; and thus enabling them to cover the soil from the ensuing drought of summer. They are peculiarly applicable to poor, light, sandy and gravelly, or limestone lands. The advocates for top-dressings, in preference to ploughing in manure, assert, that when a considerable quantity of dung is laid upon land, and mixed with the whole soil, a great proportion of its richest salts may be carried down by rains; and not only be lost to the present crop, but if the sub-soil be of a loose and porous nature, will very soon escape beneath the reach of the plough; whereas, if stable-dung, and other enriching manures, were mixed with lime, or other active substances, into a compost, and thus employed as a top-dressing, a much smaller quantity than is usually applied might probably be found sufficient. By thus laying manures upon or near the surface, they sink by slow degrees; their beneficial effects are exerted upon the crop in their passage downwards; and very little, if any, of the fertilizing parts penetrate beyond where they are useful. Top-dressings, however, are frequently attended with great expense:

their effects also are not permanent; and in dry seasons they do little or no good. In applying them, the nourishment of the plants only is considered; no regard being had to loosening the earth: they are not, therefore, sufficient for heavy lands. Stiff loams and clay require lime and dung, to break the cohesion of their parts. Beans also, and tap-rooted plants, in general require such manures as are worked into the land by the plough: for top-dressings operate but a little way within the surface, except on thin soils, where they certainly are of great use; and are also beneficial to Turnips, by pushing the young plant hastily into rough leaf, and thereby securing it against the fly; but they are of no farther utility. ——Folding. This is resorted to by all open field farmers, as the preparation for Wheat; and their chief dependence is upon this species of top-dressing, where the quantity of farm-yard dung is insufficient for their purpose. This mode of manuring is peculiarly adapted to farms of considerable extent of hill or common pasture, or grass-lands that never come under the plough. In such farms, by bringing the sheep in the evening to the fold, a considerable quantity of manure will be made, that would otherwise be lost. If the pasture, upon which the sheep feed through the day, be good, they may be folded, without much detriment to the animal, for a great part of the year: but where the pasture is scanty, this cannot well be done; for the sheep will not be able to pick up a sufficiency of food through the day, to enable them to bear the fatigue of travelling to and from the fold, and fasting all night. And unless the sheep have turnips or hay during the winter, their dung will be of small value. It is a bad practice to crowd more sheep into a fold than can lie down at their ease; and it is equally bad to confine young and old, strong and weak, in the same fold. It is far better to afford them room enough, and to let them remain on the same spot two or three nights, till it be sufficiently manured. Feeding sheep in a fold can only be practised on light dry soils. Here it is still more necessary, neither to crowd the stock, nor to put in the weak with the strong: for they will tread down and waste the food; and in the contention for it, the strong will deprive the weak of their proper share. On light dry soils, sheep will do good, by giving it cohesion with much treading; but on clays or strong loams this does much injury to the land: turnips, &c. cannot therefore be fed off in such soils, except in dry seasons; but must be pulled and eaten upon a dry stubble or pasture. If folding be supposed necessary on account of the manure, where farm-yard dung is not made in a sufficient quantity, and other manure is not readily to be obtained; might not a greater stock of muck be raised, by littering a dry part of the yard, or a warm corner of some pasture, with straw, fern, or whatever litter could be had in greatest plenty? penning them there in hard weather, and letting them run into the adjacent pasture only during the day in fine weather. A great quantity of manure might thus be raised in winter from a flock; and, provided they had ample room in the pen, and were to be well supplied with dry litter, the sheep might sustain less injury in thus lying warm and dry, than from being folded on naked land, often wet, and in an open exposure.——To conclude,—"The doctrine of the proper application of Manures from organized substances," says Sir Humphrey Davy, "offers an illustration of an important part of the economy of nature, and of the happy order in which it is arranged. The death and decay of animal substances tend to resolve organized forms into chemical constituents; and the pernicious effluvia disengaged in the process, seem to point out the propriety of burying them in the soil, where they are fitted to become the food of vegetables. The fermentation and putrefaction of organized substances in the free atmosphere, are noxious processes: beneath the surface of the ground, they are salutary operations. In this case, the food of plants is prepared where it can be used; and that which would offend the senses, and injure the health, if exposed, is converted, by gradual processes, into forms of beauty and of usefulness; the fetid gas is rendered a constituent of the aroma of the flower; and what might be poison, becomes nourishment to animals, and to man."

Mappia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, permanent; parts roundish, concave, coloured within. *Corolla:* petals five, roundish, having claws, spreading, scarcely larger than the calix. *Stamina:* filamenta numerous, (sixty,) capillary, broader at the tip, the length of the corolla, inserted into the receptacle; antheræ ovate. *Pistil:* germen globular, superior; style columnar, incurved, permanent; stigma capitate. *Pericarp:* berry ovate, one-celled. *Seed:* single, ovate, large, involved in a thick viscid aril. Essential Character. *Calix:* five-parted. *Corolla:* five-petalled. *Germen:* superior. *Berry:* one-seeded. *Seed:* arilled.——The only known species is,

1. Mappia Guianensis. This is a shrub, with branches full of little turbercles, ramping over trees to their very tops, and dividing into many alternate branchlets, which are long, and hang down; upon these are alternate leaves, smooth, thick, and narrowing at the base, six inches long, and half that wide, petioled; flowers in little bunches; corolla white; berry red, the size of a cherry; the skin fleshy, firm, slightly acid.—Native of Guiana, on the banks of the river of Sinemari; flowering and fruiting in May.

Maranta; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* perianth three-leaved, lanceolate, small, superior. *Corolla:* one-petalled, ringent; tube oblong, compressed, oblique, bent in; border six-cleft; alternate outer segments ovate, equal, smaller; one of these the lowest, two the uppermost; two alternate lateral very large, roundish, representing the lower lip; uppermost small, two-parted. *Stamina:* filamentum membranaceous, resembling a segment of the corolla; antheræ linear, fastened to one edge of the filamentum. *Pistil:* germen roundish, inferior; style simple, the length of the corolla; stigma obsoletely three-cornered, bent in. *Pericarp:* capsule roundish, obsoletely three-cornered, three-celled, three-valved. *Seed:* single, ovate, wrinkled, hard. Essential Character. *Calix:* three-leaved. *Corolla:* trifid. *Nectary:* three-parted, the third part bearing the antheræ on its upper side.—The generic or natural character of Maranta, is given differently from Schreber's, as above, by Swartz, in his observations.—*Calix:* perianth three-leaved, superior; leaflets lanceolate, longer than the tube of the corolla, contiguous. *Corolla:* one-petalled, ringent; tube cylindric, compressed, oblique, gibbous; border trifid; divisions equal, lanceolate-ovate, one lowest, two lateral; nectary three-parted, connate with the tube; two lower divisions oblong, lateral, larger, representing a lower lip; the third upper larger, vaulted, serving for a filamentum. *Stamina:* filamentum none; antheræ linear, fastened to the upper edge of one of the segments of the nectary; the rest as before, except that the style is crooked in the middle.——The species are,

1. Maranta Arundinacea; *Indian Arrow-Root.* Culm branched, herbaceous; leaves ovate-lanceolate, somewhat hairy underneath. This has a thick, fleshy, creeping root, which is very full of knots; from which arise many smooth leaves, standing upon reed-like footstalks, which arise immediately from the roots: between these come out the stalks,

near too feet high, having at each joint a leaf. The ends of the stalks are terminated by a bunch of small white flowers. It is called Arrow-root, from its curing wounds inflicted by poisoned arrows. The roots being washed, and pounded in wooden mortars, and macerated in water, yield a flour of a snowy whiteness, which no worms will touch: made into a jelly with boiling water, it is a most cordial and nourishing food, that will remain on the stomach when nothing else will; and a pudding made of it is most excellent for convalescents. It is also used for starch, which is far superior in quality to that made of wheat flour, one pound being equal to two pounds and a half of that prepared from wheat. Its medical virtues are astringent, cordial, diaphoretic, and said by Dr. Barham to be in some degree an emmenagogue: a decoction of the fresh roots makes an excellent ptisan or cooling drink in acute diseases. When prepared with milk for children, if it ferment on the stomach, the addition of a little animal jelly will prevent it. The fresh expressed juice of the root with water, is a powerful antidote to vegetable poisons, such as the Savanna flower, taken inwardly; the bruised root, outwardly applied, is a cure for the wounds of poisoned arrows, scorpions, or black spiders; and arrests the progress of gangrene. It is made for sale in considerable quantities in the West Indies, for about a dollar per pound. It has thriven in America, in the states of South Carolina and Georgia, and produced 1840 pounds per acre; and perhaps would be well worth attention in the East Indies. —Native of South America. This, with the other plants of this genus, are very tender; and therefore will not live in this climate, unless they are preserved in stoves. They may be propagated by their creeping roots, which should be parted in the middle of March, just before they begin to push out new leaves. These roots should be planted in pots filled with light rich earth, and plunged into a moderate hot-bed of tanner's bark, observing now and then to refresh them with water; which must not be administered to them in large quantities, as it would rot the roots in an inactive state. Where they are constantly kept in the tanner's bark, and have proper air and moisture, they will thrive.

2. Maranta Galanga. Culm simple; raceme terminating, loose, with alternate flowers; lip of the nectary emarginate; leaves lanceolate.—Native of South America.

3. Maranta Tonchat. Stem branched, shrubby, perennial; leaves elliptic-ovate, smooth; flowers panicled.—Native of the East Indies, Cochin-china, the Island of Cayenne, and Guiana, where it is used for making baskets.

4. Maranta Malaccensis. Culm simple; leaves oblong, petioled, silky, pubescent underneath.—This is a doubtful plant. Mr. Roscoe refers it to *Alpinia*.

5. Maranta Comosa. Stemless: scape spiked, comose; leaflets of the coma reflex.—Native of Surinam.

Marattia; a genus of the class Cryptogamia, order Filices. Essential Character. Capsules oval, gaping longitudinally at top, with seven cells on each side.——The species are,

1. Marattia Alata. Rachises scaly, the partial ones winged; leaflets sharply serrate; frond bipinnate, with the pinnas generally opposite.—Native of Jamaica.

2. Marattia Lævis. Rachises even, the partial ones winged; leaflets bluntly serrate at top, the uppermost confluent; frond subtripinnate, with the lower pinnas alternate.—Native of St. Domingo.

3. Marattia Fraxinea. Rachises even, simple; leaflets lanceolate, serrate, all distinct. This is a very hard fern, with a handsome leaf, like that of the ash; frond unequally bipinnate, with the pinnas alternate.—Native of the Mauritius.

4. Marattia Salicina. Frond simply pinnate; stalk smooth, simple, two feet long; leaflets alternate, stalked, linear, very slightly crenate, with several points. Capsules excessively numerous, forming a close row on each side of the leaflet.—Native of New South Wales.

Marcgravia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth six-leaved, imbricate, permanent; leaflets roundish, concave, the two outmost larger. *Corolla:* one-petalled, conic-ovate, entire, closed like a calyptre, parting at the base, caducous. *Stamina:* filamenta very many, awl-shaped, short, spreading, deciduous; antheræ upright, large, ovate-oblong. *Pistil:* germen ovate; style none; stigma headed, permanent. *Pericarp:* berry coriaceous, globular, many-celled, many-valved. *Seeds:* numerous, small, oblong, nestling in soft pulp. Essential Character. *Corolla:* one-petalled, calyptre-shaped. *Calix:* six-leaved, imbricate. *Berry:* many-celled, many-seeded.——The only known species is,

1. Marcgravia Umbellata. This is a shrubby creeping plant, but not properly parasitical.—Native of the West Indies, in the cool woody mountains. Browne says, it is frequent in the woods of Jamaica; and appears in such various forms, that it has been mistaken for different plants, in the different stages of its growth.

Marchantia; a genus of the class Cryptogamia, order Hepaticæ. Essential Character. *Male. Calix:* salver-shaped; antheræ numerous, annulated, imbedded in its disk. *Female. Calix:* peltate, flowering on the under side. *Capsules:* deflexed, opening at top. *Seeds:* fixed to elastic fibres.—Seven species of this genus are enumerated in the *Systema Vegetabilium*. Five of them are natives of Britain. Maranta Polymorpha is very common in wet places; as on shady walls, and by the sides of wells and springs. In figure it somewhat resembles an oak-leaf. The peduncles are in the angles of the lobes, from one to three inches high; capsules greenish, dividing into eight or ten segments; on the upper surface are here and there glass-shaped conical cups, on short pedicels, with a wide scalloped margin, and inclosing about four little bodies, very finely serrated at the edges. Mr. John Lindsay, surgeon, in Jamaica, sowed that part of the fructification of this Alga composed of fine elastic filamenta and small globules, heretofore considered as the male parts, where none of the plants had ever been seen before; and in a short time raised several young Marchantiæ, which grew freely.

Margaritaria: a genus of the class Diœcia, order Octandria.—Generic Character. *Male. Calix:* perianth one-leafed, four-toothed, minute, permanent. *Corolla:* petals four, roundish, inserted into the calix. *Stamina:* filamenta eight, bristle-shaped, patulous, longer, inserted into the receptacle; antheræ roundish, small. *Pistil:* germen superior, roundish; style bristle-shaped, the length of the stamina; stigma blunt. *Female:* on a distinct individual. *Calix:* as in the male, permanent. *Corolla:* as in the male. *Pistil:* germen superior, globular; styles four or five, filiform; stigmas simple, permanent. *Pericarp:* berry globular, crowned with short patulous styles. *Seed:* aril four or five grained, four or five celled, cartilaginous, very shining; with two-valved lobes; seeds ovate, compressed inwards. Essential Character. *Male. Calix:* four-toothed. *Corolla:* four-petalled. *Female. Calix* and *Corolla:* as in the male. *Styles:* four or five. *Berry:* cartilaginous, four or five grained.——The only known species is,

1. Margaritaria Nobilis. In the male, the branches are round, brachiate, flexuose; leaves opposite: in the female, branches alternate; leaves alternate.—Grows in Surinam.

Marica; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* spathes bivalve. *Corolla:* six-parted; petals, three outer ovate, three inner smaller, all connate at the claws. *Stamina:* filamenta three, very short, inserted into the tube of the corolla; antheræ oblong, erect. *Pistil:* germen inferior, angular; style three-cornered; stigmas three, petal-form, simple, acute. *Pericarp:* capsule oblong, angular, three-celled. *Seeds:* several, angular. Essential Character. *Corolla:* six-parted, with three alternate segments as small again as the others. *Stigma:* petal-form, trifid, with the three divisions simple, acute. *Capsule:* three-celled, inferior.——The species are,

1. Marica Northiana. Stalk sword-shaped, winged.—Native of Brazil.

2. Marica Paludosa. Root a fleshy bulb, covered with several membranes as in Saffron; stem stout, with two leaves at the top. It flowers in August.—Native of the moist meadows of Guiana, at the foot of the mountain Courou.

Marigold. See *Calendula.*

Marigold, Marsh. See *Caltha.*

Marigold, African and *French.* See *Tagetes.*

Marigold, Fig. See *Mesembryanthemum.*

Marila; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved; leaflets oblong, blunt, spreading. *Corolla:* petals five, obovate, waved at the edge, spreading, longer than the calix. *Stamina:* filamenta very numerous, inserted into the receptacle, a little connate at the base, filiform, the inner ones the same length with the corolla, the outer gradually shorter; antheræ ovate. *Pistil:* germen linear, four-cornered, superior; style short, thick; stigma blunt, subcapitate. *Pericarp:* capsule subcolumnar, incurved, four-cornered, four-celled, four-valved. *Seeds:* very numerous, like saw-dust, ciliate. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Capsule:* four-celled, many-seeded. *Stigma:* simple.——The only species is,

1. Marila Racemosa.—Native of the West Indies.

Marjoram. See *Origanum.*

Marrubium; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, salver-shaped, rigid, ten-streaked; mouth equal, patulous, often ten-toothed; toothlets alternate, smaller. *Corolla:* one-petalled, ringent; tube cylindrical; border gaping, with a long tubular opening; upper lip erect, linear, bifid, acute; lower reflex, broader, half three-cleft; the middle segment broader, emarginate; the lateral ones acute. *Stamina:* filamenta four, shorter than the corolla, concealed beneath the upper lip, two longer; antheræ simple. *Pistil:* germen four-cleft; style filiform, of the same length, and in the same situation with the stamina; stigma bifid. *Pericarp:* none; calix contracted at the neck, spread out at the mouth, inclosing the seeds. *Seeds:* four, somewhat oblong. Essential Character. *Calix:* salver-shaped, rigid, ten-streaked. *Corolla:* upper lip bifid, linear, straight. Most of the plants of this genus are easily propagated by seeds, which should be sown on a bed of poor earth in the spring; and when the plants come up, they must be kept clean from weeds; and where they are too close, they should be thinned, leaving them a foot and half asunder, that their branches may have room to spread: after this, they require no other culture. They may also be propagated by cuttings, in the same manner as the tenth and eleventh species. If these plants are upon a dry poor soil, they will live several years; but in rich land, they seldom last above three or four.——The species are,

* *With five-toothed Calices.*

1. Marrubium Alyssum; *Plaited-leaved White Horehound.* Leaves wedge-shaped, five-toothed, plaited; whorls without any involucre. Root biennial; stems about eighteen inches high; flowers large, of a dark purple colour. It flowers in July and August.—Native of Spain and Italy.

2. Marrubium Peregrinum. Leaves ovate-lanceolate, serrate; toothlets of the calices bristle-shaped; stems nearly three feet high, branching much more than the common sort.—Native of the Levant, Austria, Sicily, &c.

3. Marrubium Candidissimum; *Woolly White Horehound.* Leaves subovate, woolly, emarginate, crenate at top; calicine toothlets awl-shaped. This has stalks about a foot to a foot and half high; flowers at the end of the stem and branches, in close whorls, white. It flowers from July to September.—Native of the Levant.

4. Marrubium Astracanicum. Leaves ovate, crenate, tomentose, very much wrinkled; calicine teeth awl-shaped; upper segments of the corolla acute. Stems several, perennial, half a foot high, branched and procumbent.—Native of Astracan; flowering in May.

5. Marrubium Supinum; *Procumbent White Horehound.* Calicine teeth bristle-shaped, straight, villose. Stems seldom above eight or nine inches long, covered with a soft hoary down. It flowers from August to October.—Native of Spain and the south of Europe.

** *With ten-teethed Calices.*

6. Marrubium Vulgare; *Common White Horehound.* Teeth of the calix bristle-shaped, hooked. Root perennial; the whole plant white with down; stems upright, a foot or eighteen inches high, branching towards the top; whorls very close, consisting of 40 or 50 sessile flowers; corolla small, white, compressed. The whole plant is bitterish, and has a strong, but not altogether unpleasant, smell. It was a famous medicine, with the ancients, for obstructions of the viscera; and, taken in large doses, operates as a gentle purgative: it is likewise a principal ingredient in the negro Cæsar's antidote for vegetable poisons. A young man, says Linneus, who had occasion to take mercurial medicines, was brought into a salivation, which continued for more than twelve months; and every means tried to remove it only served to make the complaint worse: at length an infusion of this plant was ordered him; by the use of which, he got well in a very short time. A strong decoction of the young tops, boiled into a thin syrup with honey, is an excellent medicine for colds, coughs of long standing, hoarseness, and all other disorders of the breast and lungs. The leaves, dried and reduced to powder, are supposed to destroy worms in the stomach and intestines. Two or three ounces of the juice taken frequently for a dose, is efficacious in menstrual obstructions, and all other disorders which proceed from a thick viscid state of the fluids, or obstructions of the viscera. A drachm of the dried leaves, or an infusion of a handful of the green leaves, is a sufficient dose.—Native of most parts of Europe, by road sides, and in waste places; flowering from June to September.

7. Marrubium Africanum; *African White Horehound.* Leaves cordate, roundish, emarginate, crenate. Root perennial. Stem two feet high, upright, subtomentose, deeply grooved on the opposite sides. It flowers from July to September.—Native of the Cape.

8. Marrubium Crispum; *Curled White Horehound.* Leaves cordate, roundish, crenate, subdentate; calices ten-toothed, awnless. Stem suffruticose, upright, rough-haired.—Native of Italy, Sicily, and Spain.

9. Marrubium Hispanicum; *Spanish White Horehound.* Borders of the calices spreading; toothlets acute. Stalks more erect than those of the common sort; the whole plant very hairy.—Native of Spain.

10. Marrubium Pseudo-dictamnus; *Shrubby White Horehound.* Borders of the calices flat, villose; leaves cordate, concave; stem shrubby, two feet high, dividing into many branches; flowers white.—Native of the island of Candia. The whole of this plant is very hoary, with a dense compact cotton. Both it and the next make an agreeable variety when intermixed with other plants: but as they seldom produce seeds in England, they must be propagated by cuttings, planted in a shady border in April. They are rather tender; and in very severe winters are killed, unless they are screened from the hard frosts: especially those plants which grow in good ground, where, becoming luxuriant in summer, their branches are more replete with juice, and very liable to suffer by cold: but when they are in a poor dry rubbish, the roots being short, firm, and dry, are seldom injured by cold, and will continue much longer than those in better ground.

11. Marrubium Acetabulosum; *Saucer-leaved White Horehound.* Borders of the calices longer than the tube, membranaceous; the greater angles rounded. Stems hairy, about two feet high; whorls large; corolla small, pale purple.—Native of the island of Candia. See the preceding species.

Marsdenia; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* perianth inferior, of one leaf, in five acute equal segments, rather small, permanent. *Corolla:* of one petal, pitcher-shaped, or nearly wheel-shaped, in five bluntish segments; crown of the stamens of five compressed simple undivided leaves, without any internal teeth. *Stamina:* filamenta five, broad, flat, cloven at the top; antheræ sessile on the inside of the filament, of two separate cells, terminated by a common membrane; masses of pollen projected from the antheræ upon the stigma in pairs, erect, sticking by their base. *Pistil:* germens two, superior, ovate; styles combined, very short; stigma single, generally simple. *Pericarp:* follicles two, ovate oblong, smooth. *Seeds:* numerous, imbricated, comose.——The species are,

1. Marsdenia Velutina. Stem twining; leaves heart-shaped, broadly ovate, pointed, downy, and soft; cymes umbel-shaped; mouth of the flower naked.—Found in the tropical part of New Holland.

2. Marsdenia Tinctoria. Stem twining; leaves heart-shaped, ovate-oblong, pointed, nearly smooth, glandular in their fore-part; tufts lateral; mouth of the flower bearded. This plant is said to afford the best indigo in Sumatra.—Native of Sumatra.

3. Marsdenia Clausa. Stem twining; leaves lanceolate, acute at each end, smooth, slightly rugose on the upper side; mouth of the flower densely bearded.—Found in Jamaica.

Three other species of Marsdenia are described by Brown, found growing in New Holland.

Marsh Cinquefoil. See *Comarum.*

Marsh Mallow. See *Althæa.*

Marsh Marigold. See *Caltha.*

Marsh Trefoil. See *Menyanthes.*

Marsilea; a genus of the class Cryptogamia, order Miscellaneæ.—Generic Character. *Calix:* common oval, subcompressed, coriaceous, hairy, gaping at the base, internally divided into several (fourteen or fifteen) cells, in two longitudinal rows, separated by a membranaceous partition. *Corolla:* none. *Stamina:* filamenta none; antheræ several, inserted round each pistil, very small, obovate, sharp below, one-celled, gaping transversely, exploding a spherical pollen. *Pistil:* in each cell several, co-ordinate in a transverse row, oval; style none; stigma short, blunt. *Pericarp:* none. *Seeds:* as many as there are pistilla. *Receptacle:* membrane somewhat fleshy, clothing the cells internally.——The species are,

1. Marsilea Natans. Leaves opposite, simple; branches floating.—Native of Italy, in stagnant and slow-flowing marsh ditches, as near Pisa; also in North America.

2. Marsilea Quadrifolia. Leaves in fours, quite entire; stem creeping, rooting.—Native of the south of Europe, as well as in New South Wales, in watery places.

3. Marsilea Minuta. Leaves wedge-shaped, toothletted.—Native of the East Indies.

4. Marsilea Hirsuta. Leaflets wedge-shaped; somewhat rounded, nearly entire, hairy, as well as the footstalks; fruit nearly sessile.—Found in New Holland.

5. Marsilea Angustifolia. Leaflets lanceolate, somewhat toothed at the extremity; smooth when full grown.—Found in New Holland.

Martynia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth five-cleft, unequal, shrivelling. *Corolla:* one-petalled, bell-shaped; tube spreading, ventricose, gibbous below at the base, melliferous; border five-cleft, obtuse, spreading; segment almost equal, the lower straight, the lowest more erect, concave, crenate. *Stamina:* filamenta four, filiform, curved inwards; the rudiment of a fifth filamentum within the upper pair of stamina, short, like a cusp; antheræ connected, converging. *Pistil:* germen oblong; style short, simple, the length of stamina; stigma two-lobed. *Pericarp:* capsule woody, oblong, gibbous, quadrangular, two-furrowed on each side, acuminate, with the tip bent back, opening two ways, four or five celled, inclosing the seeds, as in a four-celled nucleus. *Seeds:* several, oblong, berried. Essential Character. *Calix:* five-cleft. *Corolla:* ringent. *Capsule:* woody, corticate, with a hooked beak, four-celled, two-valved.——The species are,

1. Martynia Perennis; *Perennial Martynia.* Stem simple; leaves serrate. Root perennial, thick, fleshy, divided into scaly knots, somewhat like those of Toothwort; stems annual, about a foot high, thick, succulent, purplish.—Native of Carthagena, in New Spain. This species dies to the root every winter, and rises again the succeeding spring: it must be constantly preserved in the bark-stove, and plunged into the bark-bed; otherwise it will not thrive in this country. During the winter season, when the plants are decayed, they should have but little water; as at that time it will rot the roots. In the middle of March, just before the plants begin to shoot, is the proper season to transplant and part the roots; when they should be transplanted into middle-sized pots, filled with a light rich earth, and then plunged into the bark-bed, which, at this time, ought to be renewed with some fresh tan. When the plants come up, they should be frequently refreshed with water; and as the warmth of the season increases, it will be proper to admit a large share of fresh air.

2. Martynia Longiflora; *Long-flowered Martynia.* Stem simple; leaves roundish, repand; tube of the corolla gibbous at the base, and flatted.—Native of the Cape of Good Hope. This, and the three following species, must be propagated by seeds, sown in pots filled with light rich earth, and plunged into a hot-bed of tanner's bark; where, if the earth be duly watered, the plants will appear in three weeks or a month: transplant them in a little time after they come up, each into a separate pot, and plunge them into the hot-bed again, watering them well, and shading them, until they have taken new root; after which, they should have a large share of fresh air admitted to them in warm weather, by raising the glasses of the hot-bed every day: with this management, the plants will make great progress, so as to fill the pots with their roots in about a month or six weeks' time; when they should be shifted into pots, about a foot diameter at the top, filled with light

rich earth, and then plunged into the hot-bed in the bark-stove; where they should be allowed room, because they put out many side-branches, and will grow three feet high or more, according to the warmth of the bed.

3. Martynia Diandra; *Two-stamined Martynia.* Branches dichotomous; leaves cordate-orbicular, toothed; flowers two-stamined. This is a large handsome plant, two feet high; stem single, round, reddish-green; corolla inferior, five times the length of the calix; tube white, tinged with purple, and spotted red and yellow. Miller says, the corolla is shaped like the Fox-glove, but of a paler purple-colour. The flowers at the divisions of the branches may be brought forward in July; those at the extremities come afterwards: so that there is a succession of flowers on the same plant till October, when the plants decay. This has been much confounded with the fifth species.—Native of La Vera Cruz, in New Spain. See the preceding species.

4. Martynia Craniolaria; *White-flowered Martynia.* Branches dichotomous; leaves half five-lobed; calix with a one-leafed spathe. See *Craniolaria*, which is the same plant.

5. Martynia Proboscidea; *Hairy Martynia.* Stem branched; leaves quite entire, cordate; sinuses dilated. This is a large plant, two feet high, flexuose, herbaceous, villose, viscid; root-leaves none. It flowers from June to August.—Native of America.

6. Martynia Fruticosa; *Shrubby Martynia.* Shrubby: leaves lanceolate-serrate, toothed; upper lip of the corolla with numerous curled segments. This plant belongs to the genus *Gesneria;* which see.

Marvel of Peru. See *Mirabilis.*

Massonia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* petals six, lanceolate, spreading, upright, placed externally on the nectary; which is inferior, cylindrical, membranaceous, six-streaked, six-toothed. *Stamina:* six, filiform, incurved, a little longer than the petals, inserted into the teeth of the nectary; antheræ ovate, upright, yellow. *Pistil:* germen superior (in respect of the nectary); style awl-shaped, declining, the length of the stamina; stigma simple, acute. *Pericarp:* capsule three-sided, thickening above, obtuse, smooth, three-celled, three-valved, opening longitudinally at the corners. *Seeds:* very many, angular, globular, smooth. Essential Character. *Corolla:* inferior, with a six-parted border; filamentum on the neck of the tube. *Capsule:* three-winged, three-celled, many-seeded.——The species, (which are all propagated like *Hæmanthus,*) are,

1. Massonia Latifolia; *Broad-leaved Massonia.* Leaves roundish, smooth, spreading; segments of the corolla spreading.—Native of the Cape.

2. Massonia Angustifolia; *Narrow-leaved Massonia.* Leaves lanceolate, smooth, upright; segments of the corolla reflex.—Native of the Cape.

3. Massonia Undulata; *Wave-leaved Massonia.* Leaves lanceolate, waved, smooth.—Native of the Cape.

4. Massonia Echinata; *Rough-leaved Massonia.* Leaves ovate, muricated, hairy.—Native of the Cape.

There are four other species, Prickly-leaved, Shagreen-leaved, Few-flowered, and Trumpet-flowered Massonia, all natives of the Cape.

Masterwort. See *Astrantia* and *Imperatoria.*

Mastic Tree. See *Pistacia Lentiscus.*

Mat, Garden; a kind of coarse mat or covering formed of bass, which is much used in gardening for sheltering various sorts of plants in winter and spring, during cold and frosty weather; and in summer, for shading many sorts of young or tender kinds occasionally from the sun; besides being used for many other purposes in the different garden compartments. They are found to differ greatly in regard to size and substance, there being small, middling, and large sizes; but for general use, those called Russia mats are superior, both in dimensions, substance, and durability. It may also be proper to have some of the smaller or middling sizes for particular occasions, and small gardens; in which, for some purposes, they may be more convenient than large ones. They were sold formerly by most of the principal nursery and seedsmen at from six to eight, twelve, or fifteen shillings the dozen, according to size and strength; but for some years past the prices have been much higher. These mats also are of essential use in all hot-bed works, for covering or spreading over the lights or glasses of the frames in the nights, in winter and spring, to exclude the external night cold; also occasionally in the day-time, in very severe weather, and heavy falls of snow or rain: and likewise for occasionally covering several sorts of small young esculent plants, in the full ground, in beds and borders, in these seasons; as young Lettuces, Cauliflowers, small salad herbs, early Radishes, &c. in the open beds, and under frames and hand-glasses, to defend them from cutting frosts, snow, and other inclement weather; and sometimes in raising, transplanting, or pricking out small or moderate portions of particular sorts of plants, both of the hardy and tender kinds, whether of the esculent or annual flowery kinds in the spring, on beds or borders of natural earth, or in hot-beds without frames, by being arched over with hoops or rods. They are likewise extremely useful in spring and summer, in hot, dry, sunny weather, for shading several sorts, both in seed-beds before and after the young plants are come up, and in beds of pricked out small young plants, to shade them from the sun till they take fresh root; as also for shading the glasses of hot-beds occasionally, when the sun is too powerful for particular sorts of plants in the heat of the day, as in Cucumbers, Melons, and various other kinds. For kitchen and other garden districts furnished with wall trees, they are of great use in spring, to cover the seeds of particular sorts when in blossom, and when the young fruit is setting and advancing in its early growth, after the decay and fall of the bloom; by which assistance, in cold winters and springs, when sharp frosts sometimes prevail, a tolerable good crop is often saved, while in trees fully exposed the whole is cut off by the severity of the weather. In the flower-garden, and pleasure-ground, they are also found useful on different occasions: in the former, in sheltering beds of curious sorts of choice flower plants, both in their advancing growth, and to protect them from cold in winter and spring; and when in full bloom, to shade and screen the flowers from sun and rain, to preserve their beauty more effectually, and to continue them longer in blow of a fine lively appearance, as well as to cover beds, &c. in raising various tender annual plants from seed in the spring: and in the latter, occasionally in winter to defend some kinds of curious evergreens, &c. such as some of the Magnolias, broad-leaved Myrtle, Olive, Tea-tree, &c. when standing detached, and trained against walls and other places. And, besides, in nurseries they are of considerable utility in the propagation and culture of numerous sorts of tender exotics; in defending them from cold, and shading from scorching sun, while they are in their minor growth, &c. They are necessary also in tying round bundles or baskets of tender or curious plants, when conveyed to a distance. They are also occasionally of great use, in severe winters, on such glass-works as green-houses, hot-houses, forcing-frames, &c. in covering the glasses alternately in the nights, and occasionally in the day-time. In using them when the seeds are open or loose, they should be secured

by tying the end threads or strings of the bass close and firm; otherwise they will soon ravel out loose in that part, and are spoiled. Where they are used for covering and shading, when wetted by rain or snow, they should be spread across some rail-hedge or fence to dry, before folded together; without which, they will soon rot, and cannot last long.

Mat Grass. See *Nardus.*

Matricaria; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common hemispherical; scales linear, imbricate, almost equal, not scariose. *Corolla:* compound radiate; corollets hermaphrodite, tubular, numerous, in a hemispherical disk; females in the ray, several; proper of the hermaphrodite funnel-form, five-cleft, spreading; female oblong, three-toothed. *Stamina:* to the hermaphrodites, filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* to the hermaphrodites, germen oblong, naked; style filiform, the length of the stamina; stigma bifid, spreading; to the females, germen naked; style filiform, almost the length of the hermaphrodite; stigmas two, revolute. *Pericarp:* none; calix unchanged. *Seeds:* solitary, oblong, without any pappus or down, to both sorts of florets. *Receptacle:* naked, convex. Essential Character. *Calix:* hemispherical, imbricate; the marginal scales solid, sharpish. *Down:* none. *Receptacle:* naked.——The species are,

1. Matricaria Parthenium; *Common Feverfew.* Leaves compound, flat; leaflets ovate, gashed; peduncles branched. Root biennial or perennial, composed of a great number of fibres, and spreading wide on every side; stem from two to three feet high, erect, firm, round, striated, slightly hairy, branched on every side; flowering-heads solitary, sometimes on simple, but oftener on branched peduncles. The whole plant has a strong, and, to most persons, an unpleasant smell, and a bitter taste. It yields an essential oil by distillation; and has always been esteemed a good emmenagogue. It is also serviceable in hysteric complaints. The best way of taking it is, a slight infusion. The expressed juice is said to kill worms in the bowels: and it has been recommended as a febrifuge; whence the English name Feverfew. It is an agreeable carminative and bitter, strengthening the stomach, and dispersing flatulencies. Mr. Miller enumerates the following varieties of this plant:—1. With very double flowers. 2. With double flowers, having the florets of the ray plane; of the disk, fistular. 3. With very small rays. 4. With very short fistular florets. 5. With naked heads, having no rays. 6. With naked sulphur-coloured heads. 7. With elegant curled leaves. They flower in June, and ripen seeds in autumn.—Native of many parts of Europe, in waste places, under hedges and walls, in church-yards, sometimes in cornfields, in gardens, where it is also cultivated in a double state. The Germans call it *Mutterkraut, Mutterkamille, Fieberkraut,* &c. the Dutch, *Moederkruid;* the Danes, *Moderurt;* the Swedes, *Matram;* the French, *Matricaire, Espargoutte;* the Italians, Spaniards, and Portuguese, *Matricaria;* and the Russians, *Matoschnaja Trawa.*—This plant is frequently cultivated in the physic gardens near London, to supply the market. Some of the varieties are pretty constant, if care be taken in saving the seeds; but where these are suffered to scatter, it is almost impossible to preserve the varieties without mixture. The seeds should be sown in March, upon a bed of light earth, and, when they are come up, they should be transplanted out into nursery-beds, at about eight inches asunder; where they may remain till the middle of May, when they may be taken up, with a ball of earth to their roots, and planted in the middle of large borders, where they will flower in July and August, and, if the autumn be favourable, will produce ripe seeds the same year. But it is not advisable to permit them to seed; which often weakens and decays the roots: therefore, when their flowers are past, you should cut down their stems, which will cause them to push out fresh heads, whereby the roots may be maintained. When the different varieties of these plants are intermixed with other plants of the same growth, they make a handsome appearance during the season of flowering; which commonly continues a full month, or more. But as their roots seldom abide more than two, or at most three years, fresh plants should be raised from seeds to supply their places; but as the second variety seldom produces good seeds, it must be propagated by planting cuttings, or parting their roots, in the spring or summer months.

2. Matricaria Maritima; *Sea Feverfew.* Receptacles hemispherical; leaves bipinnate, somewhat fleshy, convex above, keeled underneath. The stalks of this plant branch out pretty much, and spread near the ground; root woody, running deep, apparently perennial; flowers white, several on a stem. In smell it approaches to the true Chamomile, but is much weaker, and grows so luxuriantly in gardens, as to seem a different species.—Native of the sea-coast of Britain; flowering in July. It is seldom cultivated, except in botanic gardens. Sow the seeds of this, and the next, in autumn, soon after they are ripe, or in the spring, upon a bed of common earth, in almost any situation: when the plants come up, thin them where they are too close, and clear them from weeds.

3. Matricaria Suaveolens; *Sweet Feverfew.* Receptacles conical; rays bent down; calicine scales equal at the edge. Some think this a mere variety of the next species. The scent is sweet and pleasant; and it resembles the *Anthemis Nobilis,* in its qualities. The Finlanders use an infusion of it in consumptive cases. Cows, goats, and sheep, eat it; horses are not partial to it, and swine wholly refuse it. It flowers from May to August.—Native of Siberia, Germany, Sweden, and Great Britain.

4. Matricaria Chamomilla; *Corn Feverfew.* Receptacles conical; rays spreading; calicine scales equal at the edge. Root annual; stem green, striated, smooth, branched; flowering heads solitary. Mr. Curtis remarks, that the florets begin to hang down in the evening, and continue to do so till morning, both in this and *Anthemis Cotula,* which it resembles most of all the many plants with which it is confounded, under the common name of *Mayweed, Maithes,* or *Dog-Fennel.* It differs, however, from the Stinking Mayweed, by its scent, for the heads of its flowers, bruised, smell like the real Chamomile, only not so pleasant; but those of the Stinking Mayweed are very disagreeable, and the plant will blister the skin on being much handled. It is a common weed among slovenly cultivators of arable land.

5. Matricaria Argentea; *Silvery-leaved Feverfew.* Leaves bipinnate; peduncles solitary. Stem a foot high; leaves of a silver colour; flower white.—Native of the Levant.

6. Matricaria Asteroides; *Starwort-flowered Feverfew.* Leaves lanceolate, entire, smooth, oblique. It is the same with *Boltonia Asteroides;* which see.—Sow the seeds in autumn soon after they are ripe, in the full ground; and when the plants are fit to remove, if they are planted in the borders of the flower-garden, they will continue some years without protection, and annually produce flowers and seeds.

7. Matricaria Prostrata. Leaves simple, ovate, toothed; peduncles lateral, one-flowered; branches decumbent.—Native of Curaçao.

8. Matricaria Cantoniensis. Lower leaves serrate, uppermost quite entire; peduncles one-flowered; florets of the ray entire; receptacle convex.—Native of China, near Canton.

Matthiola; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth cylindric, quite entire, erect, short, permanent. *Corolla:* petal one, very long, from a slender tube ending gradually in an entire border, with a repand mouth. *Stamina:* filamenta five, awl-shaped, shorter than the corolla; antheræ simple. *Pistil:* germen globular, inferior; style filiform, the length of the corolla; stigma thickish, blunt. *Pericarp:* drupe globular, crowned with the calix, one-celled. *Seeds:* nut globular; nucleus globular. Essential Character. *Calix:* entire. *Corolla:* tubular, superior, undivided. *Drupe:* with a globular nucleus.——The only species is,

1. Matthiola Scabra. This tree rests on the authority of Plumier, and requires farther inquiry before any thing can be determined about it.—Found in the West Indies.

Mattuschkæa; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth four-parted; segments ovate, acute, villose. *Corolla:* one-petalled; tube long; border four-cleft. *Stamina:* filamenta four, almost equal, the length of the segments of the corolla; antheræ roundish. *Pistil:* germen superior, four-cleft; style filiform; stigma simple. *Pericarp:* none. *Seeds:* two or four, very small, naked. Essential Character. *Calix:* four-parted, with linear leaflets. *Corolla:* one-petalled, with a long tube, and four-cleft border. *Germen:* superior, four-cleft. *Seeds:* four, naked.——The only known species is,

1. Mattuschkæa Hirsuta. Stem filiform, erect, frequently quite simple, hirsute, as is the whole plant, especially the calix; flowers in a terminating sessile head, the size of a pea. —Native of Guiana.

Maudlin. See *Achillea.*

Maurandia; a genus of the class Didynamia, order Angiospermia. Essential Character. *Calix:* inferior, in five deep segments. *Corolla:* ringent; tube bell-shaped, furrowed. *Capsule:* of two cells, opening by five teeth at their summit. —There is but one species,

1. Maurandia Semperflorens; *Bastard Foxglove.*—It is a native of Mexico, and an elegant greenhouse plant, flowering for months together in the summer. The flowers are of a beautiful lilac, or purple and white colour. Root perennial.

Mauritia; a genus of the class Diœcia, order Hexandria. —Generic Character. *Male Flowers:* in an oblong sessile ament, covered all round with flowers closely approximating, with blunt scales between the flowers. *Calix:* perianth one-leafed, cup-shaped, truncated, entire, three-sided, short. *Corolla:* one-petalled; tube short, the length of the calix; border three-parted; segments equal, spreading, a little lanceolate, rigid, apparently woody, blunt. *Stamina:* filamenta six, inserted into the throat of the tube, thick, very short; antheræ linear, angular, the length of the segments of the corolla; three alternate ones extended between the segments of the corolla, and horizontal; the three others erect, pressed close to the channel of the segments. *Female Flowers:* unknown. Essential Character. *Male Flowers:* in an oblong sessile ament. *Calix:* one-leafed, cup-shaped, entire. *Corolla:* one-petalled, with a short tube, and a three-parted border. *Filamenta:* six.——The only known species is,

1. Mauritia Flexuosa. This is a singular tree, almost without leaves; branches angular, flexuose, smooth, with short joints, thickening upwards, somewhat recurved, terminated by embracing sheaths, with a cup-shaped and sharper knee-joint.—Native of the woods of Surinam.

May Apple. See *Podophyllum.*

May Lily. See *Convallaria.*

Mays. See *Zea.*

May-weed. See *Anthemis, Cotula,* and *Matricaria.*

Maywort. See *Artemisia.*

Meadows.—Under this title all pasture-land is commonly comprehended, or at least all grass-land which is mown for hay. By this appellation we shall distinguish such land as is too moist for cattle to graze upon in winter, being generally too wet to admit heavy cattle, without poaching and spoiling the sward; and for those grass-lands which are drier, we refer the reader to the article *Pasture,* p. 254. There are two sorts of meadows in England, one of which is styled Water Meadows, and the other are simply called Meadows. Water Meadows are those which lie contiguous to rivers or brooks, from whence the water can be carried to overflow the grass at pleasure. Of these there are large tracts in several parts of England, which, if skilfully managed, would become much more profitable to their owners than they are at present: for nothing can be more absurd than the common practice of plowing these low grounds all the winter, whereby the roots of all the sweetest kinds of grass are destroyed, and those only left, which, being natives of marshes, are sour and coarse. If cultivators were curious to examine the herbage of these water meadows, they would find the bulk of them composed of bad weeds, such as grow by the sides of rivers, brooks, and ditches, of which the several sorts of docks make no small share; and although many of these produce a great burden of what the country people call hay, yet it is only fit for cows, cart-horses, and other animals which by hard labour and hunger are driven to eat it. After the grass is mown off these meadows, and cattle turned in to graze, how common is it to see the land almost covered with these rank weeds, the seeds of which ripen in autumn, and, falling into the water, are carried by the stream, and deposited on the flowed land, where they grow, and fill the ground in every part: but so incurious are the generality of farmers in this respect, that if the ground be but well covered, they care not what it is, few of them ever taking any pains to weed or clean their pastures. The best method for the management of these meadows is, never to flow them till the middle or latter end of March, excepting once or twice in winter, when there may happen floods, bringing down a great deal of soil from the upper lands; at which times it will be of great service to let water upon the meadows, that the soil may settle there; but the sooner the wet is drained off when this is lodged, the greater advantage the meadows will receive by it; but from the end of March to the middle of May, in dry seasons, by frequently letting on the water, the growth of the grass will be greatly encouraged; and at this season there will be no danger of destroying the roots of the grass; and after the hay is carried off the ground, if the season should prove dry, it will be of great service to the grass if the meadows are flowed again; but when this is practised, no cattle should be turned in till the surface of the ground is become firm enough to bear their weight without poaching the land, for otherwise the grass will suffer more from the treading of the cattle, than it will receive benefit by the flowing: but these are things which the country people seldom regard; so that the meadows are generally very unsightly, and rendered less profitable. These meadows should be weeded twice a year; the first time in April, and again in October; at which times, if the roots of docks, and all bad weeds, are cut up with a spaddle, the meadows will soon be cleared of this trumpery, and the herbage greatly improved. Another great improvement of these lands might be procured by rolling them with a heavy roller in spring and autumn. This will press the surface of the ground even, whereby it may be mown much closer, and it will also sweeten the grass; and this piece of husbandry is of more service to pastures than most people are aware.——Watering *of* Meadows. There being no

part of the kingdom where the system of watering meadows is so well understood, and carried to so great perfection, as in Wiltshire, the account of that practice, as delivered by Mr. Thomas Davis, in his general View of the Agriculture of that country, drawn up for the Board of Agriculture, is here subjoined.—Many of the most valuable and best-formed meadows were made at the beginning of this century. An imperfect scheme of watering had been practised before that period; but the regular mode in which this system, as connected with sheepfolding, is now conducted, is not more ancient. At present there is scarcely a river or brook in the district, that is not applied to this purpose. It has been always observed, that winter floods produce fertility, provided the water does not remain too long on the land. But it is the taking off the water, and bringing it on again at will, that is the great business of irrigation; and thus making a water meadow a hot-bed for grass. The knowledge of the proper time and manner of doing this, is the result of observation. Provided this great object can be accomplished, namely, the bringing on and carrying off the water at pleasure, it is not material what the shape of a water-meadow is, or that the disposition of the trenches should be uniform. But as very little land can be entirely commanded by water, unless its inequalities are reduced by manual labour, it has been found expedient to adopt two different kinds of water-meadows; one for land lying on declivities, and which must in general be watered from springs or small brooks, and the other for low lands near rivers, to be watered from those rivers. The first kind is called in Wiltshire *Catch-work Meadows*, and the latter *Flowing Meadows*, which are by far the most general in this district. To elucidate the distinction between the two kinds of meadow, and to give some idea what are the situations in which they may be introduced, it may be necessary to remark that the Catch-work meadow is made by turning a spring or small stream along the side of a hill, and thereby watering the land between the New Cut, or, as it is provincially termed, Main Carriage, and the original water-course, which now becomes the main drain. This is sometimes done, in particular instances, merely by making the New Cut level, and stopping it at the end, so that when it is full, the water may run out at the side, and flood the land below. But as the water would soon cease to run out equally for any great length, and would wash the land out in gutters, it has been found necessary to cut small parallel trenches or carriages, at distances of twenty or thirty feet, to catch the water again: and each of these being likewise stopt at its end, lets the water over its side, and distributes it until it is caught by the next, and so on over all the intermediate beds, to the *main drain* at the bottom of the meadow, which receives the water, and carries it on to water another meadow below, or, if it can be so contrived, another part of the same meadow on a lower level. To draw the water out of these parallel trenches or carriages, and lay the intermediate beds dry, a narrow deep drain crosses them at right angles, at about every nine or ten poles length, and leads them from the main carriage at top, to the main drain at the bottom of the meadow. When this meadow is to be watered, the ends of the carriages adjoining the cross-drains are stopt with turf dug on the spot, and the water is thrown over as much of the meadow as it will *cover well* at a time, which the watermen call a *pitch of work;* and when it is necessary to lay this pitch dry, they take out the turves, and let the water into drains, and proceed to water another pitch. This kind of water-meadow is seldom expensive: the stream of water being usually small and manageable, few *hatches* are necessary; and the land lying on a declivity, much less manual labour is required to throw the water over it regularly, and particularly to get it off again, than it the flowing meadows. The expense of making such a meadow is usually from three to five pounds per acre; the improvement frequently from fifteen shillings an acre to at least forty. The annual expense of keeping up the works, and watering the meadow, which is usually done by the acre, seldom amounts to seven and sixpence per acre.—The *Flowing Meadows* require much more labour and system in their formation. The land applicable to this purpose being frequently a flat morass, the first object to be considered is how water is to be *got off* when it is brought on; and in such situations this can seldom be done, without throwing up the land in high ridges, with deep drains between them. A main carriage being then taken out of the river at a higher level, so as to command the tops of these ridges, the water is carried by small trenches or carriages along the top of each ridge, and by means of moveable stops of earth is thrown over on each side, and received in the drains below, from whence it is connected into a main drain, and carried on to water other meadows, or lower parts of the same meadow. One tier of these ridges being usually watered at once, is commonly called a pitch of work. The ridges are commonly made thirty or forty feet wide, or, if water be abundant, perhaps sixty feet, and nine or ten poles in length, or longer, according to the strength and plenty of the water. It is obvious from this description, that as the water in this kind of meadow, is not used again and again in *one pitch*, as in the catch-meadows, that this meadow is only applicable to large streams, or to valleys subject to floods; and as these ridges must be formed by *manual labour*, the expense of this kind of meadow must necessarily exceed the more simple method first described: and the hatches that are necessary to manage and temper the water on rivers, must be much more expensive than those on small brooks. The expense therefore of the first making of such a meadow as this, will be from twelve pounds to twenty pounds per acre, according to the difficulty of the ground, and the quantity of hatch-work required: but the improvement in the value of the land by this operation is astonishing. The *abstract value* of a good meadow of this kind may fairly be called three pounds per acre; but its value when taken as *part of a farm*, and particularly of a *sheep-breeding farm*, is almost beyond computation: and when such a meadow is once made, it may be said to be made for ever, the whole expense of keeping up the works, and watering it frequently, not exceeding five shillings per acre yearly, and the expense of the hatches, if well done at first, being a mere trifle for a number of years afterwards. It has been alleged by those who know very little of water-meadows, that they render the country unwholesome, by making the water stagnant. Daily observation proves the fact to be otherwise in Wiltshire; and the reason is obvious. It has been already said that a water-meadow is a hot-bed for grass; the action of the water on the land excites a *fermentation;* that fermentation would certainly in time end in a *putrefaction;* but the moment putrefaction begins, vegetation ends. Every farmer knows the commencement of this putrefaction, by the scum the water leaves on the land; and if the water is not then instantly taken off, the grass will rot, and the meadow be spoiled for the season. The very principle of water-meadows will not permit water to be stagnant in a water-meadow country; it must be always kept in action, to be of any service; besides, many of the best water-meadows were, in their original state, a stagnant unwholesome morass. The draining such land, and making it so firm, that the water may be taken off at will, must con-

tribute to the healthiness of the country, instead of injuring it. We are frequently asked, how it comes to pass, that although water-meadows are so useful, as to be almost indispensable in South Wiltshire, yet in other counties, where they are not known, the want of them is not felt; nay, that there are even in this district many parishes who have none, and even breed lambs without them? To this, says Mr. Davis, I answer, that the fair question is not how do other countries do without them, but how would the farmers of this district, who are happy enough to have water-meadows, pursue their present system of sheep-breeding, if those meadows were taken away? A system which I do not hesitate to say, is more profitable to themselves, their landlords, and the community at large, than any other that could be substituted in its room; and perhaps this question cannot be answered better, than by exhibiting the contrast between those who have water-meadows, and those who have none, in the same district. Every farmer who keeps a flock of sheep, and particularly a breeding flock, in so cold and late-springing a district as South Wilts, knows and feels the consequences of the month of April; that month between hay and grass, in which he who has not water-meadow for his ewes and lambs, frequently has nothing. The ewes will bring a very good lamb with hay only: perhaps a few turnips are preserved for the lambs, which in a very favourable season may last them through March; but if they are then obliged to go to hay again, the ewes shrink their milk, the lambs pinch and get stinted, and the best summer food will not recover them. To prevent this, recourse is had to feeding the grass off those dry meadows that are intended for hay, the young clovers, and frequently the young wheat, in fact, every thing that is green. And who will pretend to estimate what is the loss that a farmer suffers by this expedient? The ray-grass, on the exposed parts of this district, is seldom a bite for the sheep till near May-day. If the season should permit any turnips to be kept till that time, which can seldom be depended upon, they are not only of little nourishment to the stock, but they exhaust the land so as to prejudice the succeeding crop. And it ought to be remarked by the way, that in many parts of this district, the soil is not at all favourable to the production of turnips. It therefore necessarily follows, that a farmer, under these circumstances, has no certain resource, to support his stock during this month, but hay; and even in that he is sometimes disappointed, by having been obliged, in the preceding spring, to feed off the land which he had laid out for a hay-crop: he is then obliged to buy hay, and that frequently at the distance of many miles. And, to add to his distress at this critical time, his young ewes are then brought home from wintering, to be kept nearly a month on hay alone. In this month, which so often ruins the crops, and exhausts the pockets of those sheep-breeding farmers who have no water-meadows, the water-mead farmers may be truly said to be "in clover." They train up their dry meadows early, so as almost to insure a crop of hay; they get their turnips fed off *in time* to sow barley, and have the vast advantage of a rich fold to manure it. They save a *month's hay*, and have no occasion to touch their field grass, till there is a good bite for their sheep: and their lambs are as forward at *May-day*, as those of their less lucky neighbours are at *Midsummer:* and after all, they are almost certain of a crop of hay on their water-meadows, let the season be what it will.——MANAGEMENT OF WATER-MEADOW. As soon as the after-grass is eaten off as bare as can be, the manager of the mead, provincially called the *drowner*, begins cleaning out the main drain, then the main carriage, and then proceeds to right up the works, that is, to make good all the water-carriages that the cattle have trodden down, and open all the drains they may have trodden in, so as to have one tier ar pitch of work ready for drowning; and which is then put under water (if water is plenty enough) during the time the drowners are righting up the next pitch. In the flowing meadows, this work is or ought to be done early enough in the autumn, to have the whole mead ready to catch *the first floods* after Michaelmas, the water being then thick and good, being the *first* washing of the arable land, on the sides of the chalk hills, as well as of the dirt from the roads. The length of this autumn watering cannot always be determined, as it depends on situations and circumstances; but if water can be commanded in plenty, the rule is to give it a thorough good soaking, at first perhaps of a fortnight or three weeks, with a dry interval of a day or two, and sometimes two fortnights, with a dry interval of a week, and then the works are made as dry as possible, to encourage the growth of the grass. This first soaking is to make the land sink and pitch close together; a circumstance of great consequence, not only to the *quantity*, but the *quality* of the grass, and particularly to favour the shooting of the new roots which the grass is continually forming, to support the forced growth above. While the grass grows freely, a fresh watering is not wanted; but as soon as it flags, the watering may be repeated for a few days at a time, whenever there is an opportunity of getting water; always keeping this fundamental rule in view, *to make the meadows as dry as possible between every watering*, and *to stop the water the moment the appearance of any scum on the land shews that it has already had water enough.* Some meadows that will bear the water three weeks in October, November, or December, will perhaps not bear it a week in February or March, and sometimes scarcely two days in April or May. In the catch-meadows watered by springs, the great object is to keep the works of them as dry as possible between the intervals of watering; and as such situations are seldon affected by floods, and generally have too little water, care is necessary to make the most of the water by catching and rousing it as often as possible; and as the top-works of every tier or pitch will be liable to get more of the water than those lower down, care should be taken to give to the latter a longer time, so as to make them as equal as possible. It has been already said, that the great object in this district of an early crop of water-meadow grass, is to enable the farmer to breed early lambs. As soon as the lambs are able to travel with the ewes, perhaps about the middle of March, they begin to feed on the water meadows. Care is or ought to be taken, to make the meadows as dry as possible for some days before the sheep are let in. The grass is hurdled out daily in portions, according to what the number of sheep can eat in a day, to prevent their trampling the rest; at the same time leaving a few open spaces in the hurdles, for the lambs to get through and feed forward in the fresh grass. One acre of good grass will suffice five hundred couples for one day. On account of the quickness of this grass, it is not usual to allow the ewes and lambs to go into it with empty bellies; at least not before the dew is off in the morning. The hours of feeding are usually from ten or eleven o'clock in the morning till four or five in the evening, when the sheep are driven to fold, being generally at that time of the year on the barley fallow; and the great object is to have water-mead grass sufficient for the ewes and lambs till the barley sowing is ended. As soon as this first crop of grass is eaten off by the ewes and lambs, the water is immediately thrown over the meadows, (at this time of the year, two or three days over each pitch is generally sufficient,) and it is then made perfectly dry, and laid up for

a hay-crop: six weeks are usually sufficient for the growth of the crop; it seldom requires eight; and there have been instances of great crops being produced in five. The hay of water-meadows being frequently large and coarse in its nature, it is necessary to cut it young; if made well, it then becomes of a peculiarly nourishing milky quality, either for ewes or dairy cows. The water-meadows are laid up for a second crop in some instances; but this is only usual when hay is scarce: not that it is supposed to hurt the land, but the hay is of that herbaceous soft nature, and takes so long time in drying, that it is seldom well made. It is usually of much greater value to be fed with dairy cows, and for that purpose a flush of after-grass, so early and so rank, will be precisely of the same comparative service to the dairy, as the spring feed has been described to be for ewes and lambs. The cows remain in the meadow till the drowner begins to prepare for the winter watering. Water-meadows are reckoned to be perfectly safe for sheep in the spring, even upon land that would rot sheep, if it was not watered; but in the autumn the best water-meadows are supposed to be dangerous. But the circumstance is rather an advantage than a disadvantage to this district, as it obliges the farmers *to keep a few dairy cows*, to feed the water-meadows in autumn, and to provide artificial grasses, or other green crops, for their sheep during that period. From what has been so repeatedly urged, on the necessity of making water-meadows *dry*, as well as wet, every reader must have inferred the advantage of having them, if possible, on a warm absorbent bottom. The bottom or subsoil of a water-mead, is of much more consequence than the quality or the depth of the top soil; not but the lands on peaty or clay bottoms may be considerably improved by watering; and there are many good water-meadows on such soils, but they are not so desirable, on account of the difficulty of draining the water out of them, and making them firm enough to bear treading. A loose gravel, or, what perhaps is still better, a bed of broken flints, with little or no intermixture of earth, wherever it can be obtained, is the most desirable bottom. As to those meadows which cannot be flowed, there should be the same care taken to weed and roll them as the water-meadows; as also never to let heavy cattle graze upon them in winter when they are wet, for the cattle will then poach them, and greatly injure the grass; therefore these should be fed down as soon as possible in the autumn, before the heavy rains fall to render the ground soft; and those pastures which are drier, may be kept to supply the want of these in winter; and where there are not cattle enough to eat down the grass in time, it will be much better to cut off what is left, than to suffer it to rot upon the ground, for that will prevent the grass from shooting early in the spring; but where people have not cattle enough of their own to eat down the grass in time, they had much better take in some of their neighbours', than suffer their fog, as it is called, to remain all the winter. When these meadows are fed in the autumn, the greater variety of animals are turned in, the closer they will eat the grass; and the closer it is eaten, the better the grass will come up the following spring; and if during the time the cattle are feeding, the meadows be well rolled, the animals will eat the grass much closer than they otherwise would. Those persons who are best skilled in this part of husbandry, always dress their meadows every other, or at least every third year, without which it is vain to expect any good crop of hay; but the generality of the farmers are so much distressed for dressing to supply their corn-land, as not to have any to spare for their meadows; they are therefore content with what the land will naturally produce, rather than take any part of their manure from their arable ground. But this is a very imprudent piece of husbandry, for if land is to be annually mown for hay, it cannot be supposed that it will produce a good crop long, unless proper dressings are allowed it; and when land is once beggared for want of manure, it will be some years before it can be recovered again. See *Pasture*. The scouring of ditches, mud of ponds, and almost any earth, form good dressings for meadow lands, if suffered to lie, and well turned over. These, together with alternate mowing and feeding, will in general keep meadows in heart, without robbing the arable land.——DRAINING. The draining of land is another great improvement, for though meadows which can be overflowed produce a much greater quantity of herbage, yet where the wet lies too long upon the ground, the grass will be sour and coarse, and so overrun with rushes and flags as to be of small value. Cold stiff clays are most liable to this, where the water cannot penetrate, but is contained as in a dish; so that the wet which it receives in winter continues till the heat of the sun exhales it. The method of draining such lands is to cut several drains across them where the water lodges; and from these cross-drains to make others, to carry off the water to ponds, brooks, or rivers, in the lower parts of them. These drains need not be made very large, unless the ground be very low, and so situated as not to be near any outlet; in which case large ditches should be dug at proper distances, in the lowest part of the ground to contain the water; and the earth which comes out of these ditches, should be spread on the land to raise the surface. But where the water can be conveniently carried off, under-ground drains should be made at proper distances, which may empty themselves into the large ditches. The usual method of making under-ground drains, is to dig trenches, and fill the bottoms with stones, bricks, rushes, or bushes; covering them over with the earth dug out of the trenches. But when there is a flood, these drains are often stopped by the soil which the water brings down. The best method of making these drains is, to dig the principal ones three feet wide at top, sloping them down for two feet in depth, where there should be a small bank left on each side, upon which cross-stakes or bearers should be laid; and below this set-off, an open drain should be left, at least one foot deep, and ten or eleven inches wide. Smaller drains of six or seven inches wide, and the hollow under the bushes eight or nine inches deep, should be cut across the ground, to discharge the water into the large drains. The number and situation of these must be in proportion to the wetness of the land, and the depth of earth above the bushes must be proportioned to the intended use of it; for if the land is to be ploughed, the drain must not be shallower than fourteen inches, but for meadow land, one foot will be enough: for when the bushes lie too deep in strong land, they will have little effect, the ground above binding so hard as to detain the wet on the surface. The drains being dug, the larger sticks of the brush-wood should be cut out, to pieces of sixteen or eighteen inches in length, to lay across upon the side-banks of the drain, at about four inches' distance; and the smaller brush-wood, furze, broom, heath, &c. should be laid lengthwise pretty close over these, with rushes, flags, &c. on the top of them, and then the earth to cover the whole. Such drains will continue good many years, and the water will find an easy passage through them. Where there is plenty of brush-wood, they are made at an easy expense; but where brush-wood is scarce, they are very chargeable. In this case cuttings of willow or black poplar might be planted in moist places, which would furnish brush-wood for this purpose in four or five years. In countries where there is plenty of stone,

that is the best material for under-ground drains; for when these are properly made, they will never want repairing. The best time for making these drains is about Michaelmas, before the heavy rains of autumn fall; because the land being then dry, the drains may be dug to a proper depth. When the drains are finished, and the water carried off the land, pare off the rushes, flags, &c. lay them in heaps to rot, and they will afford manure. Plough the ground to destroy the roots of noxious weeds; and if it be laid fallow for one season, and ploughed two or three times, it will greatly mend the land. Spread the rotten rushes and flags over it, and sow grass seeds. Some persons burn the rubbish that is pared off the land, and spread the ashes. When bricks are used for drains, if the ground be soft and spungy, the bottom of the drain is laid with the bricks placed across; tiles or slates will answer the purpose. Over these, on each side, two bricks are laid flat, one upon the other: this is covered with bricks laid flat. The bricks should be ten inches long, four broad, and three thick; but this work is too expensive, unless a drawback might be allowed from the heavy tax upon the material. When the bottom of the trench is firm and solid in clay or marl, no bricks need be laid in the bottom: the sides are then formed by placing one brick edgewise, instead of two laid flat. This is much cheaper, and in such land equally durable. Double bricks, with a hollow drain through the middle, form a good drain, which is laid very expeditiously. Where stone is plentiful and near at hand, no material is superior to it for this purpose. These drains are in general made larger than those with brick, the bottom being at least eight inches wide. In Wiltshire their stone drains are in general ten or twelve inches in width, with perpendicular sides. Sometimes the stones are so placed as to leave a water-course at bottom, by setting two flat stones triangularly, to meet at the points; but it is a better way to cover the bottom with a flat stone, and then to put three other flat stones, upright, leaving the water to find its way between them; in both cases filling up the residue of the drain to the top, or near it, with loose stones. Where only small round stones can be got, the drain may be made taper, from nine inches at top to nothing at bottom, and about three feet deep; filling it up with the small stones first, and finishing with a thin turf at top. Where gravel is more plentiful, it is found to answer the purpose very well, if screened or washed. In all cases, the general opinion is, that those drains last longest, which have the least or narrowest waterway left at bottom; the force of the water being then sufficient to clear away any little obstacles. Where none of the above materials are to be had, there is still another sort of covered drain, which may be adopted in a stiff tenacious soil. This is made with turfs or sods, and, besides being the cheapest, is as lasting as any, where the land is sufficiently cohesive. The inverted turf is either put upon a shoulder, leaving a hollow part under it, and the remainder of the drain is filled up with the earth that came out of it; or the drain is cut out in a wedge, or the form of the letter V, and when the earth is taken out, six or eight inches of the bottom part of the wedge are cut off, and the remainder is filled up. If a few rushes were put round the bottom of this wedge, so as to keep the lower part from dropping, and the ends of the rushes were drawn upwards, between the sides of the drain and the wedge, it would be an improvement. Care must be taken to keep off all cattle till these drains have had time to settle. The entrances should have a fence of brick or stone to secure them. Their aperture at top should be eighteen inches, their depths thirty inches. The strength with which the sods are supported, and their depth in the ground being at least twelve inches, will effectually prevent their removal by any weight on the surface; and secure them from all effects of the weather. When a bog or morass is to be drained, the direction in which the trench is to be dug is first to be ascertained. This is the most difficult part of the whole business, and cannot be fully understood but from much practice. The following rules, however, may be of service: 1. The whole depending upon the nature of the bog to be drained, and the state of he adjacent country, the neighbouring strata must be ascertained as far as possible whether they be of stone, gravel, sand, or marl; for the water must be lodged in one of these, and it is necessary to ascertain in which. 2. The trench must be directed so as to fall in with the bottom of the bed which occasions the mischief, and the particular spot where the main spring lies. One spring may probably occasion the whole bog, which, having no proper vent, forces the water through many small veins, even to a great distance, making the whole a swamp. By draining the main spring, the others follow of course. 3. If there are various beds through which water issues, stone is to be preferred for draining the whole; the water being much more easily drawn through that, than through gravel, sand, and marl; consequently by draining the spring there, the whole water which communicates therewith flows to it, water always preferring a straight or clear to a crooked channel. But in stone beds, the trench ought to be made from six or eight yards from the tail of the bed, or the place where the rock ends, because in limestone, and other rocks, the tail is harder than any other part of the rock, and there are few, if any, fissures in it; but by going a few yards above, you get into a softer part of the bed, and the water is more accessible. The tail of these beds may often be found at a point or promontory jutting out from the adjacent heights. 4. The trench in general should be directed in a line with the bottom of the hill, because it makes the best separation between the upland and the meadow inclosures, and the spring can best be intercepted. The trench, however, must be carried in the line of the spring, or near it; for if it diverges from it any distance, all prospect of reaching the spring, by tapping or otherwise, is lost. 5. It is better to make a new trench, than to tap the spring in any old brook or run of water, where that may be practicable; for though the spring, when once it bursts out, has force enough to throw up any stones, sand, &c. that may accidentally fall into it, yet brooks in a flood may bring down such immense quantities as completely to choak up the spring; and so much caution is necessary to prevent any risk of such a circumstance, that when the trench crosses any runlet of water proceeding from a small brook, or from a collection of surface water, the trench is puddled so as to receive it, lest it should blow up, and destroy the works. Lastly, the general line of direction being fixed on, and the trench marked out, begin at the bottom, or lowest level, carrying the trench gradually up, under the guidance of the spirit level: a few inches fall in a hundred yards will be sufficient. In digging the trench, no tools but those of the common sort are made use of; and common labourers can carry it on, under an experienced foreman or overseer. The auger, which must often be used for tapping the spring, may be from an inch and half to two inches diameter, and is applied in the ordinary manner: if, in boring, a stone be met with, the auger must be taken off, and a chisel or punch screwed on, to penetrate so hard a substance. Sometimes the spring is cut off by the trench alone; but in many cases it lies greatly below the level of the trench, and then it is necessary to use the auger for tapping the spring. The trench being made, and the

spring cut off, either by tapping or otherwise, it is then necessary to determine whether the drain should be open or covered. If it can at the same time be made a fence, it had better be open; if not, it should be covered. No apprehension need be entertained of the holes made by the auger being filled up, in either case, unless other waters be admitted; because such is the force of the spring, that it will throw up any stones, earth, or other substances, that might accidentally get into it, and can be injured by nothing but great quantities coming upon it at once. This system of draining is sometimes attended with extraordinary consequences: by it not only the land below the natural spring, or even above the artificial spring, is drained, but the waters from the neighbouring heights, finding a new and readier channel, abandon the places to which they formerly went, and thus a tract of country may be drained without any apparent communication with the spring intended to be drained, or the trench made to it. Nay, a drain made on one side of a hill has been known to make springs and wells on the other side quite dry, by opening a channel to which the water more naturally draws. This practice may not only serve the purpose of draining land, but the complete command of a treasure of water being thus obtained, it is probable it may in many cases be used for flooding land, for mills and navigations, for supplying private houses, and even villages and towns, with wholesome water. A country thus loses that dampness which is so pernicious to the health of its inhabitants, and is also at the same time freed from its troublesome attendant, a foggy atmosphere. The produce of the soil is considerably increased in quantity, and improved in quality; while the rot, that destructive malady, to which so many millions of sheep fall a sacrifice, is prevented. In short, the advantages of draining are so many, that it is astonishing that the principles of the art have not been better understood, and that greater and more extensive exertions have not been made in so salutary and beneficial a practice.

Meadow Grass. See, *Poa, Cynosurus,* and *Grass.*

Meadow Rue. See *Thalictrum.*

Meadow Saffron. See *Colchicum.*

Meadow-Saxifrage. See *Peucedanum* and *Seseli.*

Meadow Sweet. See *Spiræa.*

Medeola; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* none, unless the corolla be called so. *Corolla:* petals six, ovate-oblong, equal, spreading, revolute. *Stamina:* filamenta six, awl-shaped, the length of the corolla; antheræ incumbent. *Pistil:* germina three, horned, ending in styles; stigmas recurved, thickish. *Pericarp:* berry roundish, three-cleft, three-celled. *Seeds:* solitary, heart-shaped. Essential Character. *Calix:* none. *Corolla:* six-parted, revolute. *Berry:* three-seeded.——The species are,

1. Medeola Virginiana; *Virginian Medeola.* Leaves in whorls; branches unarmed. It has a small scaly root, from which arises a single stalk about eight inches. Corolla four-petalled. It flowers in June.—Native of Virginia. This is hardy enough to live in the open air; but producing no seeds here, can be increased only by offsets.

2. Medeola Asparagoides; *Broad-leaved Shrubby Medeola.* Leaves alternate, ovate, subcordate, at the base oblique. This has a root composed of several oblong knobs, which unite at the top, like that of the Ranunculus, from which arise two or three stiff winding stalks, dividing into branches; the flowers come out from the side of the stalks, singly, or two on a short slender peduncle; petals dull white.—Native of the Cape. This and the next species propagate freely by the offsets from the roots; so that when they are once obtained, there will be no necessity of sowing their seeds, which commonly lie a year in the ground, and the plants will not be strong enough to flower in less than two years more; whereas the offsets will flower the following season. The time for transplanting and parting the roots is in July, when their stalks are entirely decayed, for they begin to shoot towards the end of August, and keep growing all the winter, and decay in the spring. They should be planted in pots filled with good kitchen-garden earth, and may remain in the open air till there is danger of frost, and must then be removed into shelter, as they are too tender to live through the winter in the open air. As the flowers make no great appearance, the plants are not preserved for their beauty, but on account of their climbing stalks and leaves, that are in full vigour in winter, as an addition to the variety of the green-house.

3. Medeola Angustifolia; *Narrow-leaved Shrubby Medeola.* Leaves alternate, ovate, lanceolate. This has a root like the preceding, but the stalks are not so strong, though they climb higher.—Native of the Cape.

Medicago; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, straight, campanulate-cylindrical, half five-cleft, acuminate, equal. *Corolla:* papilionaceous; banner ovate, entire, the margins bent in, the whole bent back; wings ovate-oblong, affixed by an appendage to the keel, with the sides converging under the keel; keel oblong, bifid, spreading, blunt, bent down from the pistil, and gaping from the banner. *Stamina:* filamenta diadelphous, united almost to the tops; antheræ small. *Pistil:* germen pedicelled, oblong, curved in, compressed, involved in the filamenta, starting from the keel, bending back the banner, ending in a short awl-shaped, almost straight style; stigma terminating, very small. *Pericarp:* legume compressed, long, bent in. *Seeds:* several, kidney-shaped or angular. Essential Character. *Legume:* compressed, bent in. *Keel:* bent down from the banner.——The species are,

1. Medicago Arborea; *Tree Medick,* or *Moon Trefoil.* Legumes crescent-shaped, quite entire about the edge; stem arboreous. This shrub, which is also called *Moon Trefoil,* from the shape of the pods and its trifoliate leaves, bids the fairest of any to be the *Cytisus* of Virgil, Columella, and the other ancient writers on husbandry; and being celebrated by them, has been recommended for cultivation here. But however useful it may be in Candia, Rhodes, Sicily, and other warm countries, it will not thrive in England so as to furnish food for animals, nor is it worth the trial, as we have so many other plants preferable to it. Yet though of no use to us as fodder, the beauty of its hoary leaves, which abide all the year, together with its long continuance in flower, render it deserving of a place in every good garden and plantation with shrubs of the same growth. It grows from four to eight feet high, dividing into many branches, with ternate leaves at each joint, several together, the whole shrub covered with them; flowers on peduncles from the sides of the branches, four or five together, of a bright yellow.—It may be propagated by sowing the seeds upon a moderate hot-bed, or a warm border of light earth, in the beginning of April, and when the plants come up, they should be carefully cleared from weeds; but must remain undisturbed, if sown in the common ground, till September following; if on a hot-bed, they should be transplanted about Midsummer into pots, placing them in the shade until they have taken root, after which they may be removed into a situation where they may be screened from strong winds, and abide till the end of October, when they must be put into a common garden frame, to shelter them from hard frosts. In April following, these plants may be

shaken out of these pots, and placed in the full ground where they are designed to remain, which should be in a light soil and a warm situation, in which they will endure the cold of our ordinary winters extremely well, and continue to produce flowers most part of the year. Those also which were sown in an open border may be transplanted in August following, in the same manner; but in doing this, be careful to take them up with a ball of earth to their roots, if possible, as also to water and shade them until they have taken root; after which they will require little more care than to keep them clean from weeds, and to prune off the luxuriant branches to keep them within due compass; but never prune them early in the spring, nor late in autumn, for if frost should happen soon after they are pruned, it will destroy the tender branches. They may also be propagated by cuttings, which should be planted in April upon a bed of light earth, and watered and shaded until they have taken root, after which they may be exposed to the open air; but they should remain in the same bed till July or August following, before they are transplanted, by which time they will have made strong roots, and may be removed with safety to the places where they are to remain. You may train them up with straight stems, by fastening them to sticks, otherwise they are apt to grow crooked and irregular; and when you have reared their stems to the intended height, they may be reduced to regular heads, and with pruning their irregular shoots every year, may be kept in very good order.

2. Medicago Virginica; *Virginian Medick.* Stem upright, very much branched; flowers in terminating bundles. The corolla is red and white variegated.—Native of Virginia.

3. Medicago Radiata; *Ray-podded Medick.* Legumes kidney-form, toothed at the edge; leaves ternate. Flowers small, yellow.—Native of Italy and the Levant. This, and the two following species, are annuals, and preserved in the gardens of those who are curious in botany. The seeds should be sown upon an open bed of fresh ground, in the places where the plants are to remain, because they do not bear transplanting well, unless where they are very young. As the plants spread their branches on the ground, they should not be sown nearer than two feet and a half asunder: when the plants come up, they will require no other care but to keep them clean from weeds. In June they will begin to flower, and as the stalks and branches extend, there will be a succession of flowers till autumn; but the early flowers will only have good seeds succeed them; for those which come late in summer, have not time to ripen before the cold weather comes on.

4. Medicago Circinata; *Kidney-podded Medick.* Legumes kidney-form, toothed at the edge; leaves pinnate. The whole plant is pubescent.—Native of Spain and Italy.

5. Medicago Obscura; *Doubtful Medick.* Peduncles racemed; legumes kidney-form, quite entire; stem diffused, rough-haired. Root annual; stems decumbent, long, four-cornered.—Probably a native of Germany.

6. Medicago Sativa; *Cultivated Medick*, or *Lucern.* Peduncles racemed; legumes contorted; stem upright, smooth. Root perennial; stalks annual, smooth, and striated, one to two or three feet high; leaves ternate; flowers in thick spikes; corolla purple, varying with pale blue, and with variegated flowers. This plant has been greatly celebrated for increasing the milk of cows; though Haller, who was certainly well acquainted with it, asserts that the cattle are liable to be blown by it, and soon grow tired of it.—It may possibly have been a native of Europe, continuing to be disregarded till it was imported into Greece from the East, after Darius had discovered it in Media, whence its name. It is said to be the principal green fodder for horses in Persia to this day. The Germans and other northern nations have adopted the modern name *Lucern* from the French, who also call it, *Trefle*, or *Foin de Bourgogne*, and *Grand Trefle;* the Italians name it *Medica, Lucerna*, and *Erba Spagna;* the Spaniards, *Alsalfa, Mielga*, and *Medica;* the Portuguese, *Luzerna*, and *Medicagem dos pastos;* and the Persians, *Gunscha.* It has not been cultivated in England in very considerable quantities, though it is evident that it will succeed here as well as in France or Switzerland, and that it resists the severest cold of our climate. —*Propagation and Culture.* A rich loamy earth is certainly an excellent soil for Lucern, but not being the most common, we must frequently be contented with such soils as are worse. Rocque says, that the strongest is to be preferred; and Mr. Belcher, that although it will succeed on middling sorts of land, it should, if possible, have a soil both stiff and dry, or, as he elsewhere says, such as is close, firm, and sound; in opposition to the foreign writers, with Tull and Miller, who recommend a light, loose, sandy soil. The right soils, according to others, are deep, rich, friable loams, whether sandy or gravelly, or flexible loams, dry, deep, and rich; in a word, all rich soils that are dry. In Kent, it is sown in dry lands. Under the South Downs of Sussex, in the vicinity of Eastbourn, where Lucern is a common article of cultivation, they rarely sow it upon any but the richest and deepest soils, thinking that it does not answer on any other. Their land is such a happy mixture of the calcareous and argillaceous, and is of so deep a staple, that any thing will grow upon it; and Lucern, Saintfoin, and Clover, may be found side by side. Good crops of Lucern have, however, been produced in gravelly, sandy, and stony loams, which were by no means rich, and even upon poor sandy gravel apt to burn. It has a better chance on thin loams, on rock, and on poor sands, (though no man would choose such soils for it if he had better,) because the roots of Lucern will travel far in search of nutriment. The great business of the culture is to keep it free from weeds, especially whilst it is young; much depends upon preparing the soil in such a manner that all sorts of useless plants shall be killed. It is much cheaper to prevent weeds than to destroy them; and every shilling laid out in cleaning the land, will save a crown in hoeing the crop. For this reason two successive crops of Turnips or Carrots prepare the land well for it: but as Turnips upon good loams, if carted in a wet season, are apt to prevent that friability which is necessary for Lucern, the Turnips should be fed off in autumn, and the land immediately ploughed. Carrots are not liable to any objection, for they should always be drawn and laid up before winter; and the incessant hoeing which they require, cleans the land admirably. If the land be prepared by a fallow, let a man with a basket and four-pronged fork follow the plough in every furrow, and the harrows whenever they work, to pick up all roots and weeds, and to clear away such knots and tufts as the plough does not go deep enough to eradicate. Carrots, Turnips, or Cabbages, may be made the preparatory crops; at least there should be two hoeing crops in succession. In the second spring, previous to the sowing, there should be three ploughings, and harrowings enough to pulverize the soil well. In Kent, the common tillage is a good summer fallow, ploughed as deep as possible, with a good covering of manure. Circumstances must decide whether broad-cast or drilling should be preferred in sowing the seed. If the farmer be doubtful whether he shall be able to give a regular and constant attention to hand and horse hoeing, or if he be satisfied with his crop lasting eight or ten years, then the broad-cast may be preferred. But if he be willing and able

to have the crop perfectly well managed in respect to hoeing, and if he be desirous to have it last twenty or thirty years, he will then probably prefer the drill culture. Both have their advantages and disadvantages; but whichever method be adopted, the time of sowing is chiefly during the month of April. The end of March is commonly too early: and the chance of a failure is greater in May than in April, both on account of the drought and the fly. It should be sown later on heavy than on light lands; and if possible in dry weather, when there is a prospect of showers. Twenty pounds of seed to an English acre is generally allowed to be the proper quantity. As to the distance between the rows, some respect should be had to the quality of the land. The rows may be closer on land that is less rich. Thus some recommend one-foot rows on soils worth thirty shillings an acre, and nine-inch rows on those worth only twenty shillings: reputing soils of less value as in general not to be much recommended for Lucern. Two-feet rows will admit of horse-hoeing; and the plants cannot be kept clean without it, except at too great an expense. Mr. Miller was a decided enemy to sowing this or any other leguminous crop with corn, though many others are advocates for the mixture. If the Lucern be sown with corn, and that be suffered to stand for a crop, as soon as the harvest is over, nothing is to be done except keeping out cattle; or at least the stubble should be fed only by calves and young cattle, and that in dry weather. The weeds should be collected and carried off, and then it may be levelled for the scythe with a barley roller. Half a growth in autumn, instead of being mown, may be fed off with cattle. Before every harrowing, if there be any thin places, some seed may be scattered into them. I do not see why, says Mr. Young, in sowing Lucern broad-cast, the plants may not be singled out and kept clean with the hand-hoe, in the same manner as Turnips. After the frosts are over, and vegetation begins, the land may be harrowed, if foul; but if clean, that operation will not be required till after the first cutting. In the drilled culture, when the rows are come up, and weeds being to appear, in dry weather a shim should be run between them, to cut up the weeds and loosen the soil; and a hand-hoeing and picking should follow, to clear them perfectly. These operations must be repeated as they are wanted. The year following, so soon as the land is dry enough in the spring, and through the whole summer, it must be a constant conflict between the shim or hoe and any weeds that may appear. The crop must be kept constantly and absolutely clean; but the principal attention is to be given immediately after every cutting, the weeds being then best discovered, and most easily destroyed, particularly by the horse-hoe, where the rows are wide enough to admit of that instrument. If the rows be very straight, the shim is of great use, because it may be directed so near the rows as to save much hand-hoeing, and for getting out such weeds as grow among the plants, a pronged hoe is of much service. Every one knows the precariousness of annual grasses; but in Lucern the farmer has a provision for his cattle, nutritious, plentiful, early, and sure. Still to enhance it, part of the plantation may be sown with Tares, and part with white Oats: in order to cut for the first crop, the part under which are the Tares, before they are advanced; for the second, that with the Oats; and thirdly, that with the Tares the second time. This last will be a prodigious crop, and by matting together, powerfully subdue the weeds. It must be a very indifferent acre that will not keep a horse the summer, and a very good one will maintain two.—The seed for transplanting should be sown early in the spring, in order that the plants may be sizeable in the following August. It is best sown in drills, and the young plants may be much assisted in their growth with a small hand-hoe, such as gardeners use among onions. The management of transplanted Lucern while growing, must be the same as the drilled crops; only the first season, it being set in August, will require one or two hoeings in the autumn. Transplanted Lucern has two advantages over that which is drilled, and still more over broad-cast: first, that each root will stand at a proper distance from its neighbour, and receive its due proportion of nourishment; or if a few sets chance to fail, they way be supplied from the nursery, any moist day, from April to the middle of September: secondly, by cutting the tap-root, it is prevented from penetrating ten or twelve feet perpendicular into the ground, which it naturally does in three or four years, except it be obstructed by a stratum of rock, or chilled at root by weeping springs, or find admission into a bed of cold clay; in all which cases the crop makes a poor appearance, or goes off all at once. The early springing of Lucern is one of its most valuable properties. It may be depended on for much earlier food for sheep and lambs than any grass, and in rich warm land will yield a feeding of some account by the middle of March, and continue very productive all April, in which season the sheep-master is more distressed than at any other time of the year Sheep must not, however, be kept on it in such numbers, and so long, as to make them eat into the crown of the plants, which damages them much; they will not, however, do this while there any young shoots remaining. The proper time of cutting grasses, and this, with other leguminous plants, vulgarly called artificial grasses, is when they are in full blossom; but this rule can only be followed for hay. The best use of Lucern is for soiling, and consequently such portions of it should be set out for every day as will ensure a constant supply. Broad-cast crops will not grow so fast as those which are drilled or transplanted, nor usually yield more than three full growths in the six growing months. Drilled and transplanted crops, on good land, may be distributed into forty divisions; but on very fine land, into thirty By this means, which of course is to be varied as the cultivator finds the growth of his crop, he will always have a succession ready for the scythe. The growth on well-cultivated rich land is very great, rising to eighteen inches in thirty or forty days, and yielding five good cuttings between April and September. The reaping hook or sickle has been recommended for cutting it, in preference to the scythe: this may do where small parcels are cultivated, and where the rows are forty inches asunder; but in broad-cast and closer drilled Lucern, the scythe will do the work very well, and for less than a fourth of the expense. The Lucern should be gathered into a one-horse skeleton cart, and carried directly to the stable door, if it be for soiling horses.—Broad-cast Lucern, with good management, may last seven or eight years. It does not attain its full vigour before the third, or, according to others, not until the fifth year. This therefore is an objection to sowing broad-cast, which declines, and even wears out, fast after the seventh or eighth year. Upon soils that are not remarkably fertile, manure should be occasionally given to this crop. Rotten dung is the best spread upon it early in winter; about twenty tons to an acre, once in five or six years, will be an ample allowance. If dung cannot be spared, soot or ashes may be substituted.—*Produce.* The produce of a Lucern crop, like that of all others, will depend on soil and management. They reckon in some parts of France, that an acre of it produces more than six acres of good grass; in others, as much as three only; and of hay, more than four tons. Some of their crops have risen to nine tons. Mr. Wynne Baker mentions eight tons of hay to

the Irish acre, which is five to the English measure. Others state good crops at from twenty to forty tons, and twenty-five at an average. Duhamel mentions forty tons; and near Barcelona the produce of green fodder amounts to fifty tons on an acre in one season. Rocque, at Walham Green, got eight loads an acre at five cuttings; and to the value of thirty-five pounds for soiling. Mr. Harte, the first year after transplanting, had about eight tons from an acre. Mr. Baldwin had above fourteen tons from four cuttings. Some persons are of opinion that constant mowing exhausts the crop; that, however, does not appear to be the case, but, on the contrary, agrees better with it than leaving it for a full crop of hay: yet even thus the advantage is considerable; for at three mowings, a good acre will produce four tons of dry hay, and sometimes even five; which, though it does not greatly exceed two cuttings of Clover, yet considering that the latter is exhausted in one year, and that Lucern lasts as long as you please, is a very great superiority. "Horses, (says Monsieur Duhamel,) fed with Lucern, except when employed in journeys, or other hard work, require neither oats nor beans." No food makes their coats so smooth and well-coloured. But when a horse begins this succulent food, he should have a small quantity, as ten pounds, which should be gradually increased for three weeks to twenty, thirty, and perhaps forty pounds. It should also be given in small quantities, and slightly moistened with water, to such horses as are touched in their wind. It is too full of nourishment for hunters, and should be given in less quantities to saddle horses, than to coach and cart-horses. When they are first fed with it in the spring, it may not be amiss to take a little blood from them; and if those who feed them can be persuaded to give them a little, and often, they will eat with more appetite, and make no waste. Lucern is excellent for soiling cows and young cattle in a farm-yard, and for working oxen. A middle-sized cow will eat from ninety to a hundred and ten pounds in twenty-four hours; but the same caution is necessary to prevent their hoving or being blown, as with Clover. This plant appears to be admirable for fattening beasts. Mr. Young remarks, from an experiment of his own, that the effect of it in fattening is a proof of its great value; that its superiority over Tares is prodigious; and that, when once established, it is far cheaper. With respect to sheep, there is some doubt whether they are not apt to damage the crown of the root, and thereby to prevent, or at least weaken, the shoots that should furnish the succeeding cuttings. This should be a caution not to let sheep lie on Lucern too long. The first growth in the spring is of great use for ewes and lambs. Mr. Baldwin fattened Welsh weathers on it with great success. It is best given them in racks. It may be fed after the last cutting, in dry weather, with any kind of stock; in wet weather, with sheep, to whom no plant is more agreeable or nourishing. There is no doubt that Lucern is excellent food for swine, who do it no damage, as they do not bite closely like sheep; but it is better to soil them with it in the yard or sty, on account of the great value of their dung. Lucern makes excellent hay, and should not be stirred about much, that the leaf may be preserved. Rocque directs that it should be mown for hay as soon as the bloom appears, or sooner; that it should lie in the swath, and be turned as Clover.—With respect to saving the seed of the plant, Mr. Miller, from his own experience, commends English seed in preference to foreign; others say that the seed is not worth saving in England. Rocque directs it to be saved, not from the first, but from the second growth. The difference of Lucern from English seed and French, sown on the same day upon the same soil, was prodigiously in favour of the latter. The home seed was larger, did not come up so soon by two days, and then not near so thick; however, the produce being weighed, was nearly equal in both: whence it appears that the difference was entirely at starting, and they were equal afterwards. One main obstruction to the more general cultivation of Lucern, seems an idea of the great expense attending it. Mr. Young observes, that plants sown on well-cleaned land, and kept clean by hoeing afterward, is procured at an expense which is seldom calculated fairly. Besides the annual expense of probably three pounds per acre, a crop of corn on good land cannot be estimated at less than five pounds; and to balance this, the produce the first year is very inconsiderable. The second year must be very good, to pay its own charges, and the drawback of the preceding year. Now a cultivation, which at the end of two years shall have paid nothing in profit, is not worth attention. If it can be got with corn, the case is different; and foreign Lucern is all sown with corn. When Lucern, however, is sown broad-cast, a small crop of Barley or Oats may be obtained, sufficient at least to pay all expenses, without much injuring the Lucern, in favourable seasons. Between the rows of drilled or transplanted Lucern, any of the crops usually drilled may be put in, as Beans, Cabbages, &c. or Vetches may be sown at intervals; or, Broad Clover may be mixed with broad-cast Lucern, or sown in the spaces of that which is drilled or transplanted. This practice may in some degree meet the above objection to the culture of this valuable plant, and render it worth the attention of the farmer for profit as well as convenience. And even admitting it not to be so profitable as its too sanguine friends believe; still it may be convenient to have a quantity for ewes and lambs early in the spring, for soiling horses occasionally, and supplying the deficiencies of other foddering crops.

7. Medicago Falcata; *Yellow Medick.* Peduncles racemed; legumes crescent-shaped; stem prostrate. Root perennial; stems round, smooth, slightly striated, procumbent, but ascending or bending upwards towards the end, branching two, three, and sometimes four feet in length; flowers in short loosish racemes, each on a pedicel. Corolla yellow, varying much in the colour, which is sometimes white, quite white, or greenish, as well as of different shades of yellow. The roots strike very deep, and are difficult to eradicate. It is common in the south of Europe, by way-sides and in dry pastures. With us it is also common in the sandy grounds near Bury in Suffolk. It has been observed near Norwich and Yarmouth, between Watford and Bushy; and at Quey, Bournbridge, Wilbraham, and Linton, in Cambridgeshire. The *Variegated Medick*, which appears to be a variety of this species, is less erect and less succulent than Lucern; but more succulent, and much more luxuriant, than the Yellow Medick. The flowers are beautifully varied in every shade of blue and greenish yellow, and some are almost white; and Mr. Young thinks it may bid fair to rival Lucern itself.—The Yellow Medick is hardier than Lucern, roots stronger, grows in drier soils, yields abundance of fodder very nearly allied to Lucern in quality, and loses less in drying. See the preceding species.

8. Medicago Lupulina; *Hop* or *Black Medick.* Spikes oval; legumes kidney-form, one-seeded; stems procumbent. Root annual, or biennial, with few fibres, and penetrating deeply into the earth; stems about a foot long, numerous, trailing unless supported; flowers small, yellow, from thirty to forty and upwards in a head, which is at first roundish, afterwards oval. The ripeness of the seeds is known by the blackness of the seed-vessels, from which it has obtained the names of *Black-seed* and *Black Nonesuch*, among some culti-

vators.—It grows naturally on dry banks and hilly pastures, chiefly in a sandy or dry soil, and is common in New England, flowering in June and July. This plant has been much sown of late years for sheep-feed in open fields, where it is a considerable improvement, first for the sweet food, and then to help the land by ploughing it in, getting a good crop of wheat after it on different soils. The seed falls so readily, that great loss ensues from moving it; and in threshing, the least stroke clears it. The best way therefore is to thresh it in the field on a cloth, which is moved to the seed, and not the seed to the cloth.

9. Medicago Marina; *Sea Medick.* Peduncles racemed; legumes spiral, spiny; stem procumbent, tomentose. Miller describes it as a perennial plant, with trailing woolly branches about a foot long, divided into many small branches; leaves small, downy, on short footstalks at each joint; flowers from the side and at the ends of the branches, in small clusters, of a bright yellow colour. They appear in June and July, and the seeds ripen in September.—Native of the shores of the Mediterranean. This plant is propagated by seeds, sown upon a warm border of dry soil in the spring, where the plants are designed to remain. When the plants are come up, two or three of them may be transplanted into small pots, to be sheltered in winter, because in very severe frosts those which are in the open air are frequently destroyed; though it will endure the cold of our ordinary winters, in a dry soil and sheltered situation. The remaining plants require only to be thinned and kept clean. It may also be increased by cuttings, planted in June or July, in a shady border, covering them close with a glass, to exclude the external air: they will take root in about six weeks, and may then be either planted in a warm border or in pots, and treated in the same way as the seedlings.

10. Medicago Polymorpha; *Variable Medick.* Legumes spiral; stipules toothed; stem diffused. Root annual, oblong, branched. Linneus justly names this species *Polymorpha*; and remarks, that, like the dog among the animals, this plant produces numerous varieties, though not in the same country. Some of these varieties are erected into species by Gerard, Miller, Gærtner, and others, but they are not worth enumeration here. Some of them are common in flower-gardens among other annuals, under the names of *Snails* and *Hedgehogs*, from the singular form of their seed-vessels.—Native of the south of Europe, Great Britain, &c. They are propagated by seeds sown in the middle of April, where they are to remain; they require no culture but to be thinned and kept clean. The variety called Heart Trefoil, or Heart Clover, but more properly Heart Medick, or Spotted Medick, is frequently very luxuriant among Lucern, Saintfoin, and Trefoil, and might be cultivated for the same purpose as the latter; but on account of its hairiness, and the roughness of the seeds, it should be cut or pastured when young.

11. Medicago Prostrata; *Prostrate Medick.* Legumes spiral, unarmed; leaves ternate, wedge-shaped, toothed at the top; stipules bristle-shaped, quite entire; stem diffused. This very small plant has a small fruit, and is nearly allied to the preceding, although perennial.—Native of exposed stony ground in Hungary and Italy.

Medical Terms.—In order to explain the difficult medical terms used in the various prescriptions with which this work abounds, we have introduced the following elucidations. Relaxing medicines, when externally applied, and supposed to soften the parts, are called emollients; while others, which are supposed to possess the power of augmenting the secretion of pus in inflamed parts, are termed suppuratives. Sedative medicines; that have the power of assuaging pain, are denominated paregorics; if they altogether remove or destroy pain, they are called anodynes; if they take off spasm, antispasmodics; if they procure quiet sleep, hypnotics; if a very deep and unnatural sleep, together with considerable stupefaction of the senses, narcotics. Tonic medicines obtain the name of corroboratives, analeptics, or nervines, when they slightly increase the contractile power of the solids; but of astringents or adstringents, if they do this in a great degree. Some of this order of medicines have been supposed to promote the growth of flesh, to consolidate wounds, and restrain hæmorrhages, and hence the name of sarcotics and traumatics, or vulneraries. Other astringents again are called repellent, discutient, stimulant, or alterative, according to the respective modes by which they are conceived to promote one common effect. Medicines of the inflammatory tribe, are in like manner divided into vesicatories or blisters, if by their application they raise watery bladders on the skin; cathæretics, escharotics, or corrosives, if they eat into and destroy the substance of the solid parts themselves; and rubefactive or rubefacient, if, possessed of less power than the vesicatories, they merely produce redness on the part to which they are applied. The alterant tribe is divided into absorbents, antiseptics, coagulants, resolvents, calefiants, and refrigerants, according to the peculiar mode by which they are supposed to operate. The evacuants are called emetics, when they evacuate the contents of the stomach by vomiting; cathartics, if they induce purging; laxatives, if they produce a moderate discharge of feces. Again, they are named diaphoretics, if they promote the expulsion of humours through the pores of the skin, with only a small increase of action; sudorifics, if the increase of action be greater, and the discharge more copious. Such as excite urine are called diuretics; such as produce evacuation from the glands of the palate, mouth, and salivary ducts, salivating medicines; those that promote the discharge of mucus from the throat, apophlegmatics; those that evacuate by the nose, ptarmics, errhines, sternutatories; and those which promote the menstrual discharge, emmenagogues. Those medicines which expel worms are sometimes called anthelmintics; those that are supposed to remove or dissolve stones in the bladder, lithontriptics; and those that remove wind, carminatives.

Medick. See *Medicago.*

Medlar. See *Mespilus.*

Medusa's Head. See *Euphorbia.*

Meesia; a genus of the class Cryptogamia, order Musci.—Generic Character. *Capsule:* oblong; peristome double; outer with sixteen short blunt teeth; inner with as many sharp cilias, distinct, or connected by net-work. *Males:* approaching the females, or discoid on a different plant.—Three species are all that have been referred to in this genus by Hedwig, and these have been reduced to *Bryum.*

Melaleuca; a genus of the class Polyadelphia, order Icosandria.—Generic Character. *Calix:* perianth turbinated, five-cleft, half superior. *Corolla:* petals five, rounded, inserted into the inner margin of the calix. *Stamina:* filamenta many, very long, united in five bundles; antheræ incumbent. *Pistil:* germen turbinate, fastened to the bottom of the calix; style one, filiform, upright; stigma simple. *Pericarp:* capsule subglobular, half inferior, or half covered with the calix, three-celled. *Seeds:* oblong, when unripe linear-chaffy; when ripe, usually winged. Essential Character. *Calix:* five-cleft, half superior. *Petals:* five. *Filamenta:* many, very long, in five bodies. *Style:* one. *Capsule:* three-celled.——This a fine genus of aromatic trees and shrubs, with lateral inflorescence, and simple entire leaves; all growing in New Holland, except the first. Eighteen species

have already been described, among which are the following:

1. Melaleuca Leucadendron; *Aromatic Melaleuca.* Leaves alternate, lanceolate, acuminate, obliquely sickled, five-nerved; branchlets and petioles smooth. This tree has a black trunk and white branches, whence the name Melaleuca. The cajeput oil is not produced from this, but the next species.—Native of some parts of the East Indies, and Cochin-china.

2. Melaleuca Minor; *Smaller Cajeput-tree.* Leaves scattered, elliptic-lanceolate, bluntish, straight, five-ribbed; young branches and germens downy.—Native of Amboyna. This is the species which yields the *cajeput oil.* It is imported from the East Indies, and is distilled chiefly in the island of Banda: from its exorbitant price, it is frequently adulterated; and is therefore seldom found perfectly pure in Europe. This oil appears to be a powerful medicine, and is much esteemed in Germany, as well as in India, as a general remedy in chronic and painful complaints. Taken into the stomach, in the dose of five or six drops, it heats and stimulates the whole system, proving at the same time a very certain diaphoretic. It has been used both internally and externally with much advantage in several obstinate disorders, as palsy, hypochondriacal and hysteric affections, deafness, defective vision, tooth-ach, gout, rheumatism, menstrual obstructions, herpetic eruptions, &c. The dose is from two to six, and even twelve, drops.

3. Melaleuca Viridiflora; *Green-flowered Melaleuca.* Leaves alternate, elliptic-lanceolate, coriaceous, five-nerved; branchlets and petioles pubescent. The flowers are of a pale yellowish green.—Native of New South Wales.

4. Melaleuca Laurina; *Spurge-laurel-leaved Melaleuca.* Leaves alternate, obovate, lanceolate, one-nerved; peduncles axillary, dichotomous, pubescent. This species is not aromatic.—Native of New South Wales.

5. Melaleuca Stypheloides; *Styphelia-like Melaleuca.* Leaves alternate, ovate, mucronate-pungent, many-nerved; flowers lateral; calicine teeth striated, mucronate.—Gathered near Port Jackson.

6. Melaleuca Ericifolia; *Heath-leaved Melaleuca.* Leaves scattered or opposite, linear, nerveless, subrecurved, awnless; flowers lateral, clustered towards the top of the branchlets.—Native of New South Wales.

7. Melaleuca Armillaris; *Diosma-like Melaleuca.* Leaves scattered, linear, mucronate, recurved at top; flowers lateral; filamenta very long, linear, radiate-multifid at top.—Native of New South Wales.

8. Melaleuca Genistifolia; *Broom-leaved Melaleuca.* Leaves scattered, lanceolate, mucronate, three-nerved, many-dotted; flowering branchlets terminating, loose; filamenta radiate-multifid at top.—Native of Port Jackson.

9. Melaleuca Linariifolia; *Toad-flax-leaved Melaleuca.* Leaves opposite, linear-lanceolate, three-nerved, many-dotted beneath; flowering branchlets terminating, loose; filamenta pinnate. This is a large tree, the bark of which is very thick and spongy, serving the purpose of tinder. The leaves have a flavour like nutmeg.—Native of New South Wales.

10. Melaleuca Thymifolia; *Thyme-leaved Melaleuca.* Leaves opposite, elliptic-lanceolate, nerveless; flowering branchlets lateral, very short, few-flowered; filamenta branched to the middle: flowers purple, ranged along the branches of a year or two old, in little, short, opposite spikes, which soon, however, prove to be branches by the leaves shooting out at their ends. The teeth of the calix are permanent, and the whole of that part, as well as the back of the leaves, abounds with a fragrant essential oil, lodged in pellucid prominent dots.—Native of New South Wales.

11. Melaleuca Hypericifolia; *St. John's Wort-leaved Melaleuca.* Leaves opposite, elliptic-oblong, one-nerved; flowers clustered; filamenta very long, linear-radiate, multifid at top. The flowers grow in a cylindrical form round the branches. It is the most beautiful plant of its genus, abounds in the English gardens, and was generally taken for an Hypericum, till it produced its elegant flowers.—Native of New South Wales.

Melampodium; a genus of the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common five-leaved, flat; leaflets subovate, the length of the flower, spreading very much. *Corolla:* compound, radiated; corollets hermaphrodite, in the disk: female about five in the ray; proper of the hermaphrodite one-petalled, funnel-form, five-toothed, erect; of the female ligulate, ovate, entire, or three-toothed. *Stamina:* in the hermaphrodites; filamenta five, very small; antheræ cylindric, tubular. *Pistil:* in the hermaphrodites; germen very small; style bristle-shaped, the length of the corolla; stigma obsolete. In the females; germen subovate, compressed, with rugged sides, the top flat and membranaceous; style very short. *Pericarp:* calix unchanged. *Seeds:* in the hermaphrodites none; in the females solitary, obovate, compressed, four-cornered, prickly at the sides, crowned with a heart-shaped, involuted, converging calicle. *Receptacle:* chaffy, conical; chaffs lanceolate, coloured, the length of the florets. Essential Character. *Calix:* five-leaved. *Receptacle:* chaffy, conical; down one-leafed, involuted, converging.——The species are,

1. Melampodium Americanum. Stem upright, herbaceous, villose; leaves linear, lanceolate, pinnatifid, hairy on both sides; corolla yellow.—Native of La Vera Cruz.

2. Melampodium Australe. Stem decumbent; leaves oval, serrate.—Native of South America.

3. Melampodium Humile. Stem upright; leaves lyrate-toothed, sessile.—Native of Jamaica and San Domingo. This, with the two preceding species, are propagated by sowing the seeds on a hot-bed in the spring.

Melampyrum; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, four-cleft; divisions slender, permanent. *Corolla:* one-petalled, ringent; tube oblong, recurved; border compressed; upper lip galeated, compressed, emarginate, the lateral little margins reflex; lower lip flat, upright, the length of the other, half three-cleft, equally blunt, marked with two risings in the middle. *Stamina:* filamenta four, awl-shaped, curled, concealed beneath the upper lip, two shorter; antheræ oblong. *Pistil:* germen acuminate; style simple, situation and length of the stamina; stigma blunt. *Pericarp:* capsule oblong, oblique, acuminate, compressed; upper margin convex; lower straight, two-celled, two-valved, opening by the upper suture; partition contrary. *Seeds:* solitary, or one in each cell, (according to Linneus, two,) ovate, gibbous, elongated at the base. Essential Character. *Calix:* four-cleft. *Corolla:* upper lip compressed, with the edge folded back. *Capsule:* two-celled, oblique, opening on one side. *Seeds:* two, gibbous.—These plants are seldom cultivated in gardens, some of them indeed are common weeds, but not noxious in England. The seeds of all the sorts should be sown in autumn soon after they are ripe, otherwise they seldom grow the first year. When the plants come up, weed them in the spring whilst young. As soon as they begin to shew their flowers, cattle may be turned in upon a space hurdled off; for if they are permitted to run over the whole field, they would trample down the crop, and destroy a great part of it.——The species are,

1. Melampyrum Cristatum; *Crested Cow-wheat.* Spikes quadrangular; bractes heart-shaped, compact, toothletted,

imbricate. The whole plant is nearly smooth, extremely branched; branches opposite; leaves opposite, sessile, linear, but tapering to a point; flowers in closely imbricated spikes, forming heads, terminating the stem and branches; they are reddish, others say yellow and white. In the autumn they grow eighteen inhces or two feet high; and where there are numbers together, the numerous diverging branches are so entangled that it is very difficult to extricate them.—It flowers in June and July, and is common in the woods of Bedfordshire; and in Madingly and Kingston Woods, Cambridgeshire. Found also among corn in Walton-field, near Wakefield, Yorkshire; and in Braybrook Wood, and at Newton and Yarwell, in Northamptonshire. Ray observed it in mountainous woods near Geneva; and it is found on many other parts of the Continent.

2. Melampyrum Arvense; *Purple Cow-wheat.* Spikes conical, loose; bractes tooth-bristled, coloured; stem upright, slightly hairy, branched; corolla yellow, and dusky purple. The seeds, when ground with corn, give a bitterish and a grayish cast to the bread, but do not render it unwholesome. —It is a corn-weed in many parts of Europe; among wheat in the more southern parts, and among rye in the northern. Found also in Denmark and Japan. It is a delicious food for cattle, and might be cultivated for fattening oxen.

3. Melampyrum Nemorosum; *Wood Cow-wheat.* Flowers directed the same way, lateral; bractes toothed, the uppermost coloured, barren; calices woolly. Root small, annual; stem a foot and half high, upright, brachiate, four-cornered; bractes blue violet, laciniated at the base, or toothed, woolly underneath; corolla herbaceous, yellow, with the origin of the throat and gape deeper yellow; the tube purple, and curved inwards; lower lip trifid, more lengthened out than in the other species, orange-coloured.—Native of woods in the north of Europe. Linneus, who appears to have been struck with the beauty of the plant and the splendour of the flowers, remarks that it is not a native of England, nor of several provinces of Sweden. It makes a pretty appearance with its purple tops, in the months of July and August, and deserves a place in the flower-garden among other annuals.

4. Melampyrum Pratense; *Meadow Cow-wheat.* Flowers directed the same way, lateral; leaves in distant pairs; corollas closed. Stem feeble, cylindrical towards the bottom, four-cornered upwards; flowers yellow, solitary, leaning one way. Linneus observes, that where this plant abounds, the butter is yellow and uncommonly good; that cows are very fond of it, though they refuse the *Arvense.* Sheep and goats eat it; horses and swine refuse it, though the latter are very fond of the seeds.—It is frequent in the woods of Norfolk and Suffolk, and other parts of the kingdom, in a clayey soil, and was long confounded with the following species.

5. Melampyrum Sylvaticum; *Yellow Cow-wheat.* Flowers directed the same way, lateral; leaves in distant pairs; corollas gaping wide, yellow.—Native of many parts of Europe in woods. It is much rarer in England than the preceding species, if it be really distinct from it, and if the true *Sylvaticum* of foreign authors be found with us. Observed at Wick Clifts, Whitewood, and Hartley-wood, in Cambridgeshire; also in the way from Tay-mouth to Lord Breadalbane's cascade, and about Finlarig at the head of Loch-Tay.

6. Melampyrum Lineare. Lower leaves linear, entire; flowers axillary, distinct, yellow; stem about six inches high, round, erect.—It grows in shady woods, particularly on the mountains from Canada to Carolina.

Melanthium; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* none, unless the corolla be so called. *Corolla:* petals six, ovate-oblong, spreading, with linear longer claws, permanent. *Stamina:* filamenta six, filiform, erect, the length of the corolla, into which they are inserted above the claws; antheræ globular. *Pistil:* germen conical, striated; styles three, distinct, curved; stigmas blunt. *Pericarp:* capsule ovate, three-cornered, three-grooved, three-celled, composed of three capsules united within. *Seeds:* very many, compressed, half ovate. Essential Character. *Corolla:* six-petalled. *Filamenta:* from the elongated claws of the corolla.——The species are,

1. Melanthium Virginicum; *Virginian Melanthium.* Flowers panicled; petals with claws, hirsute on the outside; corolla of a dusky colour.—Native of Virginia, and other parts of North America.

2. Melanthium Lætum; *Spear-leaved Melanthium.* Raceme oblong; petals sessile; leaves smooth, lanceolate-linear; stem-leaves remote. It flowers in June.—Native of North America.

3. Melanthium Sibiricum; *Siberian Melanthium.* Panicle very long; petals sessile; leaves linear, acuminate. Root bulbous, oblong; stem naked, a foot high, round, surrounded by a single linear short leaf.—Native of Siberia.

4. Melanthium Capense; *Spotted-flowered Melanthium.* Petals dotted; leaves lanceolate, cowled; stems quite simple. —Native of the Cape.

5. Melanthium Indicum; *Indian Melanthium.* Petals linear-lanceolate; leaves linear. Root bulbous; stem simple, upright, smooth and even; flowers shorter than the leaves, dark purple.—Native of Tranquebar in the East Indies.

6. Melanthium Cochin-chinense; *Cochin-chinese Melanthium.* Petals sessile; leaves three-sided; flowers solitary, axillary. Root consisting of a bundle of oblong, fleshy, reddish brown tubers; stem six feet high, shrubby, round, slender, branched, procumbent, with short scattered prickles.— Common in the dry hedges of China and Cochin-china.

7. Melanthium Viride; *Green-flowered Melanthium.* Leaves ovate, lanceolate; corolla reflex; petals white, lanceolate.—Native of the Cape.

8. Melanthium Ciliatum; *Fringe-leaved Melanthium.* Leaves ensiform, cowled; flowers in spikes; petals with claws, white.—Native of the Cape.

9. Melanthium Triquetrum; *Rush-leaved Melanthium.* Leaves three-cornered, smooth; flowers in spikes.—Native of the Cape.

10. Melanthium Monopetalum; *One-petalled Melanthium.* Corolla one-petalled; leaves cowled, lanceolate. Root globular, smooth; stem none, or a finger's length, round, simple, sheathed, striated.—Native of the Cape.

11. Melanthium Monoicum. Panicles with male flowers below; female panicles above, branchy; petals oblong, plain, short-unguiculate, bimaculate; style one, half the length of the germen. It flowers in July.—Found on the mountains of Virginia and Carolina.

12. Melanthium Hybridum. Petals subrotund, unguiculate, plicate-undulate, scarcely maculate, rough on the outer side; flowers small, pale white, appearing in June and July. —It grows on the sides of hills in Virginia and Carolina, in a moist fertile soil.

Melastoma; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, ventricose at the base, four or five cleft, permanent. *Corolla:* petals four or five, roundish, inserted into the throat of the calix. *Stamina:* filamenta eight or ten, inserted into the calix, short; antheræ long, somewhat curved, upright, one-celled, gaping at top with an oblique hole; scalelets two, very small, diverging, annexed to each filamentum below the antheræ, the rudiment of another

cell. *Pistil:* germen roundish, in the belly of the calix; style filiform, straight; stigma blunt or headed. *Pericarp:* berry two, three, four, or five celled, wrapped up in the calix, roundish, crowned with a cylindric rim. *Seeds:* very many, nestling. ESSENTIAL CHARACTER. *Calix:* five-cleft, bell-shaped. *Petals:* five, inserted into the calix. *Berry:* five-celled, wrapped up in the calix: (according to Gærtner, *Capsule* with a soft pulp, five-celled, opening in five parts at top.)—The best way to obtain the numerous plants of this genus, is to have the entire fruits put up in dry sand as soon as they are ripe, and forwarded to England by the quickest conveyance. They should be taken out as soon as they arrive, and the seeds sown in pots of light earth, and plunged into a moderate hot-bed of tanner's bark. When the plants are fit to remove, plant each in a small pot of light earth, plunging them into the tan-bed; afterwards treat them as other woody stove-plants. They may also be propagated by cuttings and layers.——The species are,

1. Melastoma Acinodendron. Leaves toothletted, with three nerves or thereabouts, ovate-acute. This becomes a large tree, having many crooked branches, with a brown bark. The fruit grows in loose spikes at the end of the branches, is thinly placed in the spikes, and of a violet-colour. —Native of South America.

2. Melastoma Grossulariodes. Leaves toothletted, triple-nerved, ovate, acuminate.—Native of Surinam.

3. Melastoma Scabrosa. Leaves triple-nerved, toothletted, ovate, rugged, hirsute; flowers axillary, aggregate, sessile, eight-stamined.—Native of the cooler mountains of Jamaica.

4. Melastoma Hirta. Leaves toothletted, five-nerved, ovate-lanceolate; stem hispid.—Native of the woody mountains of Jamaica, flowering in spring and autumn.

5. Melastoma Fragilis. Leaves serrate, five-nerved, netted; racemes with sessile flowers, all directed one way. This is a stiffish shrub.—Native of Surinam.

6. Melastoma Aspera. Leaves quite entire, three-nerved, lanceolate, rugged.—Native of the East Indies.

7. Melastoma Holosericea. Leaves entire, three-nerved, sessile, ovate-acute, villose-silky; racemes brachiate; branches two-parted; stem acutely quadrangular; corollas large; petals violet-purple.—Native of Jamaica and Brazil.

8. Melastoma Strigosa. Leaves quite entire, three-nerved, strigose, ovate; flowers solitary. A shrub, with purple corollas.—Found by Mutis in New Granada.

9. Melastoma Sessilifolia. Leaves quite entire, triple-nerved, spatulate, sessile, tomentose underneath.—Native of Jamaica.

10. Melastoma Malabathrica. Leaves quite entire, five-nerved, lanceolate-ovate, rugged. This is a tree, with rugged branches.—Native of the East Indies.

11. Melastoma Lævigata. Leaves quite entire, five-nerved, ovate-oblong, levigated, acuminated, even about the edge. This is an upright shrub, about the height of a man; stem smooth and even.—Native of Jamaica.

12. Melastoma Discolor. Leaves quite entire, five-nerved, oblong, acuminate, smooth and even at the edge; racemes cymed; flowers eight-stamined. This tree is about fifteen feet high, with subreclining ash-coloured branches, the younger ones tomentose; flowers small, scentless, yellow.—Native of the West Indies, flowering in March.

13. Melastoma Octandra. Leaves quite entire, three-nerved, ovate, smooth, hispid at the edge.—Native of the East Indies.

14. Melastoma Grossa. Leaves quite entire, five-nerved, subcordate, rugged. This tree has stiffish, round, hispid branches.—Found in New Granada by Mutis.

15. Melastoma Crispata. Leaves quite entire, five-nerved, in fours; branches curled.—Native of Amboyna.

16. Melastoma Glabra. Leaves quite entire, three-nerved, elliptic-lanceolate, rugged; calices cut round.—Native of the Society Isles.

17. Melastoma Grandiflora. Leaves cordate, five-nerved, serrulate, both they and the stem rough-haired; peduncles bifid, five stamina barren; branches herbaceous, four-cornered. The whole plant hairy.—Native of Cayenne.

18. Melastoma Septemnervia. Leaves seven-nerved, quite entire, lanceolate-ovate, hispid; stem shrubby, six feet high, upright.—Native of Cochin-china.

19. Melastoma Dodecandra. Leaves five-nerved, quite entire, smooth; flower twelve-stamined. This is a small shrub, about ten inches high, upright, even.—Native of China about Canton, and also of Cochin-china.

**Ten-stamined, with three-nerved Leaves.*

20. Melastoma Procera. Stem arboreous; leaves three-nerved, somewhat toothletted, smooth; raceme terminating; spikes simple, erect; calices truncated.—Native of the West Indies.

21. Melastoma Patens. Leaves three-nerved, somewhat toothletted, cordate, hirsute; raceme terminating, patulous; flowers distinct, twelve-stamined.—Native of the West Indies.

22. Melastoma Rigida. Leaves three-nerved, somewhat toothletted, ovate, subcordate, rigid, rugged behind; panicles terminating, ferruginous, hirsute.—Native of the W. Indies.

23. Melastoma Quadrangularis. Leaves three-nerved, entire, ovate-lanceolate, smooth; nerves coloured; branches quadrangular; racemes straight, terminating.—Native of the West Indies.

24. Melastoma Scandens. Leaves three-nerved, toothletted, ovate, acute, smooth; raceme terminating; spikes mostly pointing one way; stem climbing.—Native of the West Indies.

25. Melastoma Montana. Leaves three-nerved, toothletted, oblong, acute, smoothish; racemes terminating, with patulous spikes; petals retuse; calix truncated.—Native of the West Indies.

26. Melastoma Trinervia. Leaves three-nerved, without any marginal nerve, oblong, attenuated at the base and tip, entire, smooth on both sides, thinner; racemes almost simple, terminating.—Native of the West Indies.

27. Melastoma Ramiflora. Leaves three-nerved, entire, ovate-lanceolate, somewhat rugged; branches flower-bearing; flowers peduncled, somewhat clustered.—Native of the West Indies.

28. Melastoma Aromatica. Leaves ovate, shining, somewhat hairy underneath; nerves and stems strigose; calices with imbricate bractes at the base.—Native of Guiana.

29. Melastoma Crenata. Hispid: leaves subcordate, oblong, crenate, acuminate; racemes axillary, few-flowered, the length of the petiole.—Native of South America.

30. Melastoma Decussata. Leaves lanceolate-oblong, serrulate, ciliate, very smooth above; spikes racemed, two-parted; flowers clustered.—Native of Cayenne.

31. Melastoma Prasina. Leaves triple-nerved, quite entire, broad, lanceolate, smooth; panicle terminating, spreading very much.—Native of the West Indies.

***Ten-stamined, with five-nerved Leaves.*

32. Melastoma Elegans. Hispid: leaves cordate, unequally crenate-toothed; racemes in the forkings and terminating, few-flowered.—Native of Cayenne.

33. Melastoma Physiphora. Leaves ovate, attenuated, toothletted, ciliate; petioles hispid, bladdery at the tip.—Found in Cayenne and Guiana.

34. Melastoma Capitata. Leaves broad-lanceolate, quite entire; heads terminating, involucred; branches four-cornered; filamenta appendicled. The branches appear to be scandent.—Native of the West Indies.

35. Melastoma Argentea. Leaves five-nerved, somewhat toothletted, ovate, smooth, tomentose, and white underneath; panicles terminating, spreading. Trunk thick as a man's thigh; flowers white.—Native of the West Indies.

36. Melastoma Elata. Leaves five-nerved, serrate, toothletted, oblong, coriaceous, ferruginous-tomentose underneath; panicles terminating, spreading; flowers sessile.—Native of Jamaica.

37. Melastoma Tamonea. Leaves five-nerved, oblong-lanceolate, acute, entire, tomentose-hoary underneath; racemes compound, terminating; racemelets brachiate; bractes in pairs, under the flowers. This is a middle-sized tree, with a trunk four or five feet high, covered with a grey bark.—Native of Cayenne and Guiana.

38. Melastoma Albicans. Leaves five-nerved, entire, ovate, acute, smooth above, tomentose, whitish-ferruginous underneath; racemes terminating, erect; flowers clustered, sessile.—Native of Jamaica.

39. Melastoma Impetiolaris. Leaves five-nerved, toothletted, subsessile, oblong, acuminate, coriaceous-tomentose-ferruginous underneath; panicles terminating and axillary, erect.—Native of the West Indies.

40. Melastoma Splendens. Leaves five-nerved, entire, oblong, acuminate, smooth on both sides, shining above; panicles terminating above.—Native of Hispaniola.

41. Melastoma Coriacea. Leaves five-nerved, cartilaginous-toothletted, ovate, wrinkled, smooth, coriaceous; branches and petioles strigose; branches of the panicle four-cornered.—Native of Montserrat.

42. Melastoma Strigillosa. Leaves five-nerved, somewhat toothletted, acuminate, strigose-hairy above, tomentose underneath; racemes axillary, solitary; flowers pedicelled, clustered.—Native of the West Indies.

*** *Eight-stamined, with three-nerved Leaves.*

43. Melastoma Fascicularis. Leaves three-nerved, entire, ovate, acute, rugged; branches flower-bearing; flowers shortly peduncled, clustered.—Native of Jamaica.

44. Melastoma Angustifolia. Leaves three-nerved, linear-lanceolate, entire, hoary underneath; branches wand-like; panicles terminating; flowers erect.—Native of the West Indies.

45. Melastoma Micranthus. Leaves three-nerved, toothletted, oblong, acute, smooth; racemes axillary, reclining; flowers acuminate.—Native of the West Indies.

46. Melastoma Capillaris. Leaves three-nerved, somewhat toothletted, broad-lanceolate, attenuated, smooth; peduncles capillary, three-flowered, axillary.—Native of the West Indies.

47. Melastoma Rubens. Leaves three-nerved, toothletted, ovate-lanceolate, acuminate, very smooth; branches and petioles coloured; raceme terminating; flowers clustered, diœcous.—Native of the West Indies.

48. Melastoma Purpurascens. Leaves three-nerved, entire, oblong, acute, striated, very smooth; racemes lateral, patulous; flowers distinct.—Native of the West Indies.

49. Melastoma Glabrata. Leaves three-nerved, somewhat toothletted, ovate, acute, smooth, coriaceous; peduncles terminating, solitary, one-flowered.—Native of Jamaica.

50. Melastoma Alpina. Leaves three-nerved, entire, ovate, coriaceous, smooth; peduncles simply trichotomous; flowers distinct.—Native of the West Indies.

51. Melastoma Hirsuta. Leaves three-nerved, somewhat toothletted, broad-lanceolate, attenuated, hirsute; peduncles axillary, three-flowered, divaricated.—Native of Jamaica.

52. Melastoma Hirtella. Leaves three-nerved, hispid at the edge; peduncles very short, axillary, three-flowered.—Native of Jamaica.

53. Melastoma Microphylla. Leaves three-nerved, somewhat toothletted, ovate-obtuse, hispid above, tomentose underneath; peduncles trifid, axillary.—Native of the West Indies.

54. Melastoma Tetrandra. Leaves three-nerved, entire, oblong, acuminate, emarginate at the base, smooth, somewhat convex; raceme erect, terminating; flowers four-stamined.—Native of Jamaica.

55. Melastoma Triflora. Leaves elliptic-lanceolate, quite entire; branches, petioles, and calices, strigose; flowers axillary, subpeduncled, in threes. Branches obtusely quadrangular, covered at top.—Native of the Caribbee Islands.

**** *Eight-stamined, with triple-nerved Leaves.*

56. Melastoma Virgata. Leaves triple-nerved, entire, ovate, lanceolate, acuminate, very smooth; branches flower-bearing; racemes decussated, diffused, scattered.—Native of Jamaica.

57. Melastoma Æleagnoides. Leaves triple-nerved, entire, broad-lanceolate, whitish-tomentose underneath; peduncles terminating, trichotomous; flowers solitary.—Native of the West Indies.

58. Melastoma Acuminata. Leaves ovate, outwardly toothletted, acuminate, hoary underneath; corymbs terminating, fastigiate.—Native of Montserrat.

59. Melastoma Verticillata. Leaves ovate, oblong, attenuated, toothletted, villose, rugged above; racemes axillary; flowers in whorls.—Native of the Caribbee Islands.

60. Melastoma Lateriflora. Leaves obovate, acuminate, setaceous-subserrate, smooth; peduncles intrafoliaceous, aggregate, one-flowered. Stem from two to three feet high.—Found by Ryan in the island of Montserrat.

***** *Eight-stamined, with five-nerved Leaves.*

61. Melastoma Umbrosa. Leaves five-nerved, toothletted, broad-ovate, acuminate, rough-haired on both sides; branchlets flower-bearing; racemes dichotomous, spreading; branches and petioles hirsute.—Native of St. Christopher's.

62. Melastoma Pilosa. Leaves five-nerved, toothletted, oblong, acute, hirsute underneath; racemes lateral, hirsute.—Native of Jamaica.

63. Melastoma Hispida. Leaves five-nerved, somewhat toothletted, ovate-acute, strigose-hirsute above, netted-tomentose underneath; panicles terminating, divaricated.—Native of the West Indies.

64. Melastoma Aquatica. Leaves five-nerved, cordate-acute, crenulate, rough-haired above, even underneath; panicles terminating, trichotomous, diffused. Height about three feet; stem four-cornered.—Native of Cayenne and Guiana.

65. Melastoma Coccinea. Leaves elliptic-ovate, acuminate, smooth, quite entire; thyrse terminating; peduncles and pedicels knotted, hispid. This is a very beautiful shrub, from four to six feet high, with a regular head like an Orange-tree. The large scarlet flowers, in thyrses, cover the whole head. The leaves are wrinkled, and the flowers are sometimes white.—Discovered by Ryan in Montserrat.

66. Melastoma Sessiliflora. Villose-subtomentose: leaves lanceolate-ovate, toothletted, subpetioled; flowers axillary, sessile, in a sort of whorl.—Native of the West Indies.

There are many more species of this genus; some with ten stamens, and three and five nerved leaves, and others with twelve stamens. More might have been added, but the above are amply sufficient. Too much dependence must not be placed upon the smoothness or hairiness of the leaves, as they vary in that respect with soil and situation. There is great beauty in the diversity of the leaves, many of which are

very large, and most of them of different colours on the two surfaces, their under side being white, gold colour, or russet, and their upper of different shades of green. The flowers have no great beauty; but for the singularity of the leaves, these trees and shrubs deserve a place in all curious collections.

Melia; a genus of the class Decandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, very small, five-toothed, upright, blunt. *Corolla:* petals five, linear-lanceolate, spreading, long; nectary cylindric, one-leafed, the length of the corolla, with a ten-toothed mouth. *Stamina:* filamenta ten, very small, inserted within the apex of the nectary; antheræ not exceeding the nectary, oblong. *Pistil:* germen conical; style cylindric, the length of the nectary; stigma capitate, with five converging valves. *Pericarp:* drupe globular, soft. *Seed:* nut roundish, five-grooved, five-celled. Essential Character. *Calix:* five-toothed. *Petals:* five. *Nectary:* cylindric, bearing the antheræ at its mouth. *Drupe:* with a five-celled nucleus. ——The species are,

1. Melia Azedarach; *Common Bead-tree.* Leaves bipinnate; leaflets flat, shining, with ferruginous dots underneath. In warm countries this grows to a large tree, spreading out into many branches. The flowers come out from the side of the branches, in long loose bunches; petals blue. Fruit oblong, the size of a small cherry; nut four or five celled, with an oblong seed in each cell. The pulp surrounding the nut is poisonous, and, when mixed with grease, it is said to kill dogs. The Roman Catholics bore and string the nuts for beads.—Native of Syria; and now common in Spain and Portugal. It is propagated by seeds, which may be obtained from Italy or Spain, where these trees annually produce ripe fruits in the gardens where they are planted. The seeds or berries should be sown in pots filled with good light rich earth in the spring, and plunged into a moderate hot-bed of tanner's bark, where, if the seeds be fresh, they will come up in about a month or five weeks' time. When the plants are come up, they should be frequently watered, and should have a large share of free air by raising the glasses every day. In June they should be exposed to the open air, in a well-sheltered situation. In October the pots should be removed under a hot-bed frame, where they may enjoy free open air when the weather is mild, and be covered in hard frost. During the winter season they must be refreshed gently with water, but not too often, nor in large quantities. In March following you may shake out the plants from the seed-pots and divide them, planting each into a separate small pot, filled with light fresh earth, plunging them into a moderate hot-bed, which will greatly promote their rooting and increase their growth, but they must not be drawn too much; and in June you should remove them out into the open air as before, and during the three or four winters, while the plants are young, you must shelter them, to secure them from the cold; but when they are grown pretty large and woody, they will endure to be planted in the open air against a south wall. The best season for this is in April, at which time you should shake them out of the pots, being careful not to break the earth from their roots, but only pare off with a knife the outside of the ball of earth; then open your holes and put in the plants, closing the earth to their roots, observing, if the weather be dry, to give them some water, which should be repeated twice a week until the plants have taken root; but you must observe to plant them on a dry soil, otherwise they will be liable to miscarry in severe frosty weather.

2. Melia Sempervirens; *Evergreen Bead-tree.* Leaves bipinnate; leaflets somewhat wrinkled, commonly seven. This is suspected to be a variety of the preceding species.—Native of the East Indies.

3. Melia Azedirachta; *Ash-leaved Indian Bead-tree.* Leaves pinnate. This becomes a large tree in India; the stem is thick; the wood of a pale yellow; and the bark of a dark purple colour, and very bitter.—Native of the East Indies. This sort is now very rare in England; and also in the Dutch gardens, where some years past it was more common: it is propagated by seeds in the same way as the other sort, but being much tenderer, the plants should be kept constantly in the tan-bed while young. In the summer they may be placed under a frame, but in winter they must be removed into the bark-stove, and treated in the same way with other plants from the same countries. When they have acquired strength, they may be treated more hardily, by placing them in winter in a dry-stove, and in the middle of summer they may be placed abroad for two or three months in a warm sheltered situation; and during the winter season they should be sparingly watered: with this management the plants will produce flowers annually, and, as they retain their leaves all the year, they are ornamental in winter in the stove.

Melianthus; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth large, five-parted, coloured, unequal; the two upper segments oblong, erect; the lowest very short, like a bag, gibbous downwards; the middle segments opposite, inferior, lanceolate; the uppermost simple, erect. *Corolla:* petals four, lanceolate-linear, with the tops reflex, from parallel spreading, turned outwards, forming the lower lip, as the calix itself does the upper, connected at the sides in the middle; nectary one-leafed, placed within the lowest segment of the calix, and fastened to it with the receptacle, very short, compressed at the sides, gashed at the edge, turned downwards by the back. *Stamina:* filamenta four, awl-shaped, upright, the length of the calix; the two lower shorter, united at the base; antheræ cordate-oblong, four-celled in front. *Pistil:* germen four-cornered, gibbous, four-toothed; style upright, awl-shaped, of the same length and in the same situation with the stamina; stigma four-cleft, with the upper segment larger. *Pericarp:* capsule quadrangular, half four-cleft; angles sharp, distant; cells inflated; partitions open in the centre for a receptacle of the seeds, gaping between the angles. *Seeds:* in fours, subglobular, annexed to the centre of the capsule. Essential Character. *Calix:* five-leaved, the lower leaf gibbous. *Petals:* four, with the nectary within the lowest.——The species are,

1. Melianthus Major; *Great Honey-flower.* Stipules solitary, fastened to the petiole. Root woody, perennial, spreading; stems many, woody, four or five feet high, herbaceous towards the top; leaves large, embracing the stem at the base; spikes long; corolla brown.—Native of the Cape. This plant, which if in flower distils a shower of nectar when shaken, was formerly preserved in the green-house as a tender exotic, but if planted in a dry soil and warm situation, it will endure the cold of our ordinary winters very well; and if in a severe frost the tops should be destroyed, yet the roots will abide, and put forth again in the succeeding spring. It may be propagated by taking off its suckers or side shoots, any time from March to September, observing to chuse such as are furnished with fibres; and, after they are planted and have taken root, they will require no further care but to keep them clear from weeds: they may be also propagated by planting cuttings, during any of the summer months, which, if watered and shaded, will root very well, and may afterwards be transplanted where they are designed to remain.

2. Melianthus Minor; *Small Honey-flower.* Stipules in

pairs, distinct; racemes axillary, elongated; flowers in whorls; bractes linear, elongated. The stem, which is shrubby, and from three to five feet high, during the flowering season is apt to exhibit a naked appearance, having then fewer leaves on it, and those not of their full size; the foliage has an unpleasant smell, and the nectar does not flow so copiously as in the preceding sort, but is retained at the bottom of the corolla.—Native of the Cape. This is not spreading like the first, and is not propagated so easily; but cuttings planted upon an old hot-bed, the heat of which is over, and covered close with bell or hand glasses to exclude the air, will take root pretty freely; these may be planted in pots, and sheltered in the winter under a common frame for a year or two, till they have obtained strength; then they may be planted in a warm border, and treated in the same way as the former sort; with which management they flower much better than any of those which have been more tenderly treated. All the sorts succeed best in a dry soil, and warm situation.

3. Melianthus Comosus; *Tufted Honey-flower.* Stipules distinct; racemes infrafoliaceous; flowers alternate; bractes cordate; leaves villose above. Stem upright, branched, four feet high, round; flowers in pendent clusters, of a yellow colour.—Native of the Cape.

Melica; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume two-flowered, two-valved; valves ovate, concave, nearly equal. *Corolla:* two-valved; valves ovate, awnless; one concave, the other flat and smaller; a corpuscle between the florets, turbinate, pedicelled; nectary one-leafed, horizontal, surrounding the germen, fleshy. *Stamina:* filamenta three, capillary, thickened at the base, connate, the length of the flower; antheræ oblong, forked at each end. *Pistil:* germen obovate, turbinate; styles two, bristle-shaped, spreading, naked at the base; stigmas oblong, feathered. *Pericarp:* none; corolla enclosing and dropped the seed. *Seed:* single, ovate, grooved on one side. *Observe.* The peduncled corpuscle, which is the rudiment of a flower, gives the essential character; it consists of two rudiments, or truncated alternate florets, with convoluted pellucid glumes. The stamina also are dilated at the base, and connate with a one-leafed nectary. Essential Character. *Calix:* two-valved, two-flowered; with the rudiments of one or two florets that are abortive between the two others.—These Grasses are easily propagated by seed, or by parting the roots in autumn. None of them are cultivated for feeding cattle, though some say that the first and sixth species are both very agreeable to sheep. The latter, and also the seventh species, together with some of the Cape species, are elegant Grasses, and deserve a place in curious gardens.——The species are,

1. Melica Ciliata; *Fringed Melic Grass.* The outer petal of the lower floret ciliate. Root perennial; culms several, upright, from two to three feet high, round, smooth, with seven smooth purple joints.—Native of the North of Europe.

2. Melica Gigantea; *Gigantic Melic Grass.* Corollas hirsute, awned; panicle whorled; culm upright.—Native of the Cape.

3. Melica Geniculata; *Jointed Melic Grass.* Corollas rough-haired; panicle contracted; culm decumbent.—Native of the Cape.

4. Melica Decumbens; *Prostrate Melic Grass.* Corollas hirsute; flowers racemed, nodding; culm decumbent.—Native of the Cape.

5. Melica Racemosa; *Racemed Melic Grass.* Corollas rough-haired; racemes drooping; culm erect.—Native of the Cape.

6. Melica Nutans; *Mountain Melic Grass.* Petals beardless; panicle nodding, simple. Root perennial, somewbat creeping; culms a foot or a foot and half high, simple, upright, rugged, striated, somewhat angular, below purplish. It flowers in July and August. Native of many parts of Europe, particularly the northern countries, in rocky and shady situations. It is found in Yorkshire, Westmoreland, and Cumberland; and also in Scotland.

7. Melica Uniflora; *Single-flowered Wood Melic Grass.* Panicle thin; calices two-flowered, one floret hermaphrodite, the other neuter. Root perennial; culm simple, a foot and half or more in height, where it is covered with the sheaths of the leaves, somewhat angular, rugged, and striated, at bottom of a dull purple colour. The delicacy and striking colour of the panicle, joined to its place of growth in woods, readily distinguish this from all our other grasses.—Native of Sweden, Germany, Switzerland, France, and England: it is found in most of the woods near London; and in Mungewell, Ardley, and Stokenchurch woods, in Oxfordshire, &c.

8. Melica Ramosa; *Branching Melic Grass.* Corollas smooth, awnless; panicle contracted; culm branched.—Native of the Cape.

9. Melica Capensis; *Cape Melic Grass.* Corollas smooth, awnless; panicles spreading very much; leaves subfiliform.—Native of the Cape.

10. Melica Minuta; *Small Melic Grass.* Culm branched; leaves bristle-shaped; petals beardless.—Native of Italy.

11. Melica Cœrulea; *Purple Melic Grass.* Panicle contracted; flowers cylindrical. Root perennial, thick, whitish, or brownish, flexuose, and villose. This grass is easily known by its having only one knot, and that near the base; and by the stamina and stigma being of a deep purple colour. Merret's name of *Gramen Spica Lavendulæ* is very expressive of its appearance when in flower. It varies greatly in size, and being harsh and late, does not seem adapted to agricultural purposes. The fishermen in the isle of Sky make ropes for their nets of this grass.—It is common on wet moors and heaths, flowering from July to the end of September.

12. Melica Papilionacea; *Pea-flowered Melic Grass.* Lower valve of the calix very large, coloured: outer petal subciliate.—Native of Brazil.

13. Melica Altissima; *Tall Melic Grass.* Petals beardless; panicle contracted, directed one way.—Native of Siberia.

14. Melica Falx. Spike directed one way, compressed, imbricate; leaves on the culm two, alternate. Flowers pubescent, with a white edge.—Native of the Cape.

15. Melica Mutica. Panicles loose, with few flowers; branchlets simple; flowers obtuse; stalk erect, glabrous. It flowers in July.—Found in shady places from Virginia to Florida.

Melicocca; a genus of the class Octandria, order Monogynia; or, according to Swartz, of the class Polygamia, order Dicœcia.—Generic Character. *Calix:* perianth four-parted; leaflets ovate, concave, blunt, spreading. *Corolla:* petals four, oblong, equal, bent back entirely among the leaflets of the calix. *Stamina:* filamenta eight, awl-shaped, upright, short; antheræ oblong, upright. *Pistil:* germen ovate, almost the length of the corolla; style very short; stigma large, subpeltate, extended on both sides, oblique. *Pericarp:* drupe barked, roundish, bluntly acuminate. *Seed:* nut coriaceous, roundish, smooth. *(Gærtner.)* Essential Character. *Calix:* four-parted. *Petals:* four, bent back below the calix. *Stigma:* subpeltate. *Drupe* or *Berry:* coriaceous.——The only species known is,

1. Melicocca Bijuga. This is a tree, with a middle-sized unarmed trunk; branches spreading; drupe twice as large as a nutmeg, with a thin and somewhat brittle bark covering the nut, which has a sweet and gelatinous substance in it, like the yolk of an egg. Jacquin was informed at Curaçoa

that there were male and female trees; but Swartz has ascertained that one tree bears hermaphrodite flowers, another male flowers, and that the latter are most common. They flower in April, and the fruit is ripe about Midsummer.—Native of South America; and cultivated in the East Indies. Browne says it was brought to Jamaica from Surinam; that it thrives well in the low lands about Kingston, rising sometimes to the height of sixteen or eighteen feet, or more; that the fruit is very mellow, and grows to the size of a large plum; and that it seldom brings more than one stone or seed to perfection. He calls it Genip Tree, which is derived from the Dutch *knippen:* the Spaniards call it, *Monos.*

Melicope; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four-parted, permanent. *Corolla:* petals four, ovate-oblong, acute, longer than the calix; nectary glands four, large, twin, surrounding the germina. *Stamina:* filamenta eight, awl-shaped, erect, shorter than the corolla, inserted into the receptacle on the outside of the nectary; antheræ subcordate, erect. *Pistil:* germina four, superior; style filiform, longer than the stamina, deciduous; stigma four-cornered, flatted, concave at the centre. *Pericarp:* capsules four, elliptic, compressed, divaricated, one-celled, gaping at the upper margin. *Seeds:* solitary, elliptic, compressed. Essential Character. *Calix:* inferior, four-leaved. *Petals:* four. *Nectary:* glands four, twin. *Capsule:* four, one-seeded.——The only known species is,

1. Melicope Ternata. A shrub, with smooth round leafy branches.—Native of New Zealand.

Melicytus; a genus of the class Diœcia, order Pentandria. *Male. Calix:* perianth five-toothed, very short. *Corolla:* petals five, ovate, acute, horizontal, longer than the calix; nectary, scales five, clubbed, cup-shaped, excavated at top, staminiferous on the inside, upright. *Stamina:* filamenta none; antheræ five, ovate-roundish, four-grooved in front, fastened longitudinally to the nectaries within, and a little longer. *Female. Calix* and *Corolla:* as in the males; nectary, five scales, triangular, acute, incumbent on the germen, shorter than the calix. *Pistil:* germen ovate; style very short; stigma flat, four or five lobed; lobes rounded, small. *Pericarp:* capsule berried, globular, smooth, coriaceous, one-celled, four or five valved. *Seeds:* about five, convex on one side, angular on the other, nestling in the pulp. Essential Character. *Calix:* five-toothed. *Corolla:* five-petalled, three times as long as the calix. *Nectary:* five scales. *Male. Antheræ:* five, without filamenta, fastened to the inside of the nectary. *Female. Stigma:* flattened out, four or five lobed. *Capsule:* berried, one-celled. *Seeds:* nestling.——The only known species is,

1. Melicytus Ramiflorus. A shrub or tree with round smooth leafy branches, and numerous whitish flowers.—Native of New Zealand.

Melilot. See *Trifolium.*

Melissa; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, subcampanulate, dry, scariose, spreading a little, angular, striated, permanent, with a two-lipped mouth; upper lip three-toothed, reflex, spreading, flat; lower lip shorter, sharpish, two-parted. *Corolla:* one-petalled, ringent; tube cylindrical; throat gaping; upper lip shorter, erect, arched, roundish, bifid; lower lip trifid; middle segment larger, cordate. *Stamina:* filamenta four, awl-shaped, two the length of the corolla, two shorter by half; antheræ small, converging, in pairs. *Pistil:* germen four-cleft; style filiform, the length of the corolla, inclining along with the stamina, beneath the upper lip of the corolla; stigma slender, bifid, reflex. *Pericarp:* none. *Calix:* larger, unchanged, fostering the seeds in its bosom. *Seeds:* four, ovate. Essential Character. *Calix:* dry, flattish above; upper lip subfastigiate. *Corolla:* upper lip somewhat arched, bifid; lower lip with the middle lobe heart-shaped.——The species are,

1. Melissa Officinalis; *Officinal* or *Common Garden Baum,* or *Balm.* Racemes axillary, whorled; pedicels simple. Root perennial; stalk annual, square, branching, from two to three feet high; leaves by pairs at each joint; flowers in loose small bunches from the axils, in whorls, white or yellowish, appearing in July. The herb in its recent state, has a weak, roughish, aromatic taste, and a pleasant smell, somewhat of the lemon kind, and hence this species has been denominated, *Melissa odore Citri.* On distilling the fresh herb with water, it impregnates the first runnings pretty strongly with its grateful flavour; and when large quantities are employed in this way, there separates and rises to the surface of the aqueous fluid, a small portion of essential oil, in colour yellowish, and of a very fragrant smell. Balm was formerly esteemed of great use in all complaints supposed to proceed from a disordered state of the nervous system, according to Paracelsus, Hoffman, and Boerhaave, who inclined to the opinion of the Arab physicians, and deemed it an efficacious remedy. Others speak of its effects as an emmenagogue: but neither this nor any other medicinal power is now attributed to Balm. As tea, however, it makes a grateful diluent drink in fevers, and is thus used, either by itself or acidulated with lemons. The essential oil probably possesses no qualities different from many other aromatics and cordials. From the fondness of bees for this plant, it has been named *Apiastrum Melissa, Melissophyllum,* and by contraction *Melisphyllum,* and was directed by the ancients, among other herbs, to be rubbed upon the hive to render it agreeable to the swarm. It is known by its Greek name Melissa in all the languages of Europe, except the Danish, in which it is called *Hiertensfryd.* Mr. Miller makes a distinct species of the *Roman Baum,* which grows naturally about Rome and in other parts of Italy. The stalks are slender, the leaves much shorter, the whole plant hairy, and of a strong disagreeable odour: the flowers grow in whorls, sitting pretty close to the branches, and are smaller than those of the common sort.—Balm is a native of the southern parts of Europe, especially in mountainous situations, as in Switzerland, Carniola, Silesia, the south of France, and in Italy. It was introduced into our gardens at an early period. This and the next plant are easily propagated by parting the root in October, time enough for the offsets to be established before the frosts come on. The roots may be divided into small pieces with three or four buds to each, and planted two feet apart in beds of common garden earth. The only culture they require is to keep them clean from weeds, and to cut off the decayed stalks in autumn, and then stirring up the ground between them.

2. Melissa Grandiflora; *Great-flowered Balm.* Flower-stalks axillary, forked, longer than the footstalks; bractes lanceolate, sessile; leaves ovate, serrated. Root perennial; stalk annual, rising about a foot high; flowers large, purple coloured. It flowers in June, and the seeds ripen in August. The leaves when bruised have the smell of Garden Baum. There is a variety with white, and another with red flowers, both much inferior to the purple; and it also has variegated leaves like the preceding.—Native of the southern parts of Europe.

3. Melissa Calamintha; *Mountain Balm,* or *Calamint.* Peduncles axillary, dichotomous, the length of the leaves; lower lip of the calix longer than the upper segments. Root perennial; stem upright, four-cornered, woolly. A strong infusion made of the dried leaves of this plant is serviceable

in weakness of the stomach, and removes the pains and obstructions of the bowels: it is likewise good in hysterical complaints, and suppressions of the menses. A conserve made of the young tops may be used for the same purposes, and will be found equally efficacious. It flowers in August.—Native of many parts of Europe, as in Italy, Spain, France, Switzerland, Austria, and England, by the sides of walls and in corn-fields. It may be increased and treated nearly in the same manner as the first species.

4. Melissa Nepeta; *Field Balm*, or *Calamint*. Peduncles axillary, dichotomous, longer than the leaf; calicine segments equal. Root perennial, somewhat oblique, crooked, round, woody, brown; stems woody, divided just above the base into branches, which are from one to two feet in length, ascending, obscurely quadrangular, reddish towards the base, beset with soft horizontal hairs. Both this and the preceding species seem to have been used indifferently in the old practice of medicine, under the name of *Calamintha*. They have a strong aromatic smell, approaching to that of Pennyroyal, and a moderately pungent taste, somewhat like Spearmint, but warmer. Infusions of the leaves, given as tea in weaknesses of the stomach, flatulent colics, and uterine obstructions, are very useful. Propagated nearly in the same manner as the first species.

5. Melissa Cretica; *Cretan Balm*. Racèmes terminating; peduncles solitary, very short. Stems slender, a little woody; flowers small.—Native of the south of Europe. If the seeds of this be permitted to scatter, there will be a sufficient supply of young plants.

6. Melissa Fruticosa; *Shrubby Balm*. Branches attenuated, rod-like; leaves tomentose underneath; stem shrubby. The whole plant has a strong scent of Pennyroyal, and is of short duration.—It may be increased by seeds, or by cuttings, planted in any of the summer months, and shaded from the sun. On a warm border they will frequently live through the winter; but it is prudent to keep a plant or two in pots, sheltered under a frame in winter.

Melittis; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, round, straight, with a two-lipped mouth; upper lip higher, emarginate, acute; lower shorter, bifid, acute, with the divisions gaping. *Corolla:* one-petalled, ringent; tube much narrower than the calix; opening scarcely thicker than the tube; upper lip erect, roundish, entire; lower spreading, trifid, blunt; middle segment larger, flat, entire. *Stamina:* filamenta four, awl-shaped, under the upper lip, the middle ones shorter than the two outer; antheræ converging by pairs in form of a cross, bifid, blunt. *Pistil:* germen blunt, four-cleft, villose; style filiform, the length and situation of the stamina; stigma bifid, acute. *Pericarp:* none; calix unchanged, containing the seeds at the bottom. *Seeds:* four. *Observe.* The lower lip of the calix is sometimes crenated. Essential Character. *Calix:* wider than the tube of the corolla. *Corolla:* upper lip flat, lower crenated. *Antheræ:* crosswise.——The species are,

1. Melittis Melissophyllum; *Bastard Balm*. Leaves elliptic. Root perennial, sending up in the spring three, four, or more stems, a foot and half high or more, upright, with a few branches at the base. Flowers large, handsome, growing chiefly on one side, in half whorls, about six flowers together; corolla slightly villose, white stained with purple. Clusius mentions a variety in all respects smaller: it is a native of Switzerland and Austria. Mr. Curtis remarks, that the cruciform appearance of the antheræ ought not to form a part of the essential character, being common to many of the didynamous plants: we may add, that it is a character which is only apparent for a short time. Most authors describe the Melittis as having an unpleasant smell: the fresh herb when bruised partakes of the scent of Balm and of Stinking Horehound, (see *Ballota*;) but when dried it becomes delightfully fragrant; the flowers, when they first open, are odoriferous. Much honey is secreted from a gland that encircles the base of the germen; hence this is a favourite plant with bees, and it accords well with its name Melittis.—It flowers in May or June, and is a native of several parts of Europe. It occurs only in the west of our island, as about Totness, Barnstaple, &c. in Devonshire; in the New Forest, Hampshire; and about Haverfordwest in Pembrokeshire, South Wales, in woods and shady places. It is a handsome plant, continuing in flower three weeks or a month, unless the season be very hot. As it rarely produces good seeds in the gardens, it is usually propagated by parting the roots; but where the plants are intended for ornament, the roots should not be disturbed oftener than every third year; nor should they then be divided into small parts, lest it prevent them from flowering the first year. The best time to remove and part the roots is the beginning of October, that they may have time to get root before the frosts come on. They should have a loamy soil, and an eastern exposure, where they will thrive and flower plentifully.

2. Melittis Japonica. Leaves alternate, ovate, obtuse, unequally serrate; calix villose. Stem upright, villose, simple, a span high.—Native of Japan.

Melochia; a genus of the class Monadelphia, order Pentandria.—Generic Character. *Calix:* perianth often double; outer one-sided, three-leaved; inner one-leafed, half five-cleft; segments half ovate, acute, permanent. *Corolla:* petals five, obcordate, spreading, large. *Stamina:* filamenta five, awl-shaped, united at the base into a pitcher, involving the germen; antheræ simple. *Pistil:* germen roundish; styles five, awl-shaped, erect, the length of the stamina, permanent; stigmas simple. *Pericarp:* capsule roundish or five-cornered, five-celled, five-valved; valves acute; partitions contrary, doubled. *Seeds:* solitary, or in pairs, on one side roundish, on the other angular, compressed. *Observe.* The calix in some species is double, in others single. Essential Character. *Styles:* five. *Capsule:* five-celled, one-seeded.—To propagate the plants of this genus, sow the seeds on a hot-bed; and when the plants come up, treat them in the same manner as is directed for *Sida*. The shrubby sorts may with care be preserved through the winter in a stove, whereby good seeds may be obtained; for they seldom ripen their seeds well the first year, unless the plants be brought forward early in the spring, and the summer proves warm. The other sorts generally ripen their seeds the same year they are sown.——The species are,

1. Melochia Pyramidata; *Pyramidal Melochia*. Flowers umbelled; capsules pyramidal, five-cornered; angles mucronate; leaves naked. Stem shrubby at the base, branched, a foot high; corollas small, blood-red, frequently closed. Browne describes it as a very elegant little plant, about three feet high.—Native of Brazil and Jamaica.

2. Melochia Tomentosa; *Downy Melochia*. Flowers umbelled, axillary; capsules pyramidal, five-cornered; angles mucronate; leaves tomentose. This is an upright shrub, little branched, only three feet high in open rocky situations, but seven feet high in woods.—Native of Jamaica, Martinico, St. Martin's, and other islands of the West Indies.

3. Melochia Crenata; *Notch-leaved Melochia*. Leaves roundish, crenate, tomentose, marked with lines; umbels axillary and terminating, peduncled. This shrub has a purplish bark, and alternate, villose-tomentose, hoary branches.—Native of South America.

4. Melochia Depressa; *Flat-fruited Melochia.* Flowers solitary; capsules depressed, five-cornered; angles blunt, ciliate; stalk shrubby. Browne says, it commonly rises to the height of two or three feet, throwing out a few slender flexile branches on all sides; the leaves spread themselves every day about noon, to receive the heat of the sun more freely, but as the air grows cooler, they generally rise upright, and stand almost parallel to the stem or branches; this mechanism of the leaves is greatly forwarded by the knee in the footstalk of each.—Found in Jamaica, &c.

5. Melochia Venosa; *Veiny-leaved Melochia.* Peduncles distinct, terminating, many-flowered; leaves ovate, serrate, veined, tomentose underneath; stem hairy, four feet high; flowers in clusters, yellow.—Found in South America, &c.

6. Melochia Concatenata. Racemes clustered, terminating; capsule globular, sessile. A perennial upright smooth plant, with stiff branches.—Native of the East Indies.

7. Melochia Nodiflora. Flowers conglobate, axillary; capsules globular; leaves ovate, acuminate, smooth.—Native of most of the West India Islands.

8. Melochia Lupulina. Racemes clustered, axillary; calices inflated, membranaceous; leaves ovate cordate, gash-serrate, tomentose underneath.—Native of Jamaica.

9. Melochia Corchorifolia; *Red Melochia.* Flowers in sessile heads; capsules roundish; leaves subcordate, sublobate. An annual plant; with hardish, and diffused, rugged, rod-like branches; corollas pale, with a yellow bottom.—Native of the East Indies.

10. Melochia Supina; *Prostrate Melochia.* Flowers in heads; leaves ovate, serrate; stems procumbent. An annual plant, with trailing stalks.—Native of the East Indies.

11. Melochia Odorata; *Sweet-scented Melochia.* Panicles peduncled, compound; leaves ovate, subcordate, sublobate, biserrate, smooth. Forster's specific character is: Cymes corymbed, axillary; leaves cordate, acuminate, serrate. A smooth plant; flowers large.—Native of the islands of Tanna and Tongataboo in the South Seas.

Melodinus; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, permanent; leaflets ovate, lying over each other at the edge. *Corolla:* one-petalled, salver-shaped; tube cylindrical, three times as long as the calix; border five-parted, flat; segments sickle-shaped, crenulate, twisted to the right, shorter than the tube; nectary in the mouth of the tube, stellate; segments five, cloven, lacerated. *Stamina:* filamenta five, awl-shaped, very short, in the middle of the tube; antheræ ovate. *Pistil:* germen globular, superior; style round, the length of the calix, bipartile; stigma conical, acute. *Pericarp:* berry fleshy, globular, many-seeded, with a fleshy partition. *Seeds:* numerous, ovate-roundish, flatted a little, nestling. Essential Character. *Corolla:* contorted. *Nectary:* in the middle of the tube, stellate. *Berry:* two-celled, many-seeded.——The only species is,

1. Melodinus Scandens. A very smooth shrub with a climbing stem; leaves oblong, ovate veined, quite entire, very smooth, opposite. It has great affinity to Rauwolfia.—Native of New Caledonia.

Melon. See *Cucumis.*

Melonary,—The portion of ground in the kitchen garden principally allotted for the business of early and general hot-bed work, in the culture of Melons and Cucumbers, as well as occasionally in other framing culture. These Compartments are mostly enclosed by some sort of fence, and are particularly convenient and useful, as in the practice of hot-bed culture there is unavoidably a considerable littering occasioned at times, by means of the necessary supplies of hot dung, straw, litter, and other materials, both in the making of the beds and after culture, which by this means being confined to a particular part, the whole is performed more conveniently, and without incommoding the economy of the other parts of the garden. They are also very useful when properly chosen in the driest and warmest situations, in the advantage of having the hot-beds on dry ground, and sheltered from cutting winds, with the full benefit of the whole day's sun, as well as in being more secure. In considerable gardens, the places allotted for this use are sometimes of such extent, as to have the hot-houses, or forcing-houses, and other appurtenances of that kind, where culture by artificial heat is required, near together, by which time and trouble is saved, and great advantage in other respects gained. In the choice of a place for this purpose, some part of the warmest, best-sheltered, dry quarter of the garden, which is well defended from the northerly and north-easterly winds, not liable to inundation or the stagnation of water, and conveniently situated for bringing in dung, tan, earth, &c. should be selected. It will be more proper still, if, with these advantages, it lie a little higher, or very gently sloping towards some lower part, especially when towards the full sun from rising to setting, so as to admit of ranging the hot-beds longitudinally east and west, or as nearly in that direction as possible. With respect to the extent or dimensions, they muct be according to the quantity of hot-bed framing required, as from two or three to five or ten rods square, or to that of a quarter or half an acre, or more; in which, besides the part immediately allotted for the hot-beds, it is convenient to have room for the previous preparation of the dung, &c. for earthing the beds. The most eligible form is an even or an oblong square. When enclosed, the fences may be six, seven, or eight feet high, in the northerly or back part, and five or six in front, the sides corresponding, though when extensive they may be nearly of equal height all round. The internal part, or place where the hot-beds are, even when dry, should be a little elevated, to throw off the water in heavy rains, and, when unavoidably low or liable to be wet in winter or spring, be raised, with some dry materials, considerably above the general level, that the hot-beds may stand dry, as well as to afford advantage in performing the business of cultivation. The ground for the immediate place of the hot-beds may generally remain even or level; some however form shallow trenches the width and the length of the intended hot-beds, as from six to twelve inches deep, and make the lower part of the bed in the trench; which, however, is more proper in a dry or somewhat elevated situation, than in low or wet ground, as water is apt to settle in the bottom, and chill the beds by suddenly reducing the heat. Besides, by having the beds wholly above the ground, there is a better opportunity of applying the occasional linings quite from the bottom upwards. By proper attention in the construction of the different parts of these grounds, and in the building of the fence, they may be also rendered highly useful in raising varous kinds of fruit, which could not otherwise be the case.

Melon Thistle. See *Cactus.*

Melothria; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, ventricose, five-toothed, superior, deciduous. *Corolla:* one-petalled, wheel-shaped; tube the length of the calix, and fastened all round to it; border five-parted, flat; segments broader outwards, very blunt. *Stamina:* filamenta three, conical, inserted into the tube of the corolla, and of the same length; antheræ twin, roundish, compressed. *Pistil:* germen ovate-oblong, acuminate, subinferior; style cylin-

dric, the length of the stamina; stigmas three, thickish, oblong. *Pericarp:* berry ovate-oblong, internally without the partitions, three-parted. *Seeds:* several, oblong, compressed. ESSENTIAL CHARACTER. *Calix:* bell-shaped, five-cleft. *Corolla:* wheel-shaped, one-petalled. *Berry:* three-celled, many seeded.——The only known species is,

1. Melothria Pendula; *Small Creeping Cucumber*, or *American Bryony*. It grows wild in the woods of Carolina, Virginia, and also in many of the American islands; creeping upon the ground with slender vines, having angular leaves, somewhat resembling those of the Melon, but much smaller. These vines strike out roots at every joint, which fasten themselves into the ground, and thereby a larger share of nourishment is drawn to the plants, by which means their stalks extend to a great distance each way, and closely cover the ground. The flowers are very small, in shape like those of the Melon, and of a pale sulphur colour. The fruit in the West Indies grows to the size of a pea, of an oval figure, and changes black when ripe, and the inhabitants sometimes pickle them when green. In England, the fruit are much smaller, and are so hidden by the leaves, that it is difficult to find them.—The plants will not grow in the open air of our climate, the seeds must therefore be sown upon a hot-bed, and if the plants be permitted, will soon overspread the surface of a large bed; and when the fruit is ripe, if it scatter the seeds, the plants will come up where the earth happens to be used on a hot-bed again, and if they are supplied with water, will require no further care.

Memecylon; a genus of the class Octandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth undivided, superior, bell-shaped, turbinate, quite entire, with a pitcher-shaped, striated base, permanent. *Corolla:* petals four, ovate, acute, spreading. *Stamina:* filamenta eight, erect, widened and truncated at top; antheræ simple, inserted by their sides into the apex of the filament. *Pistil:* germen turbinate, inferior: style awl-shaped; stigma simple. *Pericarp:* berry crowned with a cylindrical calix. *Seeds:* not described. ESSENTIAL CHARACTER. *Calix:* superior, with a striated base, and the margin quite entire. *Corolla:* four-petalled. *Antheræ:* inserted into the side of the apex of the filament. *Berry:* crowned with a cylindrical calix. ——The species are,

1. Memecylon Capitellatum. Leaves ovate, bluntish; heads axillary, subpeduncled. This is a tree, with round branchlets.—Native of Ceylon.

2. Memecylon Grande. Leaves ovate, acuminate; peduncles axillary, with many-flowered pedicels. This is a large tree, with round branches.—Native of the East Indies.

3. Memecylon Umbellatum. Berry inferior, globular, crowned with the calix, permanent, tubular, eight-streaked within; cuticle coriaceous, thin; pulp watery, fugaceous.—Native place not stated.

4. Memecylon Edule. Leaves ovate, acute; umbellets compound, naked. This is a very common tree, or large shrub, in every jungle on the coast of Coromandel. It flowers about the beginning of the hot season. The ripe berries are eaten by the natives: they contain a large quantity of bluish black pulp of an astringent quality.

Four other species of Memecylon have been described by Botanists; which we omit.

Menais; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth three-leaved; leaflets concave, lax, acuminate, small, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindrical, longer than the calix; border flat, five-parted, with rounded segments. *Stamina:* filamenta five, very short, inserted into the tube; antheræ awl-shaped, at the throat of the corolla. *Pistil:* germen roundish; style filiform, the length of the tube; stigmas two, oblong. *Pericarp:* berry globular, four-celled. *Seeds:* solitary, subovate, sharp at one end. ESSENTIAL CHARACTER. *Calix:* three-leaved, *Corolla:* salver-shaped. *Berry:* four-celled. *Seeds:* solitary.——The only known species is,

1. Menais Topiaria. A shrub, with alternate, ovate, entire, rough leaves; and round, somewhat villose stems.—Native of South America.

Meniscium; a genus of the class Cryptogamia, order Filices, or Ferns.—ESSENTIAL CHARACTER. Capsules heaped in crescents, interposed between the veins of the fronds.——There are five species, the first of which only we shall describe:

1. Meniscium Reticulatum. Root fibrous, black; fronds several, pinnate, four feet long; stipe black, grooved in front, angular, brown, appearing somewhat villose when magnified; pinnas very many, alternate, with an odd one, on short petioles, from an ovate base, long, lanceolate-acuminate, crenate, a little sickle-shaped at the end, smooth above, somewhat villose along the nerves underneath, from six to nine inches long, an inch or an inch and half wide. The midrib is prominent at the back, and at a very obtuse angle puts forth on both sides towards the edges numerous parallel nerves, which are also prominent: these are connected by several arched veins; whence the pinnas seen against the light appear like beds in a parterre. On these veins are placed as many arched, oblong, parallel, dark, rufous fructifications, composed of very minute shining globules, those which are next the midrib larger. They are not so close upon the whole as in most of the Aspleniums; and even sometimes exhibit distinct globules thinly placed.—Native of Martinico, Brazil, &c.

Menispermum; a genus of the class Dicœcia, order Dodecandria.—GENERIC CHARACTER. *Male: Calix:* perianth two-leaved; leaflets linear, short. *Corolla:* petals, outer six, ovate, spreading, equal; inner eight, obcordate, concave, smaller than the outer, four of them in the inner row wider. *Stamina:* filamenta sixteen, cylindric, a little longer than the corolla; antheræ terminating, very short, bluntly four-lobed. *Female. Calix* and *Corolla:* as in the male. *Stamina:* filamenta eight, like those of the male; antheræ pellucid, barren. *Pistil:* germina two or three, ovate, curved inwards, converging, pedicelled; styles solitary, very short, recurved; stigmas bifid, blunt. *Periearp:* berries two or three, roundish kidney-form, one-celled. *Seeds:* solitary, kidney-form, large. *Observe.* The above character is taken from the Menispermum Canadense, and should be compared with the fructifications of the other species: the calix being six-leaved, the corolla six-petalled, six stamina, and three pistilla, according to Willich, Miller, and others; or, according to Walter, the calix three-leaved, petals three, scales of the nectary six, six stamina, six germina, without any styles, and six berries. ESSENTIAL CHARACTER. *Male. Petals:* four outer, eight inner. *Stamina:* sixteen. *Female. Corolla:* as in the male. *Stamina:* eight, barren. *Berries:* two, one-seeded. Gærtner remarks, that the species of this genus vary much in their number, in the flower and fruit; but that they all not only agree in the position of the cotyledons, but differ from all other plants in having a distinct cell for each cotyledon.——The species are,

1. Menispermum Canadense; *Canadian Moon-seed.* Leaves peltate, cordate, roundish-angular. Root thick, woody; stems many, climbing, becoming woody, and rising to the height of twelve or fourteen feet, twisting themselves about the neighbouring plants for support. It flowers in June and

July.—Native of Virginia, Canada, and Siberia. This and the next species are easily propagated by laying down the branches in autumn. They will have made good roots by the following autumn, when they may be separated from the old plant, and transplanted where they are designed to remain. Their branches being slender and weak, require support. They thrive better near trees than in an open situation.

2. Menispermum Virginicum; *Virginian Moon-seed.* Upper leaves undivided; lower peltate, cordate-lobed. This differs from the preceding in the shape of the leaves, which are angular, and sometimes heart-shaped, but not peltate, having the footstalk at the base. The stems become woody, and rise nearly as high as those of that first sort. The flowers and berries do not differ.—Native of Virginia, &c.

3. Menispermum Japonicum; *Japonese Moon-seed.* Leaves peltate, rounded-ovate, entire. Stems herbaceous, twining, striated with several angles, smooth in all parts, simple.—Native of Japan.

4. Menispermum Carolinum; *Carolina Moon-seed.* Leaves cordate, villose underneath. This differs from the second species in the branches not becoming woody as in that; stems herbaceous.—Native of Carolina. It may be propagated by parting the roots, which spread out on one side, so that the rest of them may be cut off every other year; the best time for doing this is in the spring, a little before the plants begin to shoot; these should be planted in a warm situation, and have a light soil, for in strong land, where the wet is detained in winter, the roots are apt to rot; therefore if they are planted close to a wall exposed to the south or west, their stalks may be fastened against the wall to prevent their trailing upon the ground; and in this situation the plants will flower frequently, and by having a little shelter in severe frost, their stalks may be preserved from injury.

5. Menispermum Cocculus; *Jagged Moon-seed.* Leaves cordate, retuse, mucronate; stem jagged. The twisting stems are usually the thickness of the human arm, or thicker, irregular, and covered with a thick, lacerated, wrinkled bark; the branches terminate in strong simple tendrils; bunches of flowers a foot and half long, dividing into several lateral ones; petals six, white, reflex; fruit in bunches like grapes, but smaller, first white, then red, and finally blackish purple; usually two or three, seldom four together, on a thickish, pyramidal, wrinkled pedunele; pulp soft; stone round, like that of a cherry, but a little larger, wrinkled, and granulated, having a fissure or aperture on one side, and a white bifid kernel within. In the East Indies, where this plant is a native, the berries are used to intoxicate fish, birds, &c. in order to take them, being made into a paste for that purpose. In England, the brewers have got into a practice of putting these berries into malt liquors to increase their strength; and these, with many other equally noxious ingredients, are introduced into the London porter; which from a highly nutritious and wholesome beverage, has through such vile practices latterly degenerated into a deleterious and stupifying liquor; towards which the British farmer and the hop-merchant contribute nothing, in comparison with the numerous importers of foreign drugs. See the latter part of the article Hop, under Humulus Lupulus. Vol. 1. p. 715.—Hill observes, that the berries are of a poisonous nature, and, taken internally in considerable doses, would be attended with fatal effects: reduced to powder, and strewed on children's heads, they destroy vermin the most effectually of any thing. Made into a paste with flour and water, with the addition of a little red lead to give it a colour, and thrown in little pellets into ponds, &c. where there are fish kept, they will take it greedily, and be so intoxicated in a short time after, as to swim on the surface of the water with their bellies upwards, and suffer themselves to be taken out with the hands.

6. Menispermum Crispum; *Curled Moon-seed.* Leaves cordate; stem quadrangular, curled.—Native of Bengal.

7. Menispermum Acutum; *Sharp-leaved Moon-seed.* Leaves cordate, behind angular, acuminate; stem round, striated.—Native of Japan.

8. Menispermum Orbiculatum; *Round-leaved Moon-seed.* Leaves orbicular, villose underneath; stem round, twining, with alternate branches like the stem; flowers axillary, panicled, diœcous.—Native of the East Indies and Japan.

9. Menispermum Hirsutum; *Hairy-leaved Moon-seed.* Branch-leaves ovate: stem-leaves cordate, villose, tomentose underneath.—Native of the East Indies.

10. Menispermum Edule; *Eatable Moon-seed.* Leaves oblong, smooth; flowers six-stamined. This much resembles the preceding.—Native of Arabia.

11. Menispermum Myosotoides. Leaves linear-lanceolate, hirsute.—Native of the East Indies.

12. Menispermum Trilobum. Leaves three-lobed; stem twining.—Native of China and Japan.

13. Menispermum Fenestratum. Drupe berried, obovate, solitary, pubescent, hoary.—Native of Ceylon.

14. Menispermum Lyoni. Leaves cordate, palmate-lobate, with very long footstalks; racemes simple; flowers hexapetalous, dodecandrous; berries large, black, one-seeded; stem climbing to the height of twenty feet.—Grows in Kentucky and Tennessee, and flowers in June and July.

Mentha; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, upright, five-toothed, equal, permanent. *Corolla:* one-petalled; petals upright, tubular, a little longer than the calix; border four-parted, almost equal; the upper segment wider, emarginate. *Stamina:* filamenta four, awl-shaped, upright, distant, the two nearest longer; antheræ roundish. *Pistil:* germen four-cleft; style filiform, upright, longer than the corolla; stigma bifid, spreading. *Pericarp:* none; calix upright, with the seeds in the bottom. *Seeds:* four, small. Essential Character. *Corolla:* almost equal, four-cleft, the broader segments emarginate. *Stamina:* upright, distant.—All the plants of this genus are easily propagated by parting their roots in spring, or by planting cuttings during any of the summer months, but they should have a moist soil; and after the cuttings are planted, if the season should prove dry, they must be often watered until they have taken root; after which they will require no farther care but to keep them clear from weeds: they should be planted in beds about four feet wide, allowing a path about two feet broad between the beds, to water, weed, and cut the plants. The distance they should be set is four or five inches or more, because they spread very much at their roots; for which reason, the beds should not stand longer than three years before you plant them again, for by that time the roots will be matted so closely as to rot and decay each other, if permitted to stand longer. Some persons are very partial to mint-salad in winter and spring; in order to obtain which, they take up the roots before Christmas, and plant them upon a moderate hot-bed, pretty close, covering them with fine earth about an inch thick, and cover the beds either with mats or frames of glass. In these beds the Mint will come up in a month's time, and will soon after be fit to cut. When the herb is wanted for medicinal use, it should be cut in a very dry season, just when it is in flower; for if it stand longer, it will not be so well tasted; and if it be cut when it is wet, it will change black, and be little worth: this should

be hung up to dry in a shady place, where it may remain until it be used. If the soil in which they are planted be good, it will afford three crops every year: but after July, Mint seldom proves good, therefore the shoots produced after that time should be permitted to remain till Michaelmas, when they must be cut down close; and after having cleared the bed from weeds, you should spread a little fine rich earth all over them, which will greatly forward them against the next spring.——The species are,

1. Mentha Auricularia; *Ear Mint.* Spikes cylindrical; leaves oblong, acute, serrate, hairy, subsessile; stem strigose; stamina longer than the corolla. This herb is celebrated as a powerful remedy for deafness.—Native of the East Indies.

2. Mentha Niliaca; *Egyptian Mint.* Tomentose-hoary: spikes oblong; leaves ovate-lanceolate, serrate, sessile; stems villose, branched, weak, a foot high.—Native of Egypt.

3. Mentha Glabrata; *Smooth-spiked Mint.* Flowers racemed, verticillate; leaves petioled, ovate-lanceolate, serrate, smooth; peduncle terminating.—Native of Egypt.

4. Mentha Stellata; *Stellated Cluster-spiked Mint.* Spikes heaped, terminating; leaves stellate, serrate; stem herbaceous, upright, four-grooved, one foot high. This is the *rau ngu hoang* of the Cochin-chinese.—Native of Cochin-china.

5. Mentha Sylvestris; *Horse Mint.* Spikes hairy, slightly interrupted; leaves oblong, serrate, tomentose, sessile; stamina longer than the corolla. Stem upright, four-grooved, branched at top, smooth at bottom; calix hardly a line long, hoary; corolla twice as long, pale purple; filamenta twice or thrice as long as the corolla. It varies with filamenta equal only to the corolla.—Native of many parts of Europe, Denmark, Germany, Switzerland, France, and England, in hedges, ditches, and watery places. It is common in Lincolnshire, Cambridgeshire, Essex, Suffolk, and Kent.

6. Mentha Viridis; *Spear Mint.* Spikes oblong; leaves lanceolate, naked, serrate, sessile; stamina longer than the corolla. This is very nearly allied to the preceding, but is smaller and smoother; the corolla is purplish red.—Native of Germany, Switzerland, France, and England, in watery places, and on the banks of rivers, as on the Thames, and near Exmouth in Devonshire. This species is not so hot to the taste as Peppermint, and, having a more agreeable flavour than most of the others, is generally preferred for culinary and medical purposes. The leaves or tops are used in spring salads, and eaten dried as sauce with lamb, and in soups. The preparations of Spearmint are more pleasant than those of Peppermint, but perhaps less efficacious. This herb, and indeed all the species, contains much essential oil, but of a less agreeable odour than that of Lavender or Marjoram. It is less employed as a cephalic; but it acts very powerfully on parts to which it is immediately applied, and therefore considerably on the stomach; and as it operates especially as an antispasmodic, and therefore relieves pains and colics arising from spasm, it will also put a stop to vomiting, arising from the same cause; but if it arise from inflammation in the stomach itself, or in other parts of the body, it aggravates the disease. The infusion of Mint in warm water agrees better with the stomach than the distilled water. The officinal preparations are, an essential oil; a conserve, very grateful; and the distilled waters, both simple and spirituous, which are generally thought pleasant. Lewis observes, that Mint is said to prevent the coagulation of milk; and hence it has been recommended to be used with milk diets, and even in cataplasms and fomentations for resolving coagulated milk in the breasts: upon experiment, the curd of milk, digested in a strong infusion of Mint, could not be perceived to be any otherwise affected than by common water; but milk in which Mint leaves were set to macerate, did not coagulate near so soon as an equal quantity of the same milk kept by itself. Dried Mint, digested in rectified spirits of wine, gives out a tincture, which appears by day-light of a fine dark green, but by candle-light of a bright red colour. The fact is, that a small quantity of this tincture is green, either by day-light or candle-light, but a large quantity seems impervious to common day-light; however, when held between the eye and a candle, or between the eye and the sun, it appears red: so that, if put into a flat bottle, it appears green; but when viewed edgewise, red. The distilled water, or infusion, is much used in crudities and weaknesses of the stomach, heaving or retchings, hiccup, windiness, and burning heat. It is likewise good in griping pains of the stomach and bowels, and in giddiness and swimmings of the head. Applied externally, it takes away hardness of the breasts, and cures the head-ach. A stong decoction is an excellent wash for eruptions on the skin, chaps, and sore heads.

7. Mentha Rotundifolia; *Round-leaved Mint.* Spikes long; leaves roundish, rugged, shagged, sharply crenate, sessile; bractes lanceolate; stamina longer than the corolla. Stems from two to three feet high, erect, hairy, or shaggy, the hairs pointing more or less downwards.—Native of several parts of Europe. It is rather rare in England; but is found at Shingham in Norfolk; near Faulkburn Hall in Essex; in Cambridgeshire; near Ross in Herefordshire; and in Hornsey and Harefield church-yards, Middlesex.

8. Mentha Crispa; *Curled Mint.* Flowers in heads; leaves cordate, toothed, waved, sessile; stamina equalling the corolla. Stems hairy, about the same height with common Spearmint.—Native of Siberia, China, and Cochin-china.

9. Mentha Hirsuta; *Round-headed Mint,* or *Hairy Water Mint.* Flowers in dense, compound, terminating heads; leaves ovate, serrate, subsessile, pubescent; stamina longer than the corolla. Roots long, branched, creeping under water; stem branched, very generally purplish, rough, with deflex hairs scattered all over it; flowers lilac-coloured. The degree of hairiness throughout the whole plant varies very much. When out of the water, it grows much smaller, more purple, and with a simple head of flowers.—It flowers in August, and is very common in clear ditches, rivulets, and other watery places, growing sometimes among large grasses and reeds, sometimes by itself.

10. Mentha Aquatica; *Water Mint.* Flowers in heads; leaves ovate, serrate, petioled; stamina longer than the corolla. Corolla pale red. This is not a rough-haired plant.

11. Mentha Piperita; *Pepper Mint.* Flowers in heads; leaves ovate, petioled; stamina shorter than the corolla. This species has smooth purple stalks. The stem and leaves are beset with many very minute glands, containing the essential oil, which rises plentifully in distillation. It has the most penetrating smell of any of its genus, and also the strongest taste, pungent and glowing like pepper, sinking as it were into the tongue, and followed by a sensation of coldness. Its stomachic, antispasmodic, and carminative qualities, render it useful in flatulent colics, hysterical affections, retchings, and other dyspeptic symptoms, acting as a cordial, and often producing immediate relief. The officinal preparations are an essential oil, a simple water, and a spirit. The essence of Peppermint is an elegant medicine, and seems to be the rectified oil dissolved in spirits of wine. Meyrick observes, it is a valuable medicine in flatulent colics, hysteric depressions, and other complaints of a similar nature; exerting its salutary effects as soon as it arrives in the stomach, and diffusing a glowing warmth throughout the whole body, and yet without heating the body near so much as might be

expected from the great warmth and pungency of its taste.—Native of watery places in various parts of England; but seems not to have been found wild any where else.

12. Mentha Sativa; *Marsh Whorled Mint.* Flowers in whorls; leaves ovate, sharpish, serrate; stamina longer than the corolla. Stem upright; leaves on winged footstalks, ovate, serrate, pubescent; peduncles and calix hairy; root throwing out long, creeping, horizontal shoots, and one erect hairy stem, furnished all the way up to the flowering part with shortish, axillary, leafy branches. This is suspected to be a variety of the ninth species, (the Round-headed Mint.) It flowers in August and September.

13. Mentha Gentilis; *Bushy Red Mint.* Flowers in whorls; leaves ovate-lanceolate, acute, nearly sessile, scarcely hairy; peduncles perfectly smooth; teeth of the calix hairy. Stems several, erect, growing in tufts, about eighteen inches high, with harsh and somewhat hairy angles; corolla pale purple. There is a variety of this species, having the same delightful scent as Basil.—Native of several parts of Europe, in watery places, and by the sides of rivulets. Found near Walthamstow, and on a small common at Saham in Norfolk.

14. Mentha Arvensis; *Corn Mint.* Flowers in whorls; leaves ovate, acute, serrate; stamina equalling the corolla; stem much branched, diffuse. The whole plant is covered with soft white hairs pointing downwards. It prevents the coagulation of milk; and when cows have eaten it, as they will do largely at the end of summer when pastures are bare, their milk can hardly be made to yield cheese; a circumstance which sometimes puzzles the dairy maids.—Native of many parts of Europe, in watery places and moist corn-fields.

15. Mentha Austriaca; *Austrian Mint.* Flowers in whorls, all the segments of the corolla blunt; leaves subovate, villose; stamina shorter than the corolla. This very much resembles the preceding, but differs from it in being of a lower stature, in its smell, the shortness of the stamina, its greater hoariness, &c. Stems half a foot high and more, upright, almost simple. It flowers in July and August.—Native of Austria, in the islands of the Danube; and probably of Piedmont.

16. Mentha Canadensis; *Canadian Mint.* Flowers in whorls; leaves lanceolate-serrate, petioled, hairy; stamina equalling the corolla.—Native of Canada.

17. Mentha Pulegium; *Pennyroyal.* Flowers in whorls; leaves ovate, blunt, subcrenate; stems roundish, creeping; stamina longer than the corolla. Root fibrous, perennial. This is much smaller than any of the preceding, and is known by its prostrate stems, and numerous dense whorls of purplish flowers, sometimes white, without bractes.—Native of watery places in various parts of Europe. There is a variety called Spanish Pennyroyal, with erect stems and larger whorls of flowers, and longer and narrower leaves, which has almost superseded our wild one in the markets, because the erect stems are more easily tied in bunches, and it comes earlier to flower, and has a brighter appearance. Pennyroyal has a warm pungent flavour resembling Mint, but more acrid and less agreeable. Its active principle is an essential oil, of a more volatile nature than that of Mint, coming over hastily with water at the beginning of the distillation, and rising also in great part with highly rectified spirit; in taste very pungent, and of a strong smell; when newly drawn, of a yellowish colour with a cast of green, turning brownish by age. It certainly possesses the general properties of Mint, but is supposed to be of less efficacy as a stomachic, but more useful as a carminative and emmenagogue, and more commonly employed in hysterical affections. We are told by Boyle and others, that it has been successfully used in the hooping-cough; but the chief purpose to which it has been long administered is promoting the uterine evacuation. For this purpose Haller recommends an infusion of the herb with steel in white wine. In the opinion of Dr. Cullen, however, Mint is more effectual than Pennyroyal, and nothing, he says, but the neglect of established principles, could have made physicians regard this as a peculiar medicine distinct from the Mints; and accordingly this plant is less frequently used now than formerly. Lewis says, it is not so proper as Mint to be administered in common sicknesses or weaknesses of the stomach, but is much more efficacious in windy complaints, hysterics, and disorders of the breast. Meyrick adds, the distilled water, a strong infusion, or the juice fresh expressed from the plant, is excellent for obstructions of the menses. A conserve of the young tops acts as a diuretic, has been many times very serviceable in the gravel, and is also useful for the jaundice, and all other complaints arising from obstructions of the viscera.—This, and the next species, both propagate very fast by their creeping stems, which may be cut off and planted in fresh beds, allowing them at least a foot distance every way: or, the young shoots planted in the spring will take root like Mint. The best time for this work is in September, that the plants may be rooted before winter.

18. Mentha Cervina; *Hyssop-leaved Mint.* Flowers in whorls; bractes palmate; leaves linear; stamina longer than the corolla. Stems erect, nearly two feet high, sending out side-branches all their length; whorls large, dense, many-flowered. There is a variety with white flowers, which grows taller than the common one with purple flowers. The scent is not quite so strong as that of Pennyroyal, but it is by some preferred to it for medicinal uses; it is called Hart's Pennyroyal.—Native of the south of France, and Italy.

19. Mentha Borealis. Leaves petiolate, oval-lanceolate, very acute; flowers verticillate; stamina standing out: flowers pale purple, appearing in July and August.—Grows on the banks of rivers and springs, from Canada to Pennsylvania.

20. Mentha Tenuis. Leaves lanceolate-ovate, subsessile; spikes slender, interrupted with very small whorls; stamina not standing out; flowers white, appearing from June to August.—Native of wet places near springs, from Pennsylvania to Georgia.

Mentzelia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, spreading, superior, deciduous; leaflets lanceolate, concave, acuminate. *Corolla:* petals five, obovate, acuminate, a little longer than the calix, spreading. *Stamina:* filamenta many, (thirty,) the length of the calix, erect, bristle-shaped, the ten outer membranaceous at top; antheræ roundish. *Pistil:* germen cylindric, very long, inferior; style filiform, the length of the stamina; stigma simple, blunt. *Pericarp:* capsule cylindric, long, one-celled, three-valved at top. *Seeds:* about six, oblong, angular. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Capsule:* inferior, cylindric, many-seeded.——The species are,

1. Mentzelia Aspera; stem branched; flowers axillary; petals notched, obtuse. Brown says this plant is very common in all the dry savannas about Kingston, and that it seems to be an annual, and seldom rises above three or four feet in height. He describes the fruit as a succulent cylindric capsule, well furnished with short, rough, uncinated bristles, like the rest of the plant, and containing only three or four rugged seeds, compressed on one side, and disposed at some distance from each other in the pulp.—As this, and the next, are annual plants, which perish soon after the seeds are ripe, the seeds must be sown on a hot-bed early in the spring, that the plants may be brought forward early in the season,

otherwise they will not produce ripe seeds in this country. When the plants are come up about an inch high, they should be each transplanted into a separate halfpenny pot filled with light rich earth, and plunged into a hot-bed of tanner's bark, being careful to shade them from the sun until they have taken new root; after which time they must be constantly watered every other day in warm weather, and should have fresh air every day admitted to them, in proportion to the warmth of the season, and the heat of the bed in which they are plunged. In about six weeks or two months after transplanting, if the plants have made a good progress, they will have filled the pots with their roots, and should be shifted into larger pots filled with light rich earth, and then plunged into the bark-bed in the stove, that they may have room to grow in height, observing as before to water them duly, as also to admit fresh air to them every day in warm weather. With this management they will grow three feet high, and produce ripe seeds at the end of August or beginning of September.

2. Mentzelia Hispida. Stem forked; flowers solitary, at the forks of the stem; petals entire, acutely pointed.—Native of Mexico.

Menyanthes; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, erect, permanent. *Corolla:* one-petalled, funnel-form; tube cylindric, funnel-form, short; border five-cleft beyond the middle; clefts reflex-spreading, blunt, conspicuously shaggy. *Stamina:* filamenta five, awl-shaped, short; antheræ acute, bifid at the base, erect. *Pistil:* germen conical; style cylindric, almost the length of the corolla; stigma bifid, compressed. *Pericarp:* capsule ovate, surrounded by the calix, one-celled. *Seeds:* many, ovate, small. *Observe.* The first species was distinguished by the petals being ciliate, not shaggy. Essential Character. *Corolla:* shaggy. *Stigma:* bifid. *Capsule:* one-celled.——The species are,

1. Menyanthes Nymphoides; *Fringed Buckbean*, or *Small Yellow Water Lily.* Leaves cordate, quite entire; corollas ciliate. Root perennial, long, and stringy, as are also the stems; these are smooth, round, and jointed. It flowers from June to August.—Native of Denmark, Holland, Germany, Piedmont, Siberia, and England, in large ditches and slow streams. It is found in little recesses upon the banks of the Thames, as near Walton bridge, Botley bridge, Godstow bridge, and Hinksey ferry, in Oxfordshire; and in the river Cam, at Streathem ferry; and very commonly in the fens of Ely.

2. Menyanthes Indica; *Indian Buckbean.* Leaves cordate, subcrenate; petioles floriferous; corollas hairy within.—Native of both Indies. Sir William Jones, in his Select Indian Plants, describes another species, probably only a variety, with ten stamina, five of which are fertile. He calls it *Cumada*, or Delight of the Water, which seems to be a general name for beautiful aquatic flowers.

3. Menyanthes Ovata; *Cape Buckbean.* Leaves ovate, petioled; stem panicled. This has the appearance of Alisma.—Native of the Cape.

4. Menyanthes Trifoliata; *Common Buckbean*, or *Marsh Trefoil.* Leaves ternate; corolla extremely hairy on the upper side. Root perennial, creeping, long, jointed, and fibrous; stem procumbent, various in length according to situation, covered by the sheaths of the leaves, which are on round striated petioles; corolla outwardly rose-coloured, inwardly white. An infusion of the leaves is extremely bitter, and of late years has been in common use as an alterative and aperient in impurities of the humours, and some hydropic and rheumatic complaints. A drachm in powder purges and vomits. It is sometimes given to destroy worms. As an active and eccophrotic bitter, it seems not ill adapted to supply the want of bile in the *primæ viæ;* and thus may be of use in protracted jaundice, and other biliary obstructions. Cullen mentions several instances of its good effects in some cutaneous diseases of the herpetic and seemingly cancerous kind. It may be necessary for delicate stomachs to join some grateful aromatic with the infusion. In a scarcity of hops, this plant is used in the north of Europe to give a bitter to beer; two ounces will supply the place of a pound of hops. The powdered roots are sometimes used in Lapland instead of bread, but they are unpalatable. Some say that sheep will eat it, and that it cures them of the rot. Meyrick observes, that it promotes the fluid secretions of the body, loosens the belly, and is good in the jaundice, dropsy, scurvy, rheumatism, ague, and scrofulous disorders. For the dropsy, the best method is to bruise the plant, and extract the juice with a little white wine. In scorbutic complaints, a strong infusion should be drank for a considerable time, to the amount of three half pints or a quart a day. For the ague, it must be dried and finely powdered, in which state half a drachm is a full dose, and, if properly repeated, will frequently effect a cure when most other means prove ineffectual. Boerhaave says, the juice of the leaves mingled with whey is serviceable in the gout.—This was formerly called *Marsh Trefoil*, and *Marsh Claver* or *Clover.* The Germans call it *Bocsbohne;* the Danes, *Bukkeblade.* It flowers from May to July, and is found in wet boggy meadows, in ditches, and upon the sides of ponds and lakes: as in Battersea meadows; about the island of St. Helena; near Rotherhithe; about Staines; on Bromley Common; between Farnborough and Caston Mark; at Cæsar's Camp near Bromley; upon Hayes Common, Hampstead Heath, Harefield Moor, and at several places in Cambridgeshire. This plant is frequently rooted out by the simplers.—This plant has not been cultivated in gardens: it deserves cultivation, however; and to such as wish to have it flower in perfection, Mr. Curtis recommends to collect the roots in spring or autumn, to put them in a large pot having a hole in the bottom, and filled with bog-earth, and to immerse the pot about two-thirds of its depth in water.

5. Menyanthes Hydrophyllum; *Water-leaf Buckbean.* Leaves cordate, quite entire; flowers axillary, heaped, nectariferous.—Native of Cochin-china.

Mercurialis; a genus of the class Diœcia, order Enneandria.—Generic Character. *Male. Calix:* perianth three-parted; parts ovate-lanceolate, concave, spreading. *Corolla:* none, except the calix. *Stamina:* filamenta nine or twelve, capillary, straight, the length of the calix; antheræ globular, twin. *Female. Calix:* perianth as in the male. *Corolla:* none; nectaries two, awl-shaped points, one on each side of the germen, impressed on the groove of the germen. *Pistil:* germen roundish, compressed, scored on each side, hispid; styles two, reflex, horned, hispid; stigmas acute, reflex. *Pericarp:* capsule roundish, shaped like the scrotum, twin, two-celled. *Seeds:* solitary, roundish. Essential Character. *Male. Calix:* three-parted. *Corolla:* none. *Stamina:* nine or twelve. *Antheræ:* globular, twin. *Female. Calix:* three-parted. *Corolla:* none. *Styles:* two. *Capsules:* dicoccous, two-celled, one-seeded.——The species are,

1. Mercurialis Perennis; *Dog's Mercury.* Stem quite simple; leaves rugged. Root perennial, creeping, white, very fibrous. The male and female plants are rarely found intermixed, each sort usually growing in large patches; whence it is probable that this plant, which increases by the root, rarely produces perfect seeds. In the third edition of *Ray's Synopsis* there is a very circumstantial relation from Sir Hans Sloane,

of a man with his wife and three children experiencing highly deleterious effects from eating this plant fried with bacon; but as Mr. Miller asserts the same thing without citing any instance, it would be well to ascertain the fact, for this is a common plant, very much resembling the third species, which is used for a pot-herb, and sometimes as an emollient. Linneus says it is injurious to sheep; but with us, no quadruped appears to eat it. In drying, it turns blue; and steeped in water, yields a fine deep blue colour, which is said to be unfortunately destructible both by acids and alkalies, and not recoverable by any means yet discovered.—It is common in woods and hedges, flowering from the end of March to the middle of May. It is easily propagated by the roots, and requires a warm situation and a dry rubbishy soil. It is often killed by hard frosts.

2. Mercurialis Ambigua; *Doubtful Mercury.* Stem brachiate; leaves smoothish; flowers in whorls, female and male. Root fibrous; annual.—Native of Spain, on the walls of Cadiz and Gibraltar.

3. Mercurialis Annua; *Annual* or *French Mercury.* Stem brachiate; leaves smooth; flowers in spikes. Root annual, fibrous, white. This may be distinguished from the first species by its annual root, branched stem, more numerous flowers, its want of nectaries or barren stamina, and its smaller hairy seed-vessels. It also flowers late in the summer, whereas Dog's Mercury flowers only in the spring. This plant is mucilaginous, and was formerly much employed as an emollient. Tournefort informs us, that the French made a syrup of it, two ounces of which was given as a purge; and that they used it in clysters and pessaries, mixing one part of honey with one and a half of juice. The seeds taste like those of hemp. It is now disregarded in England.—Native of many parts of Europe. Found in Great Britain, upon waste places and dunghills about towns and villages, but seldom at a distance from inhabited places. It scatters seed, and increases so much as to be a common weed in gardens.

4. Mercurialis Tomentosa; *Woolly Mercury.* Stems suffruticose; leaves tomentose.—Native of the south of France, Spain, and Italy. If the seeds be permitted to scatter, they will come up in the following spring; if they are sown, it should be in autumn. It requires a dry rubbishy soil.

5. Mercurialis Afra; *Cape Mercury.* Stem prostrate, herbaceous; leaves ovate, subtomentose; flowers androgynous.—Found at the Cape.

6. Mercurialis Indica. Stem shrubby, branched; leaves lanceolate, even; flowers three-styled. The fresh leaves boiled in soup purge gently.—Native of Cochin-china.

Mercury, English. See *Chenopodium.*

Mesembryanthemum; a genus of the class Icosandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, superior, acute, spreading, permanent. *Corolla:* one-petalled; petals lanceolate-linear, very numerous, in several rows, a little longer than the calix, slightly united at the claws into one. *Stamina:* filamenta numerous, capillary, the length of the calix; antheræ incumbent. *Pistil:* germen inferior, with five blunt angles; styles four to ten, commonly five, awl-shaped, upright, and then bent back; stigma simple. *Pericarp:* capsule fleshy, roundish, the navel marked with rays, the cells corresponding with the styles in number. *Seeds:* very many, roundish. Essential Character: *Calix:* five-cleft. *Petals:* numerous, linear. *Capsule:* fleshy, inferior, many-seeded. This is a vast genus of succulent plants, formerly known by the name of *Ficoides*, from its affinity to the Indian Fig. The new Edition of Hortus Kewensis enumerates 175 species. They are nearly all the production of the arid sands of the Cape: Some are annuals, though most are perennials. Some are stemless. Some are lax, with a pendulous stem or branches; and the rest are shrubby, with a woody hard stem. The greater part have opposite leaves, but some have them alternate. Most of them have five styles, some four, and others ten; and the number varies in several of the species.——Among the species are the following:

* *With white Corollas.*

1. Mesembryanthemum Nodiflorum; *Egyptian Fig Marigold.* Leaves alternate, roundish, blunt, ciliate at the base. Stems decumbent and diffused; the whole plant papulose.—Native of Egypt, where they cut up the plants, and burn them for pot-ash; it is esteemed the best sort for making hard soap, and the finer glass. It also grows wild in Italy about Naples, on high sea-banks exposed to the spray. In the stove the stalks grow long and slender, and are not productive of flowers. Raised in a hot-bed, and afterwards exposed to the open air, it flowers freely.—This, with the other *annuals* of this genus, is propagated by seeds, sown upon a hot-bed early in the spring. When the plants come up, plant them on a fresh hot-bed to bring them forward. After they have taken root in the hot-bed, they should have very little water. When they are large enough to transplant again, plant each in a small pot filled with light fresh earth, but not rich, and plunge them into a hot-bed of tan, shading them in the heat of the day, until they have taken new root, and then giving them plenty of fresh air. At the end of June, some of the plants may be inured to the open air, and afterwards may be turned out of the pots, and planted in a warm border, where they will thrive and spread, but will not be very productive of flowers. Some therefore must be continued in the pots, and removed to the shelves of the stove, that they may flower plentifully, and produce good seeds.

2. Mesembryanthemum Ciliatum; *Ciliated Fig Marigold.* Leaves opposite, connate, half round; stipules membranaceous, reflex, jagged, ciliary. This is a beautiful little shrub, with a perennial fibrous root, and slender, but firm, nearly upright, straight branches; thickly adorned with green, dotted, very small triquetrous leaves.—Native of the Cape.

3. Mesembryanthemum Caducum; *Small-flowered Fig Marigold.* Leaves filiform, half round, distinct; teats ovate, lateral; flowers sessile, terminating; flowers surrounded by a pair of leaves.—Native of the Cape.

4. Mesembryanthemum Crystallinum; *Diamond Fig Marigold,* or *Ice Plant.* Leaves alternate, ovate, papulose; flowers sessile; calices broad ovate, acute, retuse. This plant is an annual, and is distinguished by its leaves and stalks, being closely covered with pellucid pimples full of moisture, which when the sun shines on them reflect the light, and appear like small bubbles of ice; whence it has been called by some the *Ice Plant,* and by others the *Diamond Plant,* or *Diamond Ficoides.* It flowers in July and August.—Native of Greece, near Athens. For its propagation and culture, see the first species.

5. Mesembryanthemum Humifusum; *Narrow-leaved Icy Fig Marigold.* Leaves embracing, spatulate, keeled; teats conical, rugged; petals very minute.—This shrub is a native of the Cape. This, like all the *perennial* and *shrubby* sorts, may be increased very readily in a stove, either from seeds or cuttings not covered by bell-glasses. Sow the seed as soon as procured, unless it be in the depth of winter, in a poor, light, sandy soil, kept damp, but not wet: its germination will be much assisted by the bark-bed. They all remain a long time in the seed-leaf. When the young plants appear, they should have rather more water and air, until they have four or five leaves, when they may be transplanted into the smallest pots, kept in the same gentle

hot-bed until they have got fresh roots, when they should be gradually hardened to the open air, if it be summer, or placed near the old plants in the dry-stove in winter. When they have filled the small pots with their roots, they should be supplied with larger ones.—If raised from cuttings, the shoots need not be large, and the youngest are the best; they should be divested of a few of the old leaves, and, if very succulent, laid in a dry shady place, from one to twenty-four hours, to heal their wounds; after which, plant them in a light, sandy, unmanured soil, which will not bind, with the earth pressed close; water them very sparingly, and shade them from the sun until they have stricken root, but without covering them with a hand-glass. Their striking will be greatly accelerated by plunging them into a gentle hot-bed, though most of them will succeed very well without that assistance if kept in the house; and many will do well during the summer even in open borders, proivded they are gently watered when dry. May is the most favourable season for striking them; but they may be struck at almost all times of the year, in a very moderate stove. Some strike in ten days, some take a fortnight, and others require a month or six weeks.

6. Mesembryanthemum Copticum; *Coptic Fig Marigold.* Leaves half round, papulose, distinct; flowers sessile, axillary; calices five-cleft.—Annual; and a native of Egypt. See the first species.

7. Mesembryanthemum Apetalum; *Dwarf Spreading Fig Marigold.* Leaves embracing, distinct, linear, flat above, longer than the internodes, papulose; papulæ oblong; flowers peduncled; calices five-cleft. Annual. Stem herbaceous, round, red, and, like the whole plant, covered with obsolete, papulose, shining dots. It flowers in July and August.—Native of the Cape. See the first species.

8. Mesembryanthemum Geniculiflorum; *Jointed Fig Marigold.* Leaves half round, papulose, distinct; flowers sessile, axillary; calices four-cleft. Herbaceous while young, becoming shrubby by age; flowers small, making a poor appearance.—Native of the Cape. This plant strikes readily from young shoots, but with difficulty from old ones, and is apt to lose its leaves, and then looks like a different plant. See the fifth species.

9. Mesembryanthemum Noctiflorum: *Night-flowering Fig Marigold.* Leaves semi-cylindric, undotted, distinct; flowers peduncled; calices four-cleft. The trunk becomes about the thickness of a little finger, is smooth and even, covered with a bay-coloured bark, and has frequent joints where branches have fallen. The flowers are closed during the day, open in the evening, and continue open during the night, when they smell very sweet. There is a variety with larger flowers, outside of a pale yellow colour.—Native of the Cape. See the fifth species.

10. Mesembryanthemum Splendens; *Shining Fig Marigold.* Leaves roundish, undotted, recurved, distinct, heaped; calices finger-shaped, terminating. Stems woody, a foot and more high, with many short branches, and clustered leaves; flowers solitary, at the end of the branchlets, large, whitish or very pale yellow; appearing in July and August. They open before and after noon when the sun shines, opening and shutting several times, and finally closing about the fruit.—Native of the Cape. See the fifth species.

11. Mesembryanthemum Umbellatum; *Umbelled Fig Marigold.* Leaves awl-shaped, rugged, dotted, connate, with a patulous tip; stem upright; corymb trichotomous. Stems woody, forming a regularly branched handsome shrub, standing without support, with a stout stem, from two to three feet high, and even more; flowers terminating, white, opening when the sun shines, from seven or eight in the morning to two or three in the afternoon, and smelling like those of May or White-thorn. They appear from June to September.—Native of the Cape. See the fifth species.

12. Mesembryanthemum Expansum; *Houseleek-leaved Fig Marigold.* Leaves flattish, lanceolate, undotted, spreading, distinct, opposite and alternate, remote. Stems and branches irregular and distorted. The dots upon the leaves shine like silver in the sun.—Native of the Cape. It flowers in July and August. See the fifth species.

13. Mesembryanthemum Testiculare; *Short White-leaved Fig Marigold.* Leaves four, decussated, flat above. Stemless, very white and short.—Native of the Cape.

14. Mesembryanthemum Criniflorum; *Hairy-flowered Fig Marigold.* Leaves ovate; scapes one-flowered. This plant is the size of a common daisy.—Native of the Cape.

15. Mesembryanthemum Tripolium; *Plane-leaved Fig Marigold.* Leaves alternate, lanceolate, flat, undotted; stems loose, simple; calices five-cornered. Root biennial; stems prostrate, smooth, finally terminating in flowers; leaves many, almost as long as the stems, succulent.—This, and the other *succulent* sorts, may be propagated by cuttings taken from the plants ten days or a fortnight before they are planted that they may have time for their wounded part to heal over and dry. The lower leaves should be stripped off, that their naked stalks may be of a sufficient length for planting. As they are mostly plants of humble growth, so if their stalks be divested of their leaves an inch and half, it will be sufficient. The cuttings require to be covered with glasses, to keep off the wet; they must also have less water than the other, but in other particulars require the same treatment. They must not have much water in summer, and still less in winter. If these succulent sorts are placed in an open airy glass-case in winter, where they may have free air admitted plentifully to them in mild weather, and be at the same time screened from frost, they will thrive better than when more tenderly treated. They require to be shifted twice a year.

16. Mesembryanthemum Calamiforme; *Quill-leaved Fig Marigold.* Stemless: leaves roundish, ascending, undotted, connate; flowers eight-styled. Flowers solitary, on a short scape from the centre of the plant, large; petals very narrow, white, shining like silver in the sun, void of scent, opening about noon in July, August, and September.—Native of the Cape. See the preceding species.

17. Mesembryanthemum Digitatum; *Blunt-leaved Fig Marigold.* Almost stemless: leaves alternate, round, blunt; flowers axillary, sessile.—Native of the Cape. See the fifteenth species.

18. Mesembryanthemum Pallens; *Pale* or *Channel-leaved Fig Marigold.* Leaves opposite, embracing, distinct, oblong-lanceolate, acute, bluntly keeled; teats minute.—Native of the Cape. See the fifteenth species.

***With red Corollas.*

19. Mesembryanthemum Papulosum; *Angular-stalked Fig Marigold.* Leaves opposite, distinct, ovate-spatulate; teats subglobular; calices angular, five-cleft; branches angular. Root biennial; stem short, nearly the thickness of the little finger. The flowers have no scent, and are open from three to six in the afternoon. It flowers from April to October.—Native of the Cape. See the fifteenth species.

20. Mesembryanthemum Cordifolium; *Heart-leaved Fig Marigold.* Leaves opposite, petioled, cordate; calices four-cleft; stem round. Root perennial; stem rather shrubby, fleshy, upright, much branched, roundish, smooth, covered, as well as the leaves and calix, with depressed dots. Flowers solitary, pedunculed, erect; petals numerous, reddish purple, white at the base. It flowers from May to September.—Native

of the Cape. If planted in a south border, it will cover many feet of ground, and flower and perfect seeds.

21. Mesembryanthemum Limpidum; *Transparent Fig Marigold.* Leaves opposite, spatulate, blunt, rugged; teats oblong; calicine leaflets oblong, blunt, contracted in the middle. Root annual; stems round, branching, purple, half a foot long or more, procumbent, the whole covered with icy blebs like the fourth species; flowers elegant, an inch and half in diameter, void of scent. It flowers in July.—Native of the Cape. See the fifth species.

22. Mesembryanthemum Bellidiflorum; *Daisy-flowered Fig Marigold.* Stemless: leaves three-sided, linear, undotted, toothed in three rows at the tip. Flowers solitary, terminating, the form and size of a daisy, whitish with a tinge of purple, and streaked with a purple line along the middle of each petal both within and without. They open about noon, and appear from June to August.—Native of the Cape. See the fifth species.

23. Mesembryanthemum Deltoides; *Delta-leaved Fig Marigold.* Leaves deltoid, three-sided, toothed, undotted, distinct. This grows two feet or more in length, with a round stem, and opposite branches covered with thick leaves; flowers in a sort of umbel at the ends of the branches; corollas pale purple, sweet-smelling, not longer than the calix; stamina white, upright, and forming a cone; antheræ yellow. In warm weather the flowers continue open day and night. There are two varieties; the first has larger and paler flowers, rather inclining to violet, and appearing three or four weeks later. The second variety has flowers of a pale rose-purple colour, numerous: they open in a morning as soon as the sun shines strongly upon them. These varieties all agree in having triquetrous leaves shaped like the Greek *delta* Δ, of a smooth and even surface, appearing porous when held up to the light.—Native of the Cape.

24. Mesembryanthemum Barbatum; *Bearded Fig Marigold.* Leaves subovate, papulose, distinct, bearded at the tip. The least interior petals which surround the stamina are white. There are several varieties: the first has stems somewhat woody and slender. The flowers open when the sun shines from seven or eight in the morning till noon, but shut soon after noon although the sun still shines: they open several days successively, and have a scarcely perceptible Hawthorn smell. The second variety is sessile or stemless the first and second year, but afterwards acquires a low stem and resupine branches. The flowers come out later, namely, in September and October; they are somewhat smaller, a pale purple tending to pale violet, and shining. A third variety might be taken for a younger plant of the other; however, the cuttings never protrude such thick and long leaves. It flowers from June to August.—Native of the Cape. This, as well as the twenty-fifth, thirty-first, thirty-ninth, fifty-ninth, and sixtieth species, will sometimes abide several winters, on a dry artificial rock, or upon the top or at the foot of a dry wall. These plants thrive best in winter in a dry, light, airy stove or large glass-case, not overstocked with plants, especially such as cause watery vapours by casting their leaves. The flues should be gently worked in cold and damp weather, and the plants should not be placed too near each other, but ought to have as much free air as possible when the weather is dry and favourable, and should be watered only sparingly in cold weather. Those which hold water within the centre should not be watered over the tops in winter time.

25. Mesembryanthemum Hispidum; *Bristly Fig Marigold.* Leaves cylindric, papulose, distinct; stem hispid. Stems and branches from a foot and a half to two feet in length, numerous, spreading every way, slender, the lower joints swelling out into knots, an inch or more distant; leaves dark green, shining with innumerable icy globules closely heaped together. Peduncle very rugged downwards, rather to the sight than the touch; calix awnless; flower sweet-smelling, very like that in the preceding species, from which perhaps it originally sprung, losing the beard of the leaves, and having it scattered over the stem. There are several varieties: one in which the gobules are less protuberant in this than in the third hereafter mentioned, and more confluent, so that the leaves appear wrinked with them. The second variety is lower, more branched and upright, than the preceding; flowers pale purple. A third variety with flowers of the same size, but of a paler colour: this is very often in bloom; it opens its gay striated flowers in the forenoon, which being numerous, make a fine appearance when expanded, but are handsomest the first time of opening, for they lose their gayest colours long before they fade quite away. It flowers a great part of the year.—Native of the Cape. See the preceding species.

26. Mesembryanthemum Villosum; *Hairy-stalked Fig Marigold.* Leaves pubescent, connate, undotted; stem hairy; branches in pairs. The flowers are solitary, terminating, rarely seen, opening only in the forenoon to a very warm sun. —Native of the Cape. See the fifth species.

27. Mesembryanthemum Bracteatum; *Bracteated Fig Marigold.* Leaves somewhat sabre-shaped, dotted, recurved at the tip; bractes embracing, broad-ovate, keeled. Stem not very shrubby nor very thick, from a foot and half to two feet high; branches woody. The flowers smell like those of the Hawthorn, remaining from July to October in succession, and being open both day and night.—Native of the Cape. See the fifth species.

28. Mesembryanthemum Scabrum; *Rugged Fig Marigold.* Leaves awl-shaped, distinct, muricate, dotted all round underneath; calices awnless. Stems woody, at bottom bay, the branches yellowish brown, procumbent; flowers solitary, (two or three,) violet purple and shining, but becoming paler, opening two or three times, before and after noon.—Native of the Cape. See the fifth species.

29. Mesembryanthemum Reptans; *Creeping Fig Marigold.* Leaves three-sided, acute, rugged; stem creeping. In the open air it will extend the branches above a foot and half every way, and they will be firmly fixed to the ground by strong fibres at every joint.—Native of the Cape of Good Hope. See the fifteenth species.

30. Mesembryanthemum Emarginatum; *Notch-flowered Fig Marigold.* Leaves awl-shaped, heaped, somewhat rugged; calices spiny; petals emarginate. Shrubby but procumbent; even when tied up, its irregular twisted branches will hang down. Flowers several, middle-sized, with scarcely any odour, on slender long peduncles; petals very many, lying one over the other, of a most vivid violet colour; but the flowers only expand at noon when the sun is hot.—Native of the Cape. See the fifteenth species.

31. Mesembryanthemum Uncinatum; *Hook-leaved Fig Marigold.* Joints of the stem terminated by connate, acuminate, dotted leaves, toothed underneath. Stems slender, round. There are several varieties.—Native of the Cape. See the twenty-fourth species.

32. Mesembryanthemum Spinosum; *Thorny Fig Marigold.* Leaves from round three-sided, dotted, distinct; thorns branched. Flowers small, pale violet purple, on slender, leafless, green peduncles. It is an upright thorny shrub, from two to three feet high, much branched.—Native of the Cape See the fifth species.

33. Mesembryanthemum Tuberosum; *Tuberous-rooted Fig Marigold.* Leaves awl-shaped, papulose, distinct, patulous at the tip; root headed. This forms a low, much branched, and spreading shrub; and when old has a very large tuberous root, sometimes as big as a man's head, partly protruded above the surface. It flowers about noon.—Native of the Cape. See the fifth species.

34. Mesembryanthemum Tenuifolium; *Slender-leaved Fig Marigold.* Leaves subfiliform, smooth, distinct, longer than the internodes; stems procumbent. Stems woody, slender, round, with a yellowish bark; flowers at the ends of the branches, solitary, on long slender peduncles; they are large, especially on young plants, pale scarlet, shining, and appearing powdered with gold dust in full sun-shine: they are abundant, and open several days successively about noon, especially in June.—Native of the Cape. See the fifth species.

35. Mesembryanthemum Stipulaceum; *Upright Shrubby Fig Marigold.* Leaves subtriquetrous, compressed, curved inwards, dotted, distinct, heaped, margined at the base. Plant upright, woody, firm, growing to a larger size than most of the species; flowers terminating in a sort of corymb, large, showy, and purple.—Native of the Cape. See the fifth species.

36. Mesembryanthemum Læve; *Upright White-wooded Fig Marigold.* Leaves cylindric, blunt, embracing, even; calices five-cleft; segments oblong, blunt.—Native of the Cape. See the fifth species.

37. Mesembryanthemum Deflexum; *Bending Fig Marigold.* Leaves three-sided, acute, glaucous; dots obsolete, somewhat rugged; interior calicine segments membranaceous. This is a very low, small, spreading, or trailing shrub. It flowers from July to October.—Native of the Cape. See the fifth species.

38. Mesembryanthemum Australe; *New Zealand Fig Marigold.* Leaves subtriquetrous, small-dotted, connate, bluntish; stem round, creeping; peduncles bluntly ancipital, solitary.—Native of New Zealand, flowering in July and August.

39. Mesembryanthemum Crassifolium; *Thick-leaved Fig Marigold.* Leaves semicylindric, undotted, connate, three-sided at top. This is a handsome plant, with creeping stems a span long, thickly furnished with leaves; and the branches, which sometimes hang a full yard from the pot, are naturally prostrate and reptant, angular and slender.—Native of the Cape. See the fifteenth species.

40. Mesembryanthemum Falcatum; *Sickle-leaved Fig Marigold.* Leaves somewhat sabre-shaped, curved inwards, dotted, distinct; branches round. It is a very low, bushy, divaricating, almost decumbent shrub, rarely above six or eight inches high; leaves very minute and much crowded, glaucous, with smooth pellucid dots; flowers purple, large, solitary, opening in the morning. It flowers abundantly great part of the summer.—Native of the Cape. See the fifth species.

41. Mesembryanthemum Glomeratum; *Clustered Fig Marigold.* Leaves roundish, compressed, dotted, distinct; stem panicled, many-flowered. This is a small, very bushy, and rather glaucous shrub, from six inches to a foot high. It is a very variable little plant, but not in the least liable to be taken for any other species; it assumes different appearances, according to its treatment, and the different stages of growth. The very numerous beautiful purple flowers, covering the whole plant, and produced every season, make this a valuable species. It flowers from June to August.—Native of the Cape. See the fifth species.

42. Mesembryanthemum Brevifolium; *Short-leaved Fig Marigold.* Leaves cylindric, very blunt, papulose, spreading; branches diffused. This is a slender, branched, woody shrub, two feet high, or more. It assumes very different appearances, according to its age and the treatment it receives. In the full ground under a south wall, in a poor soil, the leaves will be above an inch in length and nearly semicylindric, and the young shoots will be covered with pilescent papulæ, pointing downwards, and appearing in a microscope like minute hooks of glass or ice. Whereas the leaves in the stove, when not luxuriant, are seldom a quarter of an inch in length, and the papulæ are not pilescent.—Native of the Cape. See the fifth species.

43. Mesembryanthemum Loreum; *Leathery-stalked Fig Marigold.* Leaves semicylindric, recurved, heaped, gibbous at the inner base, and connate; stem pendulous.—Native of the Cape. See the fifth species.

44. Mesembryanthemum Filamentosum; *Thready Fig Marigold.* Leaves equilaterally triangular, acute, somewhat dotted and connate; angles rugged; branches hexangular; plant trailing on the ground; flowers purple, pretty, not showy, on peduncles two inches long, with a pair of leaves on each side.

45. Mesembryanthemum Acinaciforme; *Cimetar-leaved Fig Marigold.* Leaves cimetar-shaped, undotted, connate, rugged at the angle of the keel; petals lanceolate. Flowers large, three inches in diameter, handsome, of a very vivid shining purple. It seldom produces flowers.

46. Mesembryanthemum Forficatum; *Forked Fig Marigold.* Leaves cimetar-shaped, blunt, undotted, connate, thorny at the tip, ancipital. This is a decumbent plant, and almost herbaceous while young, but becoming shrubby by age.—Native of the Cape. See the fifth species.

47. Mesembryanthemum Spectabile; *Showy* or *Great Purple-flowered Fig Marigold.* Leaves perfoliate, very long, glaucous, dotted, quite entire, three-sided, awl-shaped at the tip; stem woody, ascending. This is a shrubby plant, not erect; flowers solitary, very large, bright purple, making a fine contrast with the very glaucous leaves and deep brown branches.—Native of the Cape. See the first species.

**** With yellow Corollas.*

48. Mesembryanthemum Edule; *Eatable Fig Marigold.* Leaves equilaterally triangular, acute, strict, undotted, connate, subserrate at the keel; stem ancipital. Flowers three inches in diameter, yellow, shining in the sun; capsule eight and sometimes ten or eleven celled. It is called Hottentots' Figs, being eaten by the Hottentots, and also by the Dutch inhabitants of the Cape; of which it is a native.

49. Mesembryanthemum Bicolorum; *Two-coloured Fig Marigold.* Leaves awl-shaped, even, dotted, distinct; stem frutescent; corollas two-coloured. Shrubby, two feet high.—Native of the Cape. See the fifth species.

50. Mesembryanthemum Aureum; *Golden Fig Marigold.* Leaves cylindric, three-sided, dotted, distinct; pistils black purple. Shrubby, scarcely capable of supporting itself upright when tall.—Native of the Cape. See the fifth species.

51. Mesembryanthemum Serratum; *Serrate-leaved Fig Marigold.* Leaves awl-shaped, three-sided, dotted, indistinct, serrate backwards at the angle of the keel. This is an elegant species, three quarters of a yard in height, with woody stems not so thick as the little finger, and not much branched, procumbent, covered with an ash-coloured bark; flowers on the upper branches, solitary, terminating, large, of an elegant yellow colour. They open several times from eight in the morning to three or four in the afternoon, if the sun shines, and have a little smell. Dillenius received it from Holland, and gives a caution constantly to raise young plants, because the old ones are very apt to perish: and it is probably for want of attending to this caution, that this species can hardly

be found in any of our collections.—Native of the Cape. See the fifth species.

52. Mesembryanthemum Micans; *Glittering Fig Marigold.* Leaves subcylindric, papulose, distinct; stem rugged; two or three feet high; leaves in pairs, overspread with glittering spangles of a greenish yellow colour; flowers large, concave; the narrow middle petals next the white filamenta being very dark, by which it is easily distinguished from all the other sorts. It varies with paler smaller flowers.—Native of the Cape.

53. Mesembryanthemum Grossum; *Gouty Fig Marigold.* Leaves subcylindric, clustered, papulose; trunk thickened at the base; branches diffused, smooth.—Native of the Cape.

54. Mesembryanthemum Brachiatum; *Three-forked Fig Marigold.* Stem and leaves cylindric, papulose; branches trichotomous.—Native of the Cape.

55. Mesembryanthemum Rostratum; *Heron-leaved Fig Marigold.* Stemless: leaves semicylindric, connate, externally tubercled. Dillenius remarks that this species is distinguished from all others by the central leaves being long and narrow, not ill representing a heron's bill.—Native of the Cape. See the fifteenth species.

56. Mesembryanthemum Compactum; *Dotted* or *Thick-leaved Fig Marigold.* Stemless: leaves connate, dotted, half round, three-sided at the tip, somewhat reflex, sharp; flowers sessile; calix subcylindric, six-cleft.—Native of the Cape; flowering in November.

57. Mesembryanthemum Veruculatum; *Spit-leaved Fig Marigold.* Leaves three-sided, cylindric, acute, connate, bowed, undotted, distinct. Stem woody, a foot or two in height, covered with an ash-coloured bark, deformed by age with irregular wide fissures; flowers in a sort of umbel at the ends of the branches from the axils of the leaves, small, pale yellow, smelling very sweet.—Native of the Cape; flowering in May and June.

58 Mesembryanthemum Molle; *Soft Fig Marigold.* Leaves three-sided, connate, erect, glaucous, undotted; branches half round; peduncles axillary, compressed.—Native of the Cape.

59. Mesembryanthemum Glaucum; *Glaucous-leaved Fig Marigold.* Leaves three-sided, acute, dotted, indistinct; calicine leaflets ovate-cordate. Stems a foot and half high, or more, woody; flowers large, pale yellow or sulphur-coloured on both sides, sometimes slightly tinged with red on the outside. They remain expanded only a few hours, and contract about noon; but open several times, and have a succession during the summer months. It is a strong upright shrub.—Native of the Cape. See the twenty-fourth species.

60. Mesembryanthemum Corniculatum; *Horned Fig Marigold.* Leaves three-sided, semicylindric, rugged-dotted, with a raised line above the base, and connate; stems half erect or reclining, scattered, round at top. The flowers continue some days, and expand about noon.—Native of the Cape.—See the twenty-fourth species.

61. Mesembryanthemum Pinnatifidum; *Pinnated Fig Marigold.* Leaves flat, oblong, pinnatifid. Root annual, not much branched, of short duration. Flowers small, solitary, on longish peduncles, yellow; expanding in the afternoon. The whole plant is sprinkled over with glittering particles like the Ice Plant, to which it bears some affinity in its duration.—Native of the Cape. See the first species.

62. Mesembryanthemum Sessiliflorum; *Sessile-flowered Fig Marigold.* Leaves flat, spatulate, both these and the stems papulose; branches divaricate; flowers sessile. Annual.—Native of the Cape. See the first species.

63. Mesembryanthemum Tortuosum; *Twisted-leaved Fig Marigold.* Leaves flattish, oblong-ovate, subpapillose, clustered connate; calices three-leaved, two-horned; stem short, thickish.—Native of the Cape. See the first species.

64. Mesembryanthemum Glabrum; *Smooth-leaved Fig Marigold.* Leaves embracing, distinct, spatulate, very smooth; peduncles the length of the leaves; calices hemispherical. Annual.—Native of the Cape. See the first species.

65. Mesembryanthemum Helianthoides; *Spatula-leaved Fig Marigold.* Leaves spatulate, flat, even; peduncles very long; calices flat at the base, angular. Annual.—Native of the Cape. See the first species.

66. Mesembryanthemum Pomeridianum; *Great-flowered Fig Marigold.* Leaves flattish, broad-lanceolate, even, subciliate, distinct; stem, peduncles, and germ, rough-haired. Root annual; stem herbaceous, a span high, scarcely thicker than a goose-quill; flowers upright, the size of the common Marigold; corolla sulphur-coloured, shining, spreading very much.—Native of the Cape. See the first species.

67. Mesembryanthemum Echinatum; *Echinated Fig Marigold.* Leaves oblong-ovate, subtriquetrous, gibbous, ramentaceous-hispid; calicine segments leaf-shaped.—Native of the Cape.

68. Mesembryanthemum Ringens; *Ringent Fig Marigold.* Almost stemless: leaves ciliate-toothed, dotted. There are several varieties of this species. That called the Dog-chap Fig Marigold is stemless while young, but acquires by age considerable trailing woody stems, with large showy yellow flowers, opening in the afternoon, and closing in the evening. The Cat-chap Fig Marigold is entirely sessile, of a whitish glaucous colour; corolla golden-coloured within, not having any tinge of red, yellow with a tinge of red on the outside.—Native of the Cape; flowers from May to June.

69. Mesembryanthemum Dolabriforme; *Hatchet-leaved Fig Marigold.* Stemless: leaves hatchet-shaped, dotted. This is a low plant at first, but grows larger and stronger; flowers of a pale yellow colour.—Native of the Cape.

70. Mesembryanthemum Difforme; *Various-leaved Fig Marigold.* Stemless: leaves difform, dotted, connate.—Native of the Cape. See the fifteenth species.

71. Mesembryanthemum Albidum; *White Fig Marigold.* Stemless: leaves three-sided, quite entire. Flowers large, yellow, on long peduncles. Native of the Cape.

72. Mesembryanthemum Linguiforme; *Tongue-leaved Fig Marigold.* Stemless: leaves tongue-shaped, thicker at one edge, undotted. The leaves of this species in all the varieties (of which there are three) are not decussated, but lie in the same oblique plane.—Native of the Cape.

73. Mesembryanthemum Pugioniforme; *Dagger-leaved Fig Marigold.* Leaves alternate, clustered, awl-shaped, three-sided, very long, undotted. This species grows up into a stem an inch and more in thickness, and two or three feet in height; with a crown of clustered leaves a span in length at top, and branches a foot long at the base, hanging down with the multitude of leaves. Flowers large, expanding when the sun shines, straw-coloured above, tinged with red underneath, composed of numerous slender cusped petals, gradually smaller, and the inner ones filamentose. The flowers open from eight or nine in the morning to four or five in the afternoon. It flowers from May to August.—Native of the Cape.

**** *With green Corollas.*

74. Mesembryanthemum Viridiflorum; *Green-flowered Fig Marigold.* Leaves semicylindric, papulose, hairy; calices five-cleft, hirsute.—Native of the Cape.

75. Mesembryanthemum Capillare. Leaves connate, round, papulose; stem upright; branchlets one-flowered, filiform, smooth.—Native of the Cape.

Mespilus; a genus of the class Icosandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, concave-spreading, five-cleft, permanent. *Corolla:* petals five, roundish, concave, inserted into the calix. *Stamina:* filamenta twenty, awl-shaped, inserted into the calix; antheræ simple. *Pistil:* germen inferior; styles five, simple, erect; stigmas headed. *Pericarp:* berry globular, umbilicated, closed by the converging calix, but almost perforated by the navel. *Seeds:* five, bony, gibbous. *Observe.* The genera of *Cratægus*, *Sorbus*, and *Mespilus*, are so very nearly allied as scarcely to be distinguished, except by the number of styles. The leaves in *Sorbus* are pinnate, in *Cratægus* angular, and in *Mespilus* commonly entire. Essential Character. *Calix:* five-cleft. *Petals:* five. *Berry:* inferior, five-seeded. —All the plants of this genus are hardy enough to thrive in the open air in England, and some of them are very ornamental plants for gardens, where, during the season of their flowering, they will make a fine appearance; and again in autumn, when their fruit is ripe, they will afford an agreeable variety, and their fruit will be a food for deer and birds: and clumps of each sort planted in different parts of the garden are exceedingly ornamental. The American kinds are usually propagated in the nurseries, by grafting or budding them upon the Common White Thorn, but the plants so propagated will never reach half the size of those which are propagated by seeds; so that those plants should always be chosen which have not been grafted or budded, but are upon their own roots. But there are many who object to raising the plants from seeds, on account of their seeds not growing the first year, as well as on account of the tediousness of their growth afterwards: but where a person can furnish himself with the fruit in autumn, and take out the seeds soon after they are ripe, putting them into the ground immediately, the plants will come up the following spring. If they are kept clean from weeds, and in very dry weather supplied with water, they will make good progress; but if they are planted in the places where they are to remain, after two years' growth from seeds, they will succeed much better than when the plants are of greater age; the ground should be well trenched, and cleansed from the roots of all bad weeds. The best time to transplant them is in autumn, when their leaves fall off; they should be constantly kept clean from weeds, and if the ground between the plants is dug every winter, it will greatly encourage the growth of the plants, so that if they are cleaned three or four times in the summer, it will be sufficient. All the sorts of Mespilus and Cratægus will take, by budding or grafting upon each other; they will also take upon the Quince or Pear stocks, and both these will take upon the Medlars; so that these have great affinity with each other.—The species are,

1. Mespilus Pyracantha; *Evergreen Thorn* or *Mespilus*. Thorny: leaves lanceolate-ovate, crenate; calices of the fruit blunt. This is a bushy irregular shrub; flowers white, scarcely larger than those of Elder; fruit globular, fulvous, the size of a pea, pulpy, five-seeded. It flowers with us in May.—Native of the south of Europe.

2. Mespilus Germanica; *Dutch Medlar*. Unarmed: leaves lanceolate, tomentose underneath; flowers sessile, solitary. This is a small or middle-sized branching tree. There are several varieties: that called the Great-leaved Dutch Medlar, bearing the largest fruit, is now generally cultivated; but the Nottingham Medlar is of a much quicker and more poignant taste. The other varieties are now little noticed.

3. Mespilus Arbutifolia; *Arbutus-leaved Mespilus*. Unarmed: leaves lanceolate, crenate, tomentose underneath. Fruit small, roundish, a little compressed, purple when ripe. It varies with red, black, and white fruit, and seldom rises more than five or six feet high in Virginia, where it is found in moist woods.

4. Mespilus Amelanchier; *Alpine Mespilus*. Unarmed: leaves oval, serrate, hirsute underneath. This rises with many slender stems, three or four feet high. The wood of this shrub is very hard, and the bark black. The flowers are white, and larger than in those of the other species. The fruit is good to eat; sweet, and reputed wholesome.—Native of the south of Europe.

5. Mespilus Chamæ-Mespilus; *Bastard Quince* or *Mespilus*. Unarmed: leaves oval, acutely serrate, smooth; flowers corymb-capitate. Stalk smooth, four or five feet high; fruit small, red.—Native of the Pyrenees, the mountains of Austria, and found by Ray on the higher parts of Mount Jura, near Geneva.

6. Mespilus Canadensis; *Snowy Mespilus*. Unarmed: leaves ovate-oblong, smooth, serrate, sharpish. A low shrub. —Native of Canada and Virginia.

7. Mespilus Japonica; *Japan Mespilus*. Unarmed: leaves oblong, blunt, serrate at the tip, tomentose underneath. This is a large lofty tree. The fruit seems rather to be a pome, with from one to five cells; and the taste of it approaches to that of the apple; it is ripe in May and June.—Native of Japan.

8. Mespilus Cotoneaster; *Dwarf Mespilus*. Unarmed: leaves ovate, quite entire, sharpish, tomentose underneath; germina smooth; berries two-seeded, or three-seeded. This is a low spreading shrub, not more than two or three feet high.—Native of many parts of Europe and Siberia.

9. Mespilus Tomentosa; *Quince-leaved Mespilus*. Unarmed: leaves ovate, quite entire, blunt, tomentose underneath; germina woolly; berries five-seeded. Stalk smooth, about eight feet high. The fruit is large and roundish, and of a fine red colour when ripe. It flowers in April and May.

Messerschmidia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments sublinear, erect, permanent. *Corolla:* one-petalled, funnel-form; tube cylindric, rude, longer than the calix, globular at the base; border five-cleft, plaited, membranaceous at the sides; throat naked. *Stamina:* filamenta five, minute, in the lower part of the tube; antheræ awl-shaped, upright, within the middle of the tube. *Pistil:* germen subovate; style cylindric, very short, permanent; stigma capitate, ovate. *Pericarp:* berry dry, suberous, cylindric-rounded, with a retuse umbilicus, surrounded with four blunt teeth, bipartile. *Seeds:* two, within each part of the pericarp, oblong, bony, incurved, outwardly rounded, inwardly angular. Essential Character. *Corolla:* funnel-form, with a naked throat. *Berry:* suberous, bipartile, each two-seeded.——The species are,

1. Messerschmidia Fruticosa. Stem shrubby; leaves petioled; corollas salver-shaped. This is a tall, rugged, rough-haired, branching shrub, with the branches panicled at the top.—Native of the Canary Islands.

2. Messerschmidia Arguzia. Stem herbaceous; leaves sessile; corollas funnel-shaped. Root creeping; stem upright, a span high; corolla white.—Native of Siberia.

Mesua; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth four-leaved; leaflets ovate, concave, blunt, permanent, the two outer smaller ones opposite. *Corolla:* petals four, retuse, waved. *Stamina:* filamenta numerous, capillary, the length of the corolla, united at the base into a pitcher; antheræ ovate. *Pistil:* germen roundish; style cylindric; stigma thickish, concave. *Pericarp:* nut roundish, acuminate, with four longitudinal raised sutures. *Seed:* single, roundish.

Essential Character. *Calix:* simple, four-leaved. *Corolla:* four-petalled. *Nut:* four-cornered, one-seeded. ——The only known species is,

1. Mesua Ferrea; *Indian Rose-chestnut.* Rheede says, it is much cultivated in Malabar, for the beauty of the flowers, which come out there in July and August; and that it bears fruit in six years from the nut, continuing frequently to bear during three centuries. He describes it as a very large tree, spreading like the Lime, with flowers the size and shape of the Sweet-briar or Eglantine, but with only four white petals; fruit when it begins to ripen smooth and greenish, but rufous and wrinkled when ripe, with a rind like that of the Chestnut, and three or four kernels within, the shape and size, substance and taste, of Chestnuts.—It may be increased by seeds, layers, and cuttings.

Metrosideros; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, half superior. *Corolla:* petals five, concave, nearly sessile, deciduous. *Stamina:* very long, standing out, free or separate; antheræ incumbent. *Pistil:* germen turbinate, fastened to the bottom of the calix; style filiform, erect; stigma simple, small, scarcely dilated. *Pericarp:* capsule three-celled, (sometimes four-celled,) three-valved, (sometimes four-valved,) partly covered with the belly of the calix. *Seeds:* very numerous, when unripe linear, chaffy; when ripe very few, rounded or angular. Essential Character. *Calix:* five-cleft, half-superior. *Petals:* five. *Stamina:* very long, standing out. *Stigma:* simple. *Capsule:* three-celled.——The species are,

1. Metrosideros Hispida. Leaves opposite, cordate at the base, embracing; branchlets, peduncles, and calices hispid. Stem usually four or five feet high; flowers large, and white. This is a magnificent species.—Native of New South Wales.

2. Mestrosideros Floribunda. Leaves opposite, petioled, ovate-lanceolate; panicle brachiate; pedicels umbelled. Flowers copious, white.—Native of New South Wales.

3. Metrosideros Costata. Leaves opposite, petioled, linear-lanceolate, acuminate, oblique; panicle brachiate, decompound; pedicels subumbelled. Flowers yellowish-white, larger than those of the preceding.—Native of New South Wales.

4. Metrosideros Diffusa. Leaves opposite, ovate, veined, smooth on both sides; panicles axillary or terminating; pedicels opposite.—Native of New Zealand.

5. Metrosideros Villosa. Leaves opposite, ovate, veined, pubescent underneath; thyrse axillary or terminating, opposite, villose; flowers sessile, clustered. This strongly resembles the preceding species.—Native of Otaheite.

6. Metrosideros Florida. Leaves opposite, obovate-oblong, veined, smooth; thyrse terminating; calices turbinate, naked. Flowers large, crimson.—Native of New Zealand.

7. Metrosideros Glomulifera. Leaves opposite, ovate, netted-veined, pubescent underneath; heads lateral, peduncled, both they and the bractes tomentose. Flowers whitish. This speoies is slightly aromatic. Native of New South Wales.

8. Metrosideros Angustifolia. Leaves opposite, linear-lanceolate, naked; peduncles axillary, umbelled; bractes lanceolate, smooth, deciduous.—Native of the Cape.

9. Metrosideros Ciliata. Leaves scattered, almost opposite, elliptic, blunt, coriaceous, subciliate at the base; corymbs terminating, hairy. A bushy shrub; flowers large, handsome, of a deep red colour.—Native of New South Wales.

10. Metrosideros Linearis. Leaves scattered, linear, channelled, acute, becoming rigid; flowers lateral. clustered, sessile.—Native of New South Wales.

11. Metrosideros Lanceolata. Leaves alternate, lanceolate, mucronate; flowers lateral, clustered, sessile, pubescent. This is a beautiful shrub.—Native of New South Wales.

12. Metrosideros Saligna. Leaves alternate, lanceolate, attenuated to both ends, mucronate; flowers lateral, clustered, sessile, smooth.—Native of New South Wales.

13. Metrosideros Capitata. Leaves scattered, obovate, mucronulate; heads terminating; calices and branchlets hairy.—Native of New South Wales.

Meutang. The name of a flower much esteemed by the Chinese, and which they call King of Flowers. It is larger than our rose, resembles it in figure, and is more expanded; yet falls short of it in fragrance, but exceeds it in beauty. It has no prickles, and its colour is a mixture of white with purple, but so as to incline most to white, though sometimes they are found of a reddish and of a yellow colour. The tree it grows upon is not unlike our Alder tree, and is cultivated with great care all over China, being covered in the summer time with a shade, to defend it from the scorching beams of the sun.—We are not aware that botanical writers have assigned it a place in the systematical arrangement.

Mazereon. See *Daphne.*

Mice, are highly destructive to several sorts of garden crops, such as pease, beans, &c. in the early spring; and Lettuces, Melons, and Cucumbers, in frames in the winter season. It is supposed also that the destruction of grain after it is sown, is in some seasons very great, owing to the field mice. Hence the tussocks of wheat, seen to arise in many fields, are produced from the granaries of these diminutive animals; which, when they are accidentally destroyed, grows into a tuft, and have been found to contain nearly a handful of corn. Their habitations are detected by small mounds of earth being thrown up, on or near the apertures of their dwellings, or of the passages which lead to their nests and granaries; by following the course of which, they and their progeny may be found and destroyed. It is found that acorns when sown, as well as garden beans and peas, are liable to be dug up or devoured by these voracious little animals. They may be destroyed by traps baited with cheese, and also by the poisonous substance usually called *nux vomica,* which should be finely rasped down, and mixed with some sort of meal, or other similar material of which they are fond; but the easiest, cheapest, and most effectual mode of extirpating these little plunderers, is to encourage the breed of owls, so active in the pursuit of nocturnal vermin, and on that account so useful to the gardener and farmer, who nevertheless still inconsiderately permit their servants and children to destroy their eggs, and torture and kill their callow young. See *Vermin.*

Michauxia; a genus of the class Octandria, order Monogynia.—Generic Character.. *Calix:* perianth one-leafed, sixteen-parted; segments lanceolate, unequal, the alternate ones reversed. *Corolla:* one-petalled, wheel-shaped, eight-parted, larger than the calix; segments linear-lanceolate, spreading very much, revolute at the tip; nectary eight-valved, staminiferous. *Stamina:* filamenta eight, awl-shaped, permanent; antheræ linear, very long, pressed close to the style. *Pistil:* germen inferior, turbinate; style columnar, permanent; stigma eight-parted; segments awl-shaped, revolute. *Pericarp:* capsule turbinate, truncated, eight-celled, valveless; cells *rhombed. Seeds:* very numerous, small, oblong, inserted into the receptacles. Essential Character. *Calix:* sixteen-parted. *Corolla:* wheel-shaped, eight-parted. *Nectary:* eight-valved, staminiferous. *Capsules:* eight-celled, many seeded.——The only species is,

1. Michauxia Campanuloides; *Rough-leaved Michauxia.* Stem simple, panicled when in flower, upright, herbaceous,

rough-haired, green, two feet high, the thickness of the little finger. It is a handsome plant, with the habit of a Campanula.—Native of the Levant. The seeds have not ripened in this country; so that being a biennial, we cannot keep it at present. It requires the protection of the green-house.

Michelia; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* perianth three-leaved, leaflets petal-form, oblong, concave, deciduous. *Corolla:* petals fifteen, lanceolate; the outer ones larger. *Stamina:* filamenta very many, awl-shaped, very short; antheræ erect, acute. *Pistil:* germina numerous, imbricate, in a long spike; styles none; stamina reflex, blunt. *Pericarp:* berries (berried capsules) as many as the germina, globular, one-celled, half-bivalved; according to Gærtner, dispersed in a raceme. *Seeds:* four, (from two to eight, according to Gærtner,) convex on one side, angular on the other. Essential Character. *Calix:* three-leaved. *Petals:* sixteen. *Berries:* many, four-seeded.——The species are,

1. Michelia Champaca. Leaves lanceolate; calices externally silky. This is a lofty tree, with a trunk as large as a man can compass, covered with a thick ash-coloured bark; flowers deep yellow, on the extreme twigs, axillary, on thick upright peduncles an inch and half in length, and having a very fragrant smell; fruit resembling a large bunch of grapes, pale yellowish-white, of an acrid taste.—Native of Malabar.

2. Michelia Tsjampaca. Leaves lanceolate, ovate; calices nearly smooth.—Native of the East Indies.

Micropus; a genus of the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common, inferior five-leaved; leaflets thin, small, obsolete; interior very large, five-leaved; leaflets loose, distinct, helmet-shaped, compressed, converging longitudinally by the margin. *Corolla:* compound of ten hermaphrodites in the disk, and five females in the circuit: proper of the hermaphrodite one-petalled, funnel-form, five-toothed, erect; of the female none. *Stamina:* in the hermaphrodites; filamenta five, bristle-shaped, very short; antheræ cylindric, tubular, the length of the corollet. *Pistil:* in the hermaphrodites; germen obsolete; style filiform, longer than the stamina; stigma obsolete. In the females; germen obovate, compressed, within each scale of the common inner calix; style from the inner side of the germen, bristle-shaped, bent in towards the hermaphrodites, the length of the calix; stigma two-parted, slender, acuminate. *Pericarp:* none; calix unchanged, but the inner one larger, indurated. *Seeds:* of the hermaphrodites, none; of the females, solitary, obovate, included in the proper leaflet of the inner calix; down none. *Receptacle:* with sharp very small chaffs, separating the seeds of the females, but not the florets of the disk. Essential Character. *Calix:* calicled. *Ray:* of the corolla, none. *Female florets:* wrapped up in the calicine scales. *Down:* none. *Receptacle:* chaffy.——The species are,

1. Micropus Supinus; *Trailing Micropus.* Stem procumbent; leaves in pairs. It is an annual plant. The roots send out several trailing stalks, six or eight inches long, divaricating, often branched, covered with a white nap, as is the whole plant. Flowers in small clusters, very small, white. —Native of Portugal, Spain, Italy, and the Levant. This is sometimes preserved in gardens for the beauty of its silvery leaves. If the seeds be sown in autumn, or permitted to scatter, the plants will come up in the spring, and require only to be kept clean from weeds, and thinned where too close.

2. Micropus Erectes. Stem upright; calices toothless; flowers solitary. This also is an annual.—Native of Spain, France, and the Levant.

Microtea; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* perianth five-leaved; leaflets oblong, permanent. *Corolla:* none. *Stamina:* filamenta five, filiform, the length of the calix, inserted into the receptacle; antheræ subglobular, twin. *Pistil:* germen superior, subglobular, echinated; styles two, very short, divaricating; stigmas simple, acute. *Pericarp:* drupe dry, coriaceous, thin, echinated. *Seed:* nut roundish, smooth, with a single kernel. Essential Character. *Calix:* five-leaved, spreading. *Corolla:* none. *Drupe:* dry, echinated.——The only known species is,

1. Microtea Debilis. Stem herbaceous, branched, diffused, almost upright, striated, smooth. Annual.—Native of most of the West India Islands.

Miegia; a genus of the class Triandria, order Monogynia. —Generic Character. *Calix:* glume one-flowered, two-valved; valves ovate, concave, nerved; upper valve shorter, blunt; lower a little longer, sharpish. *Corolla:* two-valved; valves ventricose, nerved; outer ovate, blunt within, and longer than the calicine valve; inner oblong, compressed at the tip, sharpish, the edges convoluted, longer than the outer, within the upper calicine valve; nectary one-leafed, ovate, gibbous at the back, somewhat compressed, acute, even, thick, suberous, thinner at the tip and edges, shorter than the corolla, opposite to the larger corolline glume, involving the germen. *Stamina:* filamenta three, capillary, longer than the corolla; antheræ oblong, acute. *Pistil:* germen oblong, subtriquetrous, within the nectary; style simple, capillary, longer than the corolla; stigmas two, capillary. *Pericarp:* none. *Seeds:* single, oblong, triquetrous-rounded, rolled up in the nectary, inclosed within the permanent calix and corolla. Essential Character. *Calix:* one-flowered; and *Corolla:* two-valved. *Nectary:* one-valved, involving the germen. *Seed:* triquetrous-rounded, included within the calix, corolla, and nectary.——The only known species is,

1. Miegia Maritima. Root creeping; culms half a foot high, covered with leaves, branched at the top; leaves lanceolate, striated, acute, rigid; panicle terminating, contracted into an ovate spike.—Native Cayenne and Guiana.

Mignonette. See *Reseda.*

Mildew, is a disease in plants, caused by a dewy moisture which falls on them, and continuing, for want of the sun's heat to draw it up, by its acrimony corrodes, gnaws, and spoils the plant; or, *mildew* is rather a concrete substance which exsudes through the pores of the leaves. What gardeners call Mildew, is an insect, found in great plenty, preying upon this exsudation. All plants, whether cultivated or spontaneous, appear to be equally liable to it. It has been attributed to fogs and dews, to the vicinity of rivers and of stagnant waters, to the putrid effluvia of animal or vegetable substances, and to late frosts; but upon no better foundation than mere conjecture. It attacks the blades and stems of corn, which it covers with a powder of the colour of the rust of iron, when at the height of their vegetation. High and ventilated situations are perhaps most likely to admit of a remedy, but are equally liable with low grounds. Plentiful rains sometimes wash it almost entirely away, so that the grain suffers but little in the end. Late crops have generally suffered most, says Mr. Lambert, but there have been instances of the reverse. Others say, that low lands and sheltered situations have suffered most; but this has been perhaps attributable to the wheat growing more luxuriantly, from its situation, than the stamina of the land could support when it was arriving at maturity; to which may be added, a want of ventillation. A huge crop may be considered a cause of mildew; for an unfavourable season, or a want of stamina

in the land, may check the vegetable mucilage before the corn is filled, and thereby produce a predisposition to mildew. No difference is observed in new and old seed, in similar stuations. The first cause of mildew appears to be a predisposition in the wheat, occasioned by a decrease of mucilage in the straw, which allows the watery particles to insinuate themselves, and still further check the circulation of the juices in the stem that are necessary to the perfection of the grain, and had before become languid from the unkindness of the season, or the feebleness of the soil. When the watery particles have insinuated themselves, the straw becomes discoloured, and probably a complete putrefaction would immediately succeed, if it were not prevented by a circulation of air. At all times during their growth, the straw of Barley and Oats appears to have sufficient mucilage in itself to resist the effects of the watery particles; but when it is once cut, it becomes like the stubble in the fields, and cannot resist it much longer. Fallows and layers have been equally liable. An over luxuriant growth in the spring is favourable to the mildew, and that distemper may be produced by particular manure, such as green vetches, &c. ploughed in, which seem to cause a considerable fermentation in the soil, and produce a rapid vegetation for a short time. It seems perfectly reasonable, from the above statement, to look for the cause of the disease, in a *standing crop*, in the state of the atmosphere; for nothing is so likely to bring on the fatal predisposition of the plants, as a succession of cold rains while the grain is forming. The coolness necessarily gives a check to the rich saccharine juices which are then rising towards the ear, and the moisture may at the same time assist the seeds of the fungi to germinate and take root. Thus reason and facts concur, says Sir Joseph Banks, in pointing out the cause and operation of the disease. There appear to be two reasons why corn which happens to be struck with this disease in a dry warm summer, is exposed to that excessive injury by which experience proves it suffers. The habits of the plants render them more susceptible of injury, their rich juices more liable to be checked, and the seeds of fungi, it is probable, are more widely, if not more plentifully, distributed by such a state of the air, than they are by a cool moist atmosphere.—The natural event is too well known. A certain prevention of it, says Mr. Marshal, would be a discovery worth millions to the country. Until this be made, let the grower of wheat not only endeavour to sow early, but let him look narrowly to his crop during the critical time of the filling of the grain; and whenever he may perceive it to be smitten with the disease, let him lose no time in cutting it; suffering it to lie on the stubble until the straw be firm and crisp enough to be set in sheaves, without adhering in the binding places; allowing it to remain in the field until the grain shall have received all the nutriment which it can derive from the straw. Where wheat has been grown on Lammas land, and the ground obliged to be cleared by the first of August, it has been known to cut "as green as grass," and to be carried off and spread upon grass-lands to dry; yet the grain has been found to mature, and always to afford a fine-skinned beautiful sample. Rye-grass that is cut even while in blossom, is well known to mature its seeds with the sap that is lodged in the stems. Hence there is nothing to fear from cutting wheat or corn before the straw be ripe. This is also the opinion of Mr. Young; he therefore advises the farmer to be very attentive to his wheat crops in July, as they are every where liable to this fatal distemper, which admits but of one cure or check, and that is, reaping it as soon as it is struck. The capital managers in Suffolk know well, that every hour the Wheat stands after the mildew appears, is mischievous to the crop. It should be cut, though quite green, as it is found that the grain fills after it is cut, and ripens in a manner that those would not conceive who had not tried the experiment, as Mr. Young has done many times, by reaping so early, that the labourers pronounced he should have nothing but hen's meat: yet they were always mistaken; for the sample proved good, while the grain of others which stood longer suffered severely It may be asked, in what manner cutting down the crop, as soon as it is found to be diseased, can operate so easily as a remedy? but to the practical farmer, *the fact* only is necessary. The operation of the remedy and of the disease are equally indifferent to him. Those who have profited by the remedy here recommended, believe that it kills the mildew. And if it shall appear that the fungus of wheat requires a free supply of air to keep it alive, or in a state of health and vigour, the effect of cutting down the crop will be explained. It will perhaps be found, by experience, that the closer it is allowed to lie upon the ground, and the sooner it is bound up in sheaves, (provided the natural ascent of the sap to the ear be not interrupted,) the more effectual and complete will be the remedy. Further, on the evidence of attentive observation, if Wheat, which has been attacked by this disease, be suffered to remain in the field, with the ears exposed, until it may have received the ameliorating influence of dews, or moderate rain, (to soften, relax, and assist the natural rise of the sap,) the more productive it will probably become. And it may be still further added, that grain cut while under-ripe, is still less liable to be injured in the field by moist weather, than that which has stood until it be fully or over-ripe.—A probable means of prevention, for the reasons already given, to induce early ripeness, either by sowing early, or by forcing manures; or by selecting and establishing early varieties of Wheat especially, like early varieties of Pease, and other esculent plants raised by the gardeners; is a work which only requires ordinary attention, and which, it is hoped, will be zealously encouraged by every attentive promoter of rural improvements in the united kingdom.

Mildew, in Gardening. In addition to what we have presented our readers with, under the article *Blight*, we here wish to add, that it is advised, whenever danger is apprehended, to wash or sprinkle the trees well with urine and lime-water mixed; and when the young and tender shoots are much infected, to wash them well with a woollen cloth dipped in the following mixture, so as to clear them of all the glutinous matter, that their respiration and perspiration may not be obstructed: Take of tobacco one pound, sulphur two pounds, unslaked lime one peck, and about a pound of Elder buds; pour on them ten gallons of boiling water; cover it close, and let it stand till cold; then add as much cold water as will fill a hogshead. It should stand two or three days to settle, when the scum may be taken off, and it is fit for use. This treatment is equally proper for those trees affected with what is vulgarly called *honey-dew*, which is a viscous exsudation, closing up their pores, and obstructing their perspiration.

Milfoil. See *Achillea.*

Milium; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume one-flowered, two-valved; valves ovate, acuminate, almost equal. *Corolla:* two-valved, less than the calix; valves ovate, one less; nectary two-leaved; leaflets ovate, obtuse, gibbous at the base. *Stamina:* filamenta three, capillary, very short; antheræ oblong. *Pistil:* germen roundish; styles two, capillary; stigmas pencil-form. *Pericarp:* none. *Seed:* single, covered, roundish. Essential Character. *Calix:* two-valved, one-flowered; valves almost equal. *Corolla:* very short. *Stigmas:* pencil-form.——The species are,

1. Milium Capense; *Cape Millet Grass.* Panicle capillary; calices acuminate; awn of the corolla terminating, curved.—Native of the Cape.

2. Milium Punctatum; *Dotted Millet Grass.* Branches of the panicle quite simple; flowers alternate, in pairs, directed one way. Culm from one to two feet high, even, very tender.—Native of the moist meadows of Jamaica.

3. Milium Lendigerum; *Yellow-spiked Millet Grass.* Panicle subspiked; flowers awned. It is a very small annual plant, extremely hard to ascertain, from the difficulty of seeing its characters.—Native of Portugal, the south of France, and England; it is found in the Isle of Sheppey; at Gillingham, in Norfolk; and near Weymouth.

4. Milium Compressum; *Compressed Millet Grass.* Spikes generally in threes; florets alternate, awnless, pressed close to the rachis; culm jointed, compressed in the middle; peduncled, very long. Perennial.—Native of the West Indies.

5. Milium Digitatum; *Fingered Millet Grass.* Spikes digitated, generally in fours, subsessile; florets awnless, pressed close, directed one way; leaves cartilaginous-serrate at the edge. Annual.—Native of Jamaica.

6. Milium Paniceum; *Panic Millet Grass.* Spikes subdigitate, alternate, approximating, filiform; florets directed one way, awnless, pressed close, three-cornered.—Native of Jamaica.

7. Milium Effusum; *Common Millet Grass.* Flowers panicled, dispersed, awnless. Root perennial and creeping; culms slender, three or four feet high, with about four joints. It appears to be much scattered, from the various length of the pedicels, which grow in whorls, and give this grass an airy, light, and elegant appearance. The height it usually attains, the situation in which it grows, and the delicacy of its panicle, distinguish this from all other grasses.—Native of woods, in most parts of Europe; flowering in May.

8. Milium Confertum; *Clustered Millet Grass.* Flowers panicled, clustered. Haller regards this to be a mere variety of the preceding, which it greatly resembles.—Native of Germany and Switzerland, where it is found in woods.

9. Milium Globosum; *Globular Millet Grass.* Panicle patulous; glumes awnless; pedicels with a yellow belt. Culm simple, a foot high.—Native of Japan.

10. Milium Paradoxum; *Black-seeded Millet Grass.* Flowers panicled, awned. This species resembles the reed. Root annual; culm a foot and half to four feet high. It flowers in July.—Native of Carniola, and the south of France.

11. Milium Villosum; *Woolly Millet Grass.* Panicle lax; florets awnless; calices woolly. Annual.—Native of Jamaica. Browne says that the roots and leaves pounded, and externally applied, cure sores and ulcers of all sorts with more certainty than most other things used for that purpose. It is a strong detersive and agglutinant; and, doubtless, would make an excellent ingredient in vulnerary apozems and infusions.

12. Milium Ramosum; *Branched Millet Grass.* Culm branched; flowers panicled, usually in pairs, hirsute.—Native of the East Indies.

13. Milium Amphicarpon. Culms many, cylindrical, vaginated; leaves lato-linear, striated; male flowers alternate, pedunculate; female flowers in one-flowered scapes, radical, vaginate.—It grows in the light sandy fields of New Jersey, near Egg harbour; and flowers in July and August.

14. Milium Angulosum; *Little Angular-husked Millet Grass.* Flowers closely panicled, awnless; glumes ovate-acute, strongly ribbed and furrowed; sheaths of the leaves hairy.—Found in the Sandwich Islands.

Milk Vetch. See *Astragalus*, and *Phaca*.

Milkwort. See *Polygala*, and *Euphorbia*.

Milleria; so called, in honour of Philip Miller, F. R. S. author of the *Gardener's Dictionary* and *Kalendar*. Linneus observes, that "this American plant, the closely shut calix of which entirely surrounds and protects its one or two seeds, is well bestowed on a man who spared no pains in procuring rare American seeds, and in contrivances for preserving and communicating them."—This genus belongs to the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common one-leafed, three-parted, very large, converging into a plane three-sided form, permanent; the two inner leaflets equal, subovate, acute, flat; the outer twice as large, roundish, acuminate, flat, cordate, more deeply divided from the rest. *Corolla:* compound half radiate; corollets hermaphrodite, two, within the smaller calicine leaflets: female one, within the large calicine leaflets: proper of the hermaphrodites one-petalled, tubular, erect, five-toothed; of the female ligulate, erect, blunt, concave, emarginate. *Stamina:* in the hermaphrodites, filamenta five, capillary; antheræ as many, erect, linear, connected by the middle of their sides, the length of the corolla, acute. *Pistil:* in the hermaphrodites, germen oblong, very slender; style filiform, the length of the corollet; stigmas two, linear, weak, blunt, spreading: in the females, germen large, three-cornered; style filiform, the length of the corollet; stigmas two, bristle-shaped, reflex, long. *Pericarp:* none; calix converging into a three-cornered figure. *Seeds:* in the hermaphrodites none; in the females solitary, narrower towards the base, blunt, oblong, three-sided; down none. *Receptacle:* common very small, naked. *Observe.* In the first species the female corollet is trifid, and there are four hermaphrodite tubular corollets; calix two-valved; style of the male simple; of the female bifid; the calices have always from seven to nine flowers. Essential Character. *Calix:* three-valved. *Ray* of the corolla: halved. *Down:* none. *Receptacle:* naked.——The species are,

1. Milleria Quinqueflora; *Five-flowered Milleria.* Leaves cordate; peduncles dichotomous; calices double. Stem two feet high, stiff, smooth, grooved, brachiate; spikes of flowers yellow. Root annual. There is a variety with stalks six or seven feet high.—Native of Campeachy. To propagate this and the rest of the plants of this genus, sow the seeds early in the spring on a moderate hot-bed. When the plants are about two inches high, transplant each into a separate pot filled with light rich earth; plunge them into a moderate hot-bed of tanner's bark; shade them until they have taken root; and water them frequently: then raise the glasses every day, to give them a large share of free air when the weather is warm; and continue to water them duly, for they are very thirsty plants. In a month, they will rise to a considerable height; and should then be shifted into larger pots, and plunged into the bark-bed, where they may have room to grow, especially the first species. In the middle of July, they will begin to flower; and the seeds will be ripe in a month or six weeks after. Gather them when they begin to change of a dark brown colour; for they soon fall off. They will continue flowering till Michaelmas, or later, if the season prove favourable; but when the cold of autumn comes on, they soon decay.

2. Milleria Biflora; *Two-flowered Milleria.* Leaves ovate; peduncles quite simple; calices simple. Annual: rising with an herbaceous stalk upwards of two feet high, branching out at a small distance from the root into three or four slender stalks. The flowers come out at the footstalks of the leaves in small clusters. There is a three-flowered variety, with smaller calices.—Native of Campeachy.

3. Milleria Contrayerba. Stem grooved; branches opposite, decussated; leaves lanceolate, serrate; flowers glomerate.

Annual. Stem red, grooved, three feet high; branches somewhat spreading, and villose.—Native of Peru.

Millet Cyperus Grass. See *Scirpus.*

Millet, Indian. See *Holcus.*

Mimosa; a genus of the class Polygamia, order Moncœcia. —Generic Character. *Calix:* perianth one-leafed, five-toothed, very small. *Corolla:* petal one, funnel-form, half five-cleft, small. *Stamina:* filamenta capillary, very long; antheræ incumbent. *Pistil:* germen oblong; style filiform, shorter than the stamina; stigma truncated. *Pericarp:* legume long, with several transverse partitions. *Seeds:* many roundish, of various forms. *Observe.* No part of the fructification is constant in this genus. Essential Character. *Calix:* five-toothed. *Corolla:* five-cleft. *Stamina:* five or more. *Pistil:* one. *Legume:* superior, with many cells. Some *male* flowers.—Most of the plants of this genus are propagated by seeds, which seldom ripening in this country, must be procured from America, particularly at Campeachy, where there is a great variety; many sorts of which have been hitherto unknown to botanical writers. In bringing over the seeds of these trees, they should be taken out of the pods when gathered, and packed up in papers; and ought to have tobacco, or some other noxious herb, put between the papers, to keep off insects; otherwise the seeds will be eaten or destroyed before they arrive in England; for the insects deposit their eggs in small punctures, which they make in the pods; and as these are soon hatched, so they immediately attack the seed for food, and eat holes through them, by which they are entirely spoiled.——The species are,

**With simple Leaves.*

1. Mimosa Verticillata; *Whorl-leaved Mimosa.* Unarmed: leaves whorled, linear, pungent.—Native of New South Wales; flowering from March to May.

2. Mimosa Simplicifolia; *Simple-leaved Mimosa.* Unarmed, arboreous: leaves ovate, quite entire, nerved, blunt; spikes globular, peduncled. This is a beautiful little tree, with a smooth ash-coloured bark, and large leaves, very flat. When not in flower, it has no appearance of a Mimosa.—Native of the island of Tanna, in the South Seas.

3. Mimosa Myrtifolia. *Myrtle-leaved Mimosa.* Leaves elliptic, lanceolate, oblique, quite entire, cartilaginous at the edge; heads in axillary racemes; legumes linear, with a thick edge. The foliage is usually edged with red. It is a shrub three or four feet high, of a quick growth, and a ready blower: the flowers on the young branches are very numerous and fragrant, like those of Spiræa Ulmaria.—Native of New South Wales.

4. Mimosa Suaveolens; *Sweet-scented Mimosa.* Leaves linear, acuminate, straight, cartilaginous at the edge; the primordial ones pinnate; branches triquetrous. The branches are most acutely triangular, and much compressed; their edges bright red; flowers in axillary racemes, yellowish-white, fragrant.—Native of New South Wales.

5. Mimosa Hispidula; *Little Harsh Mimosa.* Leaves elliptical, oblique, rugged on each side and at the margin; branchlets hispid, pubescent; heads solitary. It forms a thick rigid bush; flowers pale yellow, many together, in little round heads.—Native of Port Jackson, in New South Wales.

***With leaves simply pinnate.*

6. Mimosa Alba; *White Mimosa.* Unarmed: leaves pinnate, trijugous; pinnas equal, ovate-acuminate; petiole submargined.—Native of Cayenne.

7. Mimosa Inga; *Large-leaved Mimosa,* or *Inga Tree.* Unarmed: leaves pinnate, five-paired, petiole margined, jointed. This is a tree from fifteen to twenty feet high.—Native of the West Indies, on the banks of rivers.

8. Mimosa Laurina; *Laurel-leaved Mimosa.* Unarmed: leaves pinnate, two-paired; pinnas ovate, shining, almost equal; petiole linear, angular; spikes axillary, solitary.—Native of the island of St. Christopher's, in the West Indies.

9. Mimosa Fagifolia; *Beech-leaved Mimosa.* Unarmed: leaves pinnate, two-paired; petiole margined. This is a tree thirty feet high, with an elegant close head, and a straight trunk, ten feet long, and a foot in diameter: the wood is whitish, and the bark gray. Legume coriaceous, whitish-yellow, inclosing a sweet whitish pulp, which is sucked by the natives. In Martinico, both tree and fruit are called *Pois Doux,* Sweet Pea.—Native of the West Indies.

10. Mimosa Nodosa; *Knobbed Mimosa.* Unarmed: leaves pinnate, two-paired; inner pinnas smaller; petiole linear. A small tree.—Native of Ceylon and Cochin-china.

11. Mimosa Pilosa; *Hairy-leaved Mimosa.* Unarmed: leaves pinnate, many-paired, very hairy; heads terminating; legumes straight, slender. This is an upright shrub, four feet high, hairy, with spreading branches.—Native of the woods of Cochin-china.

12. Mimosa Xylocarpa; *Wood-fruited Mimosa.* Leaves scattered, in pairs, pinnate; leaflets from two to four paired, entire, oblong, smooth; the outer pair largest; glands on the petioles; stipules lanceolate. Trunk straight; bark brown, pretty smooth; branches numerous.—This is one of the largest species of the genus. It is a native of the mountainous parts of the Circars only; casting its leaves during the cold season, and flowering at the beginning of the hot season. The wood is of a chocolate colour towards the centre. The natives esteem it much, and use it for many purposes, where hard, durable, tough timber is required: for plough-heads it is particularly in request, the Telingas seldom using iron in their ploughs.

****With bigeminate* or *tergeminate Leaves.*

13. Mimosa Bigemina; *Sharp Four-leaved Mimosa.* Unarmed: leaves bigeminate, acuminate. A tree, with alternate leaves, and flowers in panicles from the axils and ends of the branches.—Native of the East Indies.

14. Mimosa Unguis Cati; *Blunt Four-leaved Mimosa.* Thorny: leaves bigeminate, blunt. This is a small tree, from seven to ten feet high, with a branched and unarmed trunk. Browne calls it the *Black-bead Shrub,* or *Large-leaved Mimosa.* Miller says it is called *Doctor Long,* and that the seeds are frequently brought to England by that name. According to Sloane, the seeds are eaten by goats, and sometimes by the negroes. The bark is very astringent, and is used in lotions and fomentations in America.—Native of Jamaica, and other West India islands.

15. Mimosa Tergemina; *Tergeminate Mimosa.* Unarmed: leaves tergeminate.—Native of the West Indies.

16. Mimosa Dulcis; *Sweet-tasted Mimosa.* Thorns stipular; leaves bigeminate; leaflets obliquely oblong, smooth, pointed. Trunk ill-shaped. Legume swelled, particularly at the seeds, twisted like a screw, downy; valves thin; when ripe, opening naturally, and exposing to view the pulp, which is rose-coloured. This is probably not a native of India; but was introduced from the Philippine islands, for the sake of the pulp which fills the legumes. It grows quickly to a tree in a rich sandy soil; and flowers in the cold season. The fleshy pulp of the legumes is reckoned wholesome; it is sweet, but insipid, and dryish. The Spaniards, at Manilla, raise many of the trees for the sake of this pulp, and call it Sappan fruit. It would assist the poor, in times of scarcity in those countries; and the gum, wood, and bark, may turn to account there. As it grows very fast, it may also be reared for fences, instead of many less useful bushes and trees.

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P. 131.

MYRTUS ___ *The Roman Myrtle.*

P. 156.

R. Hicks sc.

MIMOSA HOUSTONI ____ *Houston's Mimosa.*

The Double-flowering Myrtle.

Publishid by Nuttall, Fisher & Dixon, Liverpool. Oct. 1818.

17. Mimosa Mellifera; *Honied Mimosa.* Thorny: leaves bigeminate, blunt; prickles recurved.—Native of Egypt.

*****Leaves conjugate, and at the same time pinnate.*

18. Mimosa Latifolia; *Broad-leaved Mimosa.* Unarmed: leaves conjugate; pinnas terminating, opposite, lateral ones alternate. Flowers purple.—Native of South America.

19. Mimosa Purpurea; *Purple Mimosa,* or *Soldier Wood.* Unarmed: leaves conjugate, pinnate; inmost pinnas smaller. Flowers purple.—Native of South America.

20. Mimosa Reticulata; *Netted Mimosa.* Spines stipular; leaves conjugate; leaflets six-paired; petioles terminated by a gland and a prickle. This is a tree with rigid branches, that are flexuose from bud to bud.—Native of the Cape.

21. Mimosa Viva; *Lively Sensitive Mimosa.* Unarmed: leaves conjugate, pinnate; the partial ones four-paired, roundish; stem herbaceous. Stalks trailing, herbaceous, putting out roots at every joint, and spreading to a considerable distance. This species is so very sensitive, as to contract its leaves on every slight touch, or change of the atmosphere; even a puff of breath from the mouth will make an impression on it.—Native of the pastures and savannas of Jamaica.

22. Mimosa Circinalis; *Spiral Mimosa.* Prickly: leaves conjugate, pinnate; pinnas equal; stipules spinose. The seeds, which are flat, and one half of a beautiful red colour, the other half of a deep black, grow in long twisted pods; hanging by a small thread for some time out of the pod: when ripe, they make a very agreeable appearance.—Native of the Bahama Islands.

23. Mimosa Cineraria; *Ash-coloured Mimosa.* Prickly: leaves conjugate, pinnate; pinnas equal; prickles curved inwards. This prickly shrub is common in most of the sugar colonies, especially in Antigua; where the leaves are frequently used, mixed with corn, for their riding horses, and is thought to free them from botts and worms.—Linneus says it is a native of the East Indies.

24. Mimosa Casta; *Chaste Sensitive Mimosa.* Prickly: leaves conjugate, pinnate; partial ones three-paired, almost equal.—Native of the East Indies.

25. Mimosa Sensitiva; *Sensitive Plant.* Prickly: leaves conjugate, pinnate; partial ones two-paired; the inmost very small. Stalk woody, slender, seven or eight feet high, armed with sharp recurved thorns. The leaves move but slowly, when touched; but the footstalks fall, when they are pressed pretty hard.—Native of Brazil.

26. Mimosa Pudica; *Humble Plant.* Prickly: leaves subdigitate, pinnate; stem hispid. Roots composed of many hairy fibres, which mat close together; from which come out several woody stalks, which decline towards the ground, unless they are supported; they are armed with short recurved spines, and have winged or pinnate leaves, composed of four or five pinnas, spreading upwards like the fingers of a hand; flowers collected in small globular heads, of a yellow colour. —Native of Brazil. It is the most common of any species in the islands of the West Indies, and in the English gardens. The seeds are sold in the seed shops by the name of Humble Plant. It would be to little purpose to trouble the reader with the several idle stories related of these plants by travellers; nor to insert what has been said by others, who have attempted to account for the motion of the leaves of these plants on their being touched. "Naturalists," says Dr. Darwin, "have not explained the immediate cause of the collapsing of the Sensitive Plant; the leaves meet and close in the night, during the sleep of the plant, which, in Sweden, according to Linneus, is from six in the evening to three in the morning, during the months of June and July; or when exposed to much cold in the day-time, in the same manner as when they are affected by external violence; folding their upper surfaces together, and in part over each other like scales or tiles, so as to expose as little of the upper surface as may be to the air; but do not indeed collapse quite so far, for when touched in the night during their sleep, they fall still farther, especially when touched on the footstalks, between the stems and the leaflets, which seem to be their most sensitive or irritable part. Now as their situation after being exposed to external violence resembles their sleep, but with a greater degree of collapse, may it not be owing to a numbness or paralysis consequent to too violent irritation, like the faintings of animals from pain or fatigue? A Sensitive Plant being kept in a dark room till some hours after day-break, its leaves and leaf-stalks were collapsed as in its most profound sleep; and on exposing it to the light, above twenty minutes passed before the plant was thoroughly awake, and had quite expanded itself. During the night, the upper or smoother surfaces of the leaves are appressed; this would seem to shew that the office of this surface of the leaf was to expose the fluids of the plant to the light as well as to the air." The same elegant author thus poetically characterizes this singular plant:

> "Weak with nice sense the chaste Mimosa stands,
> "From each rude touch withdraws her timid hands;
> "Oft as light clouds o'erpass the summer glade,
> "Alarm'd, she trembles at the moving shade;
> "And feels, alive through all her tender form,
> "The whisp'ring murmurs of the gath'ring storm;
> "Shuts her sweet eyelids to approaching night;
> "And hails with freshen'd charms the rising light."

The Sensitive and Humble Plants are all of them propagated by seeds, which should be sown early in the spring, upon a good hot-bed. If the seeds be good, the plants will appear in a fortnight or three weeks, when they will require to be treated with care, for they must not have much wet till they have acquired strength; nor should they be drawn too weak, so that fresh air should be admitted to them at all times when the air is temperate. In about a fortnight or three weeks after the plants come up, they will be fit to transplant, especially if the bed in which they were sown continues in a proper degree of heat; then there should be a fresh hot-bed prepared to receive them, which should be made a week before the plants are removed into it, that the violent heat may be abated before the earth be laid upon the dung, and the earth should have time to warm before the plants are planted into it. Then the plants must be carefully raised up from the bed to preserve the roots entire, and immediately planted in the new bed, at about three or four inches' distance, pressing the earth gently to their roots; then they should be gently sprinkled over with water, to settle the earth to their roots; after this they must be shaded from the sun till they have taken new root, and the glasses of the hot-bed should be covered every night to keep up the heat of the bed. When the plants are established in their new bed, they must have frequent but gentle waterings; and every day they must have free air admitted to them, in proportion to the warmth of the season, to prevent their being drawn up weak; but they must be constantly kept in a moderate degree of heat, otherwise they will not thrive. In about a month after, the plants will be strong enough to remove again, when they should be carefully taken up, preserving as much earth to their roots as possible, and each planted in a separate small pot, filled with good kitchen-garden earth, and plunged into a hot-bed of tan, carefully shading them from the sun till they have taken new root; then they must be treated in the same man-

ner as other tender exotic plants from very warm countries. Those sorts which grow upright and tall, will soon rise high enough to reach the glasses of the hot-bed, especially if they thrive well; therefore they should be shifted into larger pots, and removed into the stove, and if plunged into a the tan-bed there, it will greatly forward them. The perennials will live through the winter, if preserved in a warm stove, and in the following summer will produce flowers and ripen their seeds. Some of them may be propagated by laying down their branches, which will put out roots, and then may be separated from the old plants; and they may be increased by cuttings, but the plants which rise from seeds are greatly preferable. Some of those, the stalks of which spread near the ground, may be turned out of the pots in the middle of June, and planted in a very warm border, where, if covered with bell or hand glasses, they will live through the summer, but will not grow very large, and upon the approach of cold in the autumn are soon destroyed: however, those who have not conveniency of stoves or tan-beds, may raise the plants on common hot-beds in the spring, and, when they have acquired strength, they may be treated in this manner, whereby they will have the pleasure of these plants in summer, though not in so great perfection as those who have the advantages before mentioned: but these plants will not thrive in the open air in this country, nor will they retain their sensibility when they are fully exposed to the air.

***** *With doubly pinnate Leaves.*

27. Mimosa Scandens; *Climbing Mimosa.* Unarmed: leaves conjugate, terminated by a tendril; leaflets two-paired. This species climbs to the tops of the tallest trees, to the height of one hundred and fifty feet, frequently overspreading many of the neighbouring branches, and forming large arbours. It is called *Cocoon* in the West Indies.—Native of both Indies, and of Cochin-china.

28. Mimosa Plena; *Double-flowered Sensitive Plant.* Unarmed: leaves bipinnate; spikes five-stamined, the lower ones full or double.—This plant was discovered at Vera Cruz, growing in stagnant water, the stalks floating upon the water.

29. Mimosa Triquetra; *Three-sided Mimosa.* Unarmed, procumbent: leaves two-paired; heads roundish; stems compressed below, three-sided above. Stems slender, a foot high, simple, smooth, compressed at bottom, above striated, and three-sided.—Native of the East Indies.

30. Mimosa Natans; *Floating Mimosa.* Leaves bipinnate, two-paired or three-paired; leaflets thirteen-paired; heads oblong; stem flexuose, rooting at bottom. Stems herbaceous, angular, smooth, floating, putting out rooting fibres at the lower joints. Loureiro says that it is cultivated in Cochin-china for salads, being fastened to stakes in the water, that it may not float away, as it is entirely detached from the earth.

31. Mimosa Virgata; *Long-twigged Mimosa.* Unarmed, erect, angular: leaves bipinnate; spikes ten-stamined, the lower ones castrated males. Spike roundish, nodding; flowers yellow.—Native of the West Indies.

32. Mimosa Punctata; *Spotted-stalked Mimosa.* Unarmed: leaves bipinnate; spikes erect; flowers ten-stamined, lower ones castrated. It rises with upright branching stalks six or seven feet high. The small leaves, twenty pairs of which are ranged along the midrib of the lobes, contract themselves together on their being touched, but the footstalks do not incline at the same time, like those entitled Humble Plants. Browne calls it the Larger Smooth Sensitive, and says that it has been introduced into Jamaica from some other part of the world; probably from the continent of America. See the twenty-sixth species.

33. Mimosa Pernambucana; *Slothful Mimosa.* Unarmed: leaves bipinnate; spikes drooping, five-stamined, lower ones castrated; stem decumbent. This grows naturally in all the islands of the West Indies, where it is called the Slothful Sensitive Plant, because the leaves do not contract on being touched.

34. Mimosa Arborea; *Rough Tree-Mimosa.* Unarmed: leaves bipinnate; pinnas halved, acute; stem arboreous. This is a lofty tree, with an upright smooth trunk, covered with an ash-coloured bark. In Jamaica, where it is found in most parts of the island, it is called *Mountain* or *Wild Tamarind Tree;* it grows to a very considerable size, and is looked upon as an excellent timber wood.—Native of the West Indies, China, and Japan.

35. Mimosa Julibrissin; *Smooth Tree-Mimosa.* Arborescent: leaves bipinnate; pinnules cultriform, acuminate; all the flowers perfect. This is a tree, with a smooth ash-coloured bark; the branches as it were in whorls, tuberous at the base, nodding at the end.—Native of the Levant.

36. Mimosa Comosa; *Bearded Mimosa.* Unarmed, arboreous: leaves bipinnate, trijugous; pinnas (nine or ten paired,) ovate, retuse at the base; flowers panicled, monadelphous.—Native of Jamaica.

37. Mimosa Lebbeck. Unarmed: leaves bipinnate, quadrijugous; pinnas oval-oblong; flowers monadelphous, in bundles; stem arboreous.—Native of Upper Egypt.

38. Mimosa Odoratissima; *Sweet-scented Mimosa.* Unarmed: leaves bipinnate, quadrijugous, multijugous; leaflets oblong, blunt; panicles rod-like; spikelets globular. This is a lofty tree, with villose and somewhat hoary branches; flowers white, and very fragrant.—Native of Ceylon.

39. Mimosa Speciosa; *Bladder-sena-leaved Mimosa.* Unarmed: leaves bipinnate, subquadrijugous; pinnas generally nine-paired; leaflets oblong, smooth, a gland above the base of the rib. This is a very elegant tree, quite smooth all over; flowers numerous, very sweet, in a handsome head, at the top of which is one flower different from the rest, and abiding longer.

40. Mimosa Vaga. Unarmed: leaves bipinnate; outer pinnas larger, curved in, pubescent. This is a middle-sized tree, with spreading branches.—Native of the East Indies, Cochin-china, and Brasil.

41. Mimosa Corniculata. Unarmed, bipinnate: petioles swelling at the base, supported by a little callous horn; leaflets generally eight-paired.—Native of China, near Canton.

42. Mimosa Villosa. Unarmed: leaves bipinnate, generally five-paired; pinnas ovate, both they and the petioles villose; flowers globular, many-stamined; stem shrubby.—Native of the West Indies.

43. Mimosa Latisiliqua; *Broad-podded Mimosa.* Unarmed: leaves bipinnate; partial ones five-paired; branchlets flexuose; buds globular.—Native of the West Indies.

44. Mimosa Polystachia. Unarmed: leaves bipinnate; partial ones and pinnas six-paired, oblong. This plant, which becomes a tree itself, climbs up other trees, overtops them, and drags them down by its weight. The flowers are small, herbaceous, and so numerous that the compound spike sometimes contains 4500 of them.—Native of the West Indies; where it is a great nuisance to the sugar planters, by destroying the trees which they set to shelter their sugar grounds.

45. Mimosa Mangensis. Spines solitary, short; leaves bipinnate, generally nine-paired; spikes globular, axillary, solitary. Flowers white, void of scent.—Native of Jamaica, and other islands of the West Indies; found about Carthagena in New Spain, and frequent also in the island of Mango.

46. Mimosa Muricata; *Muricated Mimosa.* Unarmed:

leaves bipinnate; partial ones five-paired, proper ones many-paired; stem muricated.—Native of America.

47. Mimosa Juliflora. Spines stipulary, in pairs; leaves bipinnate, bijugous, distinguished by a gland; spikes pendulous; legumes compressed. This shrub rises frequently to the height of fifteen feet; is of a spreading growth, and furnished with oblong flower-spikes, and very long legumes. —It has been introduced into Jamaica from the Continent; and thrives very luxuriantly in many parts of the low lands.

48. Mimosa Peregrina. Unarmed; leaves bipinnate, partial ones sixteen-paired; pinnas forty-paired, with a petiolar gland at the base.—Native of America.

49. Mimosa Glauca; *Glaucous Mimosa.* Unarmed: leaves bipinnate, partial ones six-paired; pinnas very many, with a gland among the lowest. Flowers white, apetalous, ten-stamined.—Native of La Vera Cruz. The Acacias are propagated by sowing their seeds on a hot-bed, in the spring of the year; which will, in a short time, appear above ground, and in about five or six weeks afterwards be fit to transplant; when a fresh hot-bed is to be prepared for them, which should be pretty warm. The next thing to be provided, is a quantity of small halfpenny pots, which are to be filled with fresh, light, sandy earth; these should be plunged into the hot-bed, but not into dung; for if these beds be made with warm horse-dung, they ought to be covered with earth as deep as the pots, the bottoms of which should rest upon the dung; for otherwise, the roots of the plants may suffer by too much heat: but beds of tanner's earth seldom heat so violently. As soon as the earth in the pots is warm, which will be in two or three days, take up the young plants carefully out of the first hot-bed, setting four or five of them into each of these pots; giving them a gentle watering, to settle the earth to their roots; and screening them with mats over the glasses, from the heat of the sun, until they have taken root; after which, air must be admitted, by raising the glasses in proportion to the heat of the weather, or to the vigour of the plants. The horned Acacias are very often destitute of leaves for two or three months, appearing to have no life; but they will put out fresh leaves towards autumn, which is commonly the season when they are most vigorous. They should be exposed in the summer season for about two months, to clear them from insects, which greatly infest them, in a place defended from strong winds; and in the winter, they require a moderate degree of warmth. There are several of them that are very tender while young, but after two or three years' growth become hardy enough to bear the open air in summer: though hardly any of them will live through the winter in a green-house, unless they have some warmth in very cold weather.

50. Mimosa Pterocarpa; *Wing-fruited Mimosa.* Unarmed: leaves bipinnate, many-paired, a petiolar gland between the two outmost; spikes axillary; legumes winged.—Native of the Isle of France. See the preceding species.

51. Mimosa Grandiflora; *Great-flowered Mimosa.* Unarmed; leaves abruptly bipinnate, many-paired; pinnules many-paired; leaflets very distinct; raceme compound, terminating.—Native of the East Indies. See the forty-ninth species.

52. Mimosa Houstoni; *Houston's Mimosa.* Unarmed: leaves bipinnate, abrupt, commonly six-paired; pinnules many-paired; leaflets somewhat confluent; raceme compound, terminating. This is one of the most beautiful species of this genus: the petals being large, and of a fine purple colour; with their stamina stretched out to a considerable distance beyond the petals; the flowers make a charming appearance, when the tree is covered with them; and when the pods, which are ferruginous, are ripe, and hanging plentifully from every bough, the appearance is very pleasing from a small distance. —Native of La Vera Cruz. See the forty-ninth species.

53. Mimosa Cinerea; *Ash-coloured Mimosa.* Spines solitary; leaves bipinnate; flowers in spikes. Stem branched, even.—Native of the East Indies.

54. Mimosa Cornigera; *Horned Mimosa* or *Cuckold Tree.* Spines stipulary, connate, divaricating, compressed, awl-shaped at the tip; leaves bipinnate; leaflets from twelve to twenty paired; spikes axillary, elongated. This tree seldom exceeds twelve feet in height: it is singular for its writhed horn-like spines, which resemble the horns of oxen; they are brown, shining, hollow, and some of them more than five inches in length: they are all over the tree, and when the pods are ripe, and the leaves are fallen, they have a singular appearance.—It grows every where in the woods about Carthagena, in New Spain. See the forty-ninth species.

55. Mimosa Catechu; *Catechu Tree.* Spines stipulary; leaves bipinnate, many-paired; glands of the partial ones single; spikes axillary, in pairs or threes, peduncled. This is a small tree, about twelve feet high;—abounds in the mountains of Hindoostan, where it is a native. An Indian drug, long known by the name of Terra Japonica, and now more properly called Cate-chu, (from *cate* a tree, and *chu* juice,) is ascertained to be the produce of this tree. This extract, in its purest state, is a dry pulverable substance, outwardly reddish, inwardly shining dark brown, tinged with a reddish hue: to the taste, it discovers considerable astringency, succeeded by some sweetness. It dissolves wholly in water, except the impurities, which are usually sandy, and amount to about one-eighth of the mass. Rectified spirits dissolves about seven-eighths, into a deep red liquor. It may be usefully employed as an astringent, especially in alvine fluxes; also in uterine profluvia; in debility of the viscera, in general; and catarrhal affections. It is the basis of several formulæ; but the best way of taking it, is by an infusion in warm water, with cinnamon or cassia.

56. Mimosa Horrida; *Horrid Mimosa.* Spines stipulary, the length of the leaves; leaves bipinnate, partial ones six-paired, branches even. Branches angular and smooth, with a brown bark.—Native of Both Indies and Arabia.

57. Mimosa Fera; *Fierce Mimosa.* Spines branched; leaves pinnate; flowers in spikes. This is a large tree, with spreading branches.—Native of China and Cochin-china; where it is planted for hedges, which are impenetrable by animals.

58. Mimosa Eburnea; *Ivory-thorned Mimosa.* Spines stipulary, connate, divaricating, round, awl-shaped; leaves bipinnate; leaflets six-paired; spikes globular, peduncled, axillary, several. This small tree is remarkable for its tremendous spines, two inches long, at the ends of the branches. —Native of the East Indies.

59. Mimosa Latronum; *Rogues' Mimosa.* Spines stipulary, connate, divaricating, round, awl-shaped; leaves bipinnate; leaflets four-paired; spikes elongated, peduncled, axillary, commonly in pairs. This is a very thorny branching depressed shrub.—Native of the East Indies. These thorny Mimosas, with their interwoven branches, and terrible spines, form impenetrable thickets in the mountainous parts of India, and are the secure retreat of smaller animals, birds, and rogues; from whom this species has obtained its name.

60. Mimosa Filicioides; *Fern-like Mimosa.* Unarmed: leaves bipinnate, partial ones six-paired; leaflets very numerous, very small, ciliate, without glands. Stem shrubby, branched, three feet high.—Native of Mexico.

61. Mimosa Tortuosa; *Writhed Mimosa.* Spines stipulary; leaves bipinnate, four-paired, a gland between the lowest; pinnas sixteen-paired; spikes globular. This is a shrub with a branching stem: between the outer coat of the pod and the inner membrane, separating the seeds, there is a liquor of the consistence and colour of a syrup, which smells very strong, and is bitter and astringent. Browne says, that it would prove an excellent medicine, where rough astringents are requisite. The whole plant is bitter; and the flowers have a very strong smell; indeed, the smell of all the parts is so rank and disagreeable, that it cannot be used even for firewood, and is chiefly employed in hedges.—Native of Jamaica, where it is common in the low lands; and is called the Common Acacia, or Acacee Bush.

62. Mimosa Farnesiana; *Farnesian Mimosa,* or *Sponge Tree.* Spines stipulary, distinct; leaves bipinnate, partial ones eight-paired; spikes globular, sessile. This species is known throughout Europe for the sweetness of its flowers; and the Italian gardeners, who bring over Orange-trees, &c. to England, bring also many young plants of this, under the name of *Gazia.*—Native of the West Indies, Barbary, and Egypt, and of Cochin-china, in a state of cultivation. This beautiful tree is very tender while young; therefore should have a hot-bed of tanner's bark; and as it increases in bulk, should be shifted into bigger pots. The earth should be light, and inclined to a sand. It should never be planted in over large pots; nor have too much water, especially in winter. This species is hardy, and will, when grown to be woody, stand in a common stove, which should be kept to the point of temperate heat, in winter; and in the warm weather, in summer time, may enjoy the open free air.

63. Mimosa Nilotica; *Egyptian Mimosa.* Spines stipulary, spreading; leaves bipinnate, the outer partial ones separated by a gland; spikes globular, peduncled. This tree grows to a large size in its native country, but in England is rarely more than eight or ten feet high.—Native of Egypt and Arabia. This is the tree that yields the Gum Arabic, which is brought from Suez. The medical character of Gum Arabic, is its glutinous quality: in consequence of which, it proves useful in tickling coughs, hoarsenesses, in dysenteries attended with griping, and where the mucus is abraded from the bowels or from the urethra. In a dysuria, the true Gum Arabic should be preferred before any other of the vegetable gums: one ounce renders a pint of water considerably glutinous; four ounces give it a syrupy consistence: but for mucilage, one part gum to two parts water is required; and for some purposes, an equal proportion will be necessary.

64. Mimosa Stellata; *Starry Mimosa.* Spines stipulary; leaves bipinnate; petioles having recurved prickles underneath; flowers racemed.—Native of Arabia.

65. Mimosa Pigra. Prickly, even: leaves bipinnate, with opposite prickles; spine erect between each of the partial ones.—Native of South America.

66. Mimosa Asperata; *Hairy-podded Sensitive Plant.* Prickly, rough-haired: leaves bipinnate, with opposite prickles; spine erect, between each of the partial ones. Stalk shrubby, erect, five feet high, hairy, and armed with short broad strong thorns; flowers in globular heads, purple. —Native of Vera Cruz. See the twenty-sixth species.

67. Mimosa Senegal; *African Mimosa.* Spines in threes, the middle one reflex; leaves bipinnate; flowers in spikes. This is distinguished at first sight by its white bark.—Native of Africa.

68. Mimosa Cæsia; *Gray Mimosa.* Prickly: leaves bipinnate; pinnas oval-oblong, obliquely acuminate.—Native of the East Indies. See the forty-ninth species.

69. Mimosa Pinnata; *Small-leaved Mimosa.* Prickly: leaves bipinnate, very numerous, linear, acerose; panicle prickly; heads globular.—Native of the East Indies and of Cochin-china; where the bark is converted into a sort of tow, used for caulking boats, and stopping cracks in houses.

70. Mimosa Intsia; *Angular-stalked Mimosa.* Prickly: leaves bipinnate; pinnas curved inwards; stem angular; stipules longer than the prickle. Branches obtuse-angled, even. —Native of the East Indies.

71. Mimosa Semispinosa. Prickly: leaves bipinnate; joints of the stem prickly above.—Native of America.

72. Mimosa Quadrivalvis. Prickly: leaves bipinnate; stem quadrangular, with recurved prickles; legumes four-valved. This has a creeping root: stalks slender, having four acute angles, armed pretty closely with short recurved spines: leaves on long prickly footstalks, and thinly placed on the branches.—Native of La Vera Cruz.

73. Mimosa Tenuifolia. Prickly: leaves bipinnate, partial ones twenty paired; pinnas many-paired.—Native of South America.

74. Mimosa Ceratonia. Prickly: leaves pinnate, five-paired; partial ones three-paired: pinnas three-nerved.— Native of South America.

75. Mimosa Tamarindifolia. Prickly: leaves bipinnate, five-paired; partial ones ten-paired; petioles unarmed.— Native of America.

76. Mimosa Sinuata. Prickly: leaves bipinnate, many-paired; heads axillary, solitary; legumes sinuate; stem climbing.—Native of Cochin-china, in woods.

77. Mimosa Saponaria; *Soap Mimosa.* Unarmed: leaves bigeminate and pinnate, leaflets ovate, acuminate, petioled; panicle terminating. This is an arboreous shrub, with spreading unarmed branches. The bark yields excellent soap.— Native of Cochin-china, in woods.

78. Mimosa Lutea; *Yellow Mimosa.* Prickly: leaves bipinnate, smooth; flowers globular, peduncled; prickles very long.—Native of South America.

79. Mimosa Angustissima; *Narrow-leaved Mimosa.* Unarmed: leaves bipinnate; pinnas very narrow, smooth; legumes swelling.—Native of South America.

80. Mimosa Campeachiana; *Split-horned Mimosa.* Thorny: leaves bipinnate; pinnas narrow, with thorns like an ox's horn split lengthwise. This is one of the most singular species yet known; the spines being spread open and flat, appearing as if split lengthwise. The leaves are very beautiful; but the flowers being small and of an herbaceous colour, make no great appearance. In the natural place of its growth, this tree produces flowers almost through the year; and a succession of pods is generally found on it: but the seeds are commonly eaten by insects, before they come to maturity.— Native of South America.

81. Mimosa Mierophylla; *Prickly Red Mimosa.* Prickly all over: leaves bipinnate, eight-paired; leaflets sixteen-paired; heads axillary, peduncled, solitary, or in pairs.— Native of Georgia and Carolina.

82. Mimosa Nitida; *Shining Mimosa.* Thorny: leaves bipinnate, two-paired, a gland between each; leaflets five-paired; spikes globular, peduncled. Branches round, purple, flexnose, pubescent.—Native of the East Indies.

83. Mimosa Umbellata; *Umbelled Mimosa.* Thorny: leaves conjugate and bipinnate, two-paired; flowers umbelled; legumes spiral. This tree has round, smooth, dotted branches. —Native of Ceylon.

84. Mimosa Proceros; *Large Mimosa.* Trunk straight; head very large and dense; leaves alternate, twice feathered, twelve to eighteen inches long; panicles terminal and axillary,

composed of globular heads of yellow fragrant corollets. It is the largest of its species known in India; and is the *pedda patseroo* of the Telingas.—Native of the mountainous parts of the coast of Coromandel.

85. Mimosa Asak; *Purple Mimosa.* Spines in threes, straight; leaves bipinnate, three-paired; proper five-paired, a gland between the lowest pair of the partial ones. Branches purple, smooth, flexuose.—Native of Arabia.

Mimulus; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, oblong, prismatic, five-cornered, five-folded, five-toothed, equal, permanent. *Corolla:* one-petalled, ringent; tube the length of the calix; border two-lipped; upper lip upright, bifid, rounded, bent back at the sides; lower lip wider, trifid, with the segments rounded, the middle one smaller; palate convex, bifid, protruded from the base of the lip. *Stamina:* filamenta four, filiform, within the throat, two shorter; antheræ bifid, kidney-form. *Pistil:* germen conical; style filiform, the length of the stamina; stigma ovate, bifid, compressed. *Pericarp:* capsule oval, two-celled, opening transversely at top; partition membranaceous, contrary to the valves. *Seeds:* very many, small. *Receptacle:* oblong, fastened on each side to the partition. Essential Character. *Calix:* four-toothed, prismatical. *Corolla:* ringent; the upper lip folded back at the sides. *Capsule:* two-celled, many-seeded.——The species are,

1. Mimulus Ringens; *Oblong-leaved Monkey-flower.* Erect: leaves oblong, linear, sessile. Root perennial; stalk annual, square, a foot and half high. It flowers in July and August. —Native of Virginia and Canada. This plant is very hardy in respect to cold, but should have a loamy soft soil, rather moist than dry, and not too much exposed to the sun. It may be increased by parting the roots in autumn; but they should not be divided too small. It may also be propagated by seeds sown in autumn, soon after they are ripe; for those which are sown in the spring seldom grow the same year: they should be sown on a border exposed to a morning sun.

2. Mimulus Luteus; *Ovate-leaved Monkey-flower.* Creeping: leaves ovate, on short stalks embracing the stem; flowers on solitary stalks, two at each joint, of a bright yellow colour, their throat spotted with red. This plant is supposed to be hardy, and of easy propagation, and will probably soon become common, as it is the most beautiful species of the genus, being large and magnificent, thickly set with foliage and flowers.—Native of Peru, &c.

3. Mimulus Alatus; *Wing-stalked Monkey-flower.* Erect: leaves ovate, petioled; stems square-winged. This has the resemblance of the first species.—Native of America.

4. Mimulus Aurantiacus; *Orange Monkey-flower.* Stem erect, shrubby, round; leaves ovate-lanceolate, bluntish. Stalk about three feet high, much branched, shrubby.—It is propagated by cuttings.

5. Mimulus Lewisii. Plant erect, small, pubescent; leaves sessile, oblong-lanceolate, acute, nervous, mucronate-denticulate; flowers few, terminal, with very long footstalks; teeth of the calix acuminate. The flowers are of a very beautiful pale purple.—It grows on the head springs of the Missouri, at the foot of Portage hill, and is seldom above eight inches high.

Mimusops; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth eight-leaved, coriaceous; leaflets in a double row, ovate, acute, permanent. *Corolla:* petals eight, lanceolate, spreading, the length of the calix. *Stamina:* filamenta eight, awl-shaped, hairy, very short; antheræ oblong, erect, the length of the calix. *Pistil:* germen superior, round, hispid; style cylindric, the length of the corolla; stigma simple. *Pericarp:* drupe oval, acuminate: (Berry one-celled, according to Gærtner.) *Seeds:* single, or two? oval, hard, shining. Essential Character. *Calix:* four-leaved; Gærtner says, eight-parted. *Petals:* four; Linneus says eight, and Gærtner many. *Nectary:* sixteen-leaved. *Drupe:* acuminate. *Or thus,* from Jussieu—*Calix:* eight-parted, in two rows. *Corolla:* eight-parted, with the segments entire, or three-parted; appendices eight, small, like scales. *Drupe:* with one or two seeds.——The species are,

1. Mimusops Elengi. Leaves alternate, remote, lanceolate, acuminate. This is a middle-sized tree.—Native of the East Indies, where it is much planted on account of its fragrant flowers, which come out chiefly in the hot season.

2. Mimusops Kauki. Leaves clustered, ovate, obtuse, silvery beneath.—Native of the East Indies and Arabia.

3. Mimusops Hexandra. Leaves alternate, obovate, emarginate. This is a large tree, with an erect trunk, and covered with an ash-coloured bark; when old, it has frequently large rotten excavations. The wood being remarkably heavy, is much used by the washerwomen in the East Indies to beetle their cloth on.—Native of the East Indies, in the mountainous uncultivated parts of the Circars.

Mint. See *Mentha.*

Minuartia; a genus of the class Triandria, order Trigynia. —Generic Character. *Calix:* perianth five-leaved, upright, long; leaflets awl-shaped, somewhat rigid, permanent. *Corolla:* none. *Stamina:* filamenta three, capillary, short; antheræ roundish. *Pistil:* germen three-cornered; styles three, short, filiform; stigmas thickish. *Pericarp:* capsule oblong, triangular, much shorter than the calix, one-celled, three-valved. *Seeds:* not numerous, roundish, compressed. Essential Character. *Calix:* five-leaved. *Corolla:* none. *Capsule:* one-celled, three-valved. *Seeds:* few.——The species are,

1. Minuartia Dichotoma. Flowers clustered, dichotomous. This is a rigid, hard, tough, little annual plant: flowers sessile in cymes, forming a square head.—Native of Spain.

2. Minuartia Campestris. Flowers terminating, alternate, longer than the bracte.—Native of Spain, where it is found in the lower hills.

3. Minuartia Montana. Flowers lateral, alternate, shorter than the bracte. Stems several, diffused, a finger's length, pubescent, and hoary.—Native of Spain.

Mirabilis; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth outer one-leafed, erect-ventricose, inferior, five-parted; segments ovate-lanceolate, sharp, unequal, permanent; inner globular, placed under the petal, with a contracted entire mouth, and permanent. *Corolla:* one-petalled, funnel-form; tube slender, long, thicker at top, placed on the inner calix; border from upright spreading, entire, bluntly five-cleft, plaited; nectary spherical, fleshy, surrounding the germen, with a five-toothed mouth; teeth very small, triangular, converging. *Stamina:* filamenta five, inserted into the orifice of the nectary, and alternate with its teeth, within the inner calix free, more slender, fastened at bottom to the tube of the corolla, filiform, the length of the corolla, inclining, unequal; antheræ twin, roundish, rising. *Pistil:* germen turbinate, within the nectary; style filiform, the length and situation of the stamina; stigma globular, dotted, rising. *Pericarp:* none. The inner calix incrusts the seed, and falls with it. *Seed:* single, ovate, five-cornered. Essential Character. *Calix:* inferior. *Corolla:* funnel-form, superior. *Nectary:* globular, inclosing the germen.——The species are,

1. Mirabilis Jalapa; *Common Marvel of Peru.* Flowers heaped, terminating, erect; root tuberous; stem herbaceous, round, often trichotomous. This is a perennial plant, and the

roots in their native country grow to a great size. There are many varieties in the colour of the flowers, such as purple or red, white, yellow, variegated purple and white, and variegated purple and yellow. These however resolve themselves into two principal varieties; purple-flowered, and yellow-flowered: The first of which has purple and white flowers, which are variable; some are plain purple, others plain white, but most of them are variegated with the two colours, and all are sometimes found upon the same plant. The second has red and yellow flowers, generally mixed, but sometimes distinct on the same plants; some plants have only plain yellow flowers, others only are variegated, and others again both plain and variegated: but plants raised from the seeds of the purple and white never produce red and yellow flowers, nor the contrary. These varieties are very ornamental plants in a flower-garden, during the months of July, August, and September; and if the season should continue mild, they often last till near the end of October. The flowers do not open till towards the evening, whilst the weather continues warm; but in moderate cool weather, while the sun is obscured, they continue open almost the whole day. They are produced so plentifully at the ends of the branches, that when they are expanded, the plants seem entire covered with them; and some being plain, others variegated, on the same plant, they make a fine appearance. —Native of the East and West Indias, China, Cochin-china, and Africa; but was introduced into Europe first from Peru. Thunberg informs us, that the Japanese ladies make a white paint from the meal of the seeds of this plant, to improve their complexions.—*Propagation and culture.* Sow the seeds on a moderate hot-bed, in March. When the plants come up, admit plenty of air to them, when the weather is mild: when they are two inches high, transplant them on another very moderate hot-bed; or plant each in a small pot filled with light earth, and plunged into a hot-bed; whence they may be shaken out into the borders with more security. When they are in the second hot-bed, let them be shaded till they have taken fresh root; after which, they must have plenty of free air; and in May, should be gradually inured to the open air. In the beginning of June, if the season be favourable, transplant them into the borders of the pleasure-garden, giving them proper room; and after they have taken new root, they will require no further care. If the seeds be sown in a warm border, at the beginning of April, they will grow very well; but the plants will be late in the season before they flower. As the seeds ripen very well, there are not many persons who are at the trouble of preserving the roots: if these, however, be taken out of the ground in autumn, and laid in dry sand all the winter, secured from frost, and planted again in the spring, they will grow much larger, and flower earlier, than the seedling plants: or if the roots be covered with tanner's bark in winter, to keep out the frost, they may remain in the borders, if the soil be dry. If the roots, which are taken out of the ground, be planted the following spring, in large pots, and plunged into a hot-bed, under a deep frame, they may be brought forward, and raised to the height of four or five feet; and come earlier in the season to flower. In the choice of seeds, care should be taken not to save any from the plants with plain flowers; and in order to have variegated flowers, the plain flowers should be pulled off.

2. Mirabilis Dichotoma; *Forked Marvel of Peru.* Flowers sessile, axillary, erect, solitary.—It is a native of Mexico; but is very common in all the islands of the West Indies, where the inhabitants call it the Four-o'clock Flower, from the flowers opening at that time of the day. This is not quite so hardy as the first species; so that unless the plants be brought forward in the spring, they will not flower till very late.

3. Mirabilis Longiflora; *Sweet-scented Marvel of Peru.* Flowers heaped, very long, somewhat nodding, terminating; leaves subvillose. The stalks of this sort fall on the ground, if not supported; the flowers come out at the ends of the branches, are white, have very long slender tubes, and a faint musky odour: as in the other species, they are shut during the day, and expand as the sun declines. It flowers from June to September.—Native of Mexico.

4. Mirabilis Viscosa; *Clammy Marvel of Peru.* Flowers racemed; leaves cordate, orbiculate, acute, tomentose. Stems thick, round, swelling at the joints, with opposite branches, three or four feet high.—Native of Peru

Misseltoe. See *Viscum.*

Mitchella; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* flowers two, sitting on the same germen; perianths two, distinct, four-toothed, erect, permanent, superior. *Corolla:* one-petalled, funnel-form; tube cylindric; border four-parted, spreading, hirsute within. *Stamina:* filamenta four, filiform, erect, within the sinuses of the corolla; antheræ oblong, acute. *Pistil:* germen twin, orbiculate, common to two, inferior; style filiform, the length of the corolla; stigmas four, oblong. *Pericarp:* berry two-parted, globular, with separate navels. *Seeds:* four, compressed, callous. Essential Character. *Corollas:* one-petalled, superior, two on the same germen. *Stigmas:* four. *Berry:* bifid, four-seeded.——The only known species is,

1. Mitchella Repens; *Creeping Mitchella.*—Native of Carolina, Maryland, and Virginia.

Mitella; a genus of the class Decandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, half five-cleft, bell-shaped, permanent. *Corolla:* petals five, multifid, capillary, twice as large as the calix, and inserted into it. *Stamina:* filamenta ten, awl-shaped, inserted into the calix, shorter than the corolla; antheræ roundish. *Pistil:* germen roundish, bifid; styles scarcely any; stigmas blunt. *Pericarp:* capsule ovate, one-celled, half two-valved; valves flat, rolled back at top, equal. *Seeds:* very many. Essential Character. *Calix:* five-cleft. *Corolla:* five-petalled, inserted into the calix; petals pinnatifid. *Capsule:* one-celled, two-valved; valves equal.—These plants are increased by parting the roots in autumn: they love shade, and a soft loamy soil.——The species are,

1. Mitella Diphylla; *Two-leaved Mitella.* Scape two-leaved. Root perennial; stalks eight or nine inches high, and are terminated by a loose spike of small whitish flowers, the petals of which are fringed on their edges.—Native of most parts of North America, in woods.

2. Mitella Nuda; *Naked Mitella.* Leaves kidney-shaped; scape naked.—Native of Siberia and North America.

3. Mitella Cordifolia. Leaves orbiculate, reniform, subduplicate, crenate, lucid; scape setaceous, aphyllous.—It flowers in May and June; and is found in Canada, and on the high mountains of New York and Pennsylvania.

4. Mitella Prostrata. Root creeping; stalks prostrate; leaves alternate, rotund-cordate, subacute, obtusely sublobate. It flowers in May and June.—Found in the most southern parts of Canada; and growing also upon the mountains of Virginia, near the sweet springs.

5. Mitella Grandiflora. Plant very rough; leaves rotund-cordate, obtusely lobate, dentate; flowers pedicellated; calices campanulate.—Found on the north-west coast of America. The flowers are more than four times the size of the other species.

Mithridatea; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* receptacle common

one-leafed, fleshy, bell-shaped, four-cleft; clefts large, ovate, spreading, covered above with very numerous, immersed, very small florets; perianth proper, scarcely any. *Corolla:* none. *Stamina:* filamenta one, very short, upright; antheræ erect, channelled, embracing the style. *Pistil:* germen inferior; style shorter than the stamina, within the excavation of the antheræ; stigma simple. *Pericarp:* none: common receptacle enlarged, more fleshy; the segments converging, turbinate, hollow in the middle, containing the seeds within its substance. *Seeds:* solitary, ovate. *Observe.* According to Jussieu, the flowers are monœcous. The male has the involucre at first ovate, converging, entire; afterwards four-parted, spreading, covered on the inside with very numerous antheræ: and the female has the involucre ovate, hollow within, pervious at the navel at top. ESSENTIAL CHARACTER. *Calix:* common four-cleft, enlarged, fleshy, containing the seeds. *Corolla:* none. *Fruit:* globular, depressed. *Seeds:* solitary, arilled.——The only known species is,

1. Mithridatea Quadrifida; *Drum-tree*, or *Monkey-apple.* Leaves subopposite, entire, evergreen; flowers in racemes, very seldom, solitary, growing on the trunk and lower branches; females fewer, mixed with the males. It is a milky tree, with branches opposite. The fruit is fleshy, about the size of an apple.—Native of the islands of Madagascar, Mauritius, and Bourbon. *Ambora* is the Madagascar name of this tree.

Mithridate, Mustard. See *Thlaspi*, and *Biscutella.*

Mnasium; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* spathe two-valved; valves ovate, terminated by a linear patulous leaflet; perianth one-leafed, three-parted; segments lanceolate, concave, acute, margined. *Corolla:* one-petalled; tube very short; border three-parted; parts lanceolate, concave, acute. *Stamina:* filamenta six, very short, inserted into the tube; antheræ long, four-cornered, terminated by an ovate, excavated acute leaflet. *Pistil:* germen three-lobed; style long, striated; stigmas three, rolled spirally. ESSENTIAL CHARACTER. *Calix:* one-leafed, three-parted. *Corolla:* one-petalled, three-parted, with a very short tube. *Antheræ:* four-cornered, terminated by an ovate leaflet. *Germen:* three-lobed. *Stigmas:* three, spiral.——The only known species is,

1. Mnasium Paludosum. This is a perennial plant, with a fibrose woody root; the leaves are very long, narrow, sharp, and smooth, striated, perfectly entire, sheathing at the base, and mutually embracing each other, and are narrowed above the sheath; the stalks are several, naked, two feet high, striated, compressed, margined; corolla yellow.—Native of Guiana; growing in marshy woods.

Mniarum; a genus of the class Monandria, order Digynia.—GENERIC CHARACTER. *Calix:* involucre four-leaved, two-flowered; leaflets ovate, acute; the two lowest united; perianth one-leafed, four-cleft. *Corolla:* none. *Stamina:* filamenta one, (Solander says two,) capillary, erect, scarcely longer than the calix, and inserted into the base of it; antheræ roundish, grooved. *Pistil:* germen inferior, oval, scarcely angular, hard, longer than the calix; styles two, filiform, gradually divaricating, the length of the calix; stigmas simple. *Pericarp:* none. *Seed:* one, oblong, very small, inclosed in the hardened bottom of the calix. ESSENTIAL CHARACTER. *Calix:* four-parted, superior. *Corolla:* none. *Seed:* one.——The species are,

1. Mniarum Biflorum. Stems tufted; branches very smooth; leaves finely toothed at the base only, shorter than the fruit-stalks. This plant resembles Minuartia so much in its appearance, that, without examining the flower, it would be ranked with that genus. It is very smooth, dichotomous, covered all over with approximating, acerose, connate flowers, terminating in pairs, subsessile, generally shorter than the leaves.—Native of New Zealand and Terra del Fuego.

2. Mniarum Fasciculatum. Stems procumbent, branched; branches minutely downy; leaves finely toothed throughout; fruit-stalks hardly as long as the leaves.—Found in Van Diemen's Land.

Mnium; a genus of the class Cryptogamia, order Musci.—ESSENTIAL GENERIC CHARACTER. *Capsule:* with a lid. *Calyptre:* smooth; bristle from a terminating tuberele. *Male Flowers:* headed or discoid.—*Or thus*, from Withering. *Capsule:* with a veil. *Fringe:* with sixteen teeth; sometimes, though rarely, with four. *Male.* Bud circular, rarely knob-like, mostly on a separate plant.—Withering has enumerated twenty-four species, besides many varieties. Of all these, the most remarkable is Mnium Hygrometricum. If the fruit-stalks be moistened at the bottom, the head makes three or four turns; and if the head be moistened, it turns the contrary way.

Moehringia; a genus of the class Octandria, order Digynia.—GENERIC CHARACTER. *Calix:* perianth four-leaved; leaflets lanceolate, spreading, permanent. *Corolla:* petals four, ovate, undivided, spreading, shorter than the calix. *Stamina:* filamenta eight, capillary; antheræ simple. *Pistil:* germen globular; styles two, erect, the length of the stamina; stigmas simple. *Pericarp:* capsule subglobular, one-celled, four-valved. *Seeds:* very many, roundish, convex on one side, angular on the other. ESSENTIAL CHARACTER. *Calix:* four-leaved. *Petals:* four. *Capsule:* one-celled, four-valved.——The only known species is,

1. Moehringia Muscosa. Root annual, slender; stems filiform, eight, ten, or twelve inches long, upright, very much branched; flowers axillary, erect, on slender one-flowered peduncles: petals narrow, milk-white.—Native of the mountains of France, Austria, Silesia, &c. among moss on rocks, by the trunks of trees, or springs or little rills of water.

Mogorin; a name given by the Portuguese to an Indian or Chinese flower, which grows upon a small shrub. It is of a wonderfully white colour, and not unlike the *Ginseng*, only that it abounds more with leaves, and smells much sweeter, one single flower filling a whole house with its odoriferous effluvia. On this account the Chinese value it highly, and carefully defend the shrub it grows upon from the inclemency of the winter, by covering it with vases provided on purpose.

Mollugo; a genus of the class Triandria, order Trigynia.—GENERIC CHARACTER. *Calix:* perianth five-leaved; leaflets oblong, from upright spreading, coloured within, permanent. *Corolla:* none. *Stamina:* filamenta three, bristle-shaped, shorter than the corolla, approximating to the pistil; antheræ simple. *Pistil:* germen superior, ovate, three-grooved; styles three, very short; stigmas blunt: or, according to Gærtner, style one, trifid at top. *Pericarp:* capsule ovate, three-celled, three-valved. *Seeds:* numerous, kidney-form. ESSENTIAL CHARACTER. *Calix:* five-leaved. *Corolla:* none. *Capsule:* three-celled, three-valved.—To propagate these plants, permit them to scatter their seeds, and they will sometimes come up in the following spring; but if sown upon a hot-bed, they will come up more certainly, and be forwarder and stronger.——The species are,

1. Mollugo Oppositifolia: *Opposite-leaved Mollugo.* Leaves opposite, lanceolate; branches alternate; peduncles lateral, clustered, one-flowered. Annual.—Native of Ceylon.

2. Mollugo Strieta; *Upright Mollugo.* Leaves commonly in fours, lanceolate; flowers panicled, nodding; stem erect, angular. Root fibrous; stems three or four, stiff, even; leaves in whorls; flowers white.—Native of Africa, Ceylon, &c.

3. Mollugo Hirta; *Hairy Mollugo.* Leaves in fours, obovate, villose; stem decumbent.—Native of the Cape.

4. Mollugo Pentaphylla; *Five-leaved Mollugo.* Leaves in fives, obovate, equal; flowers panicled, white; root-leaves oblong; stem decumbent.—Native of Ceylon.

5. Mollugo Verticillata; *Whorl-leaved Mollugo.* Leaves in whorls, wedge-form, acute; stem subdivided, decumbent; peduncles one-flowered. This is a trailing plant, spreading out seven or eight inches every way, with six or seven small leaves at each joint. Native of Virginia and Jamaica, where it is pretty common in the dry savannas of Liguanee.

6. Mollugo Triphylla; *Three-leaved Mollugo.* Leaves in threes, lanceolate; flowers dichotomous. Stem herbaceous, annual.—Native of China, near Canton.

Molucca Balm. See *Moluccella.*

Molucca Bean. See *Guilandina.*

Moluccella; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, very large, turbinate, gradually finishing in a very wide, bell-shaped, tooth-spiny, incurved, permanent border. *Corolla:* one-petalled, ringent, less than the calix; tube and throat short; upper lip upright, concave, entire; lower lip trifid; the middle segment more produced, emarginate. *Stamina:* filamenta four, under the upper lip, of which two are shorter; antheræ simple. *Pistil:* germen four-parted; style the size and situation of the stamina; stigma bifid. *Pericarp:* none; fruit turbinate, truncate, in the bottom of the open calix. *Seeds:* four, convex on one side, angular on the other, at top wide and truncate. Essential Character. *Calix:* bell-shaped, widening, broader than the corolla, spiny.—The species are six, among which are the following:

1. Moluccella Lævis; *Smooth Molucca Balm.* Calices bell-shaped, commonly five-toothed; toothlets equal. Root annual; stem three feet high, spreading out into many branches, which are smooth, and come out by pairs.—Native of Syria. This and the next species are annuals, which decay soon after the seeds are ripe, and being natives of warm countries, seldom perfect their seeds in England when they are sown in the spring. They should be raised therefore in autumn, and planted in small pots, placed under a hot-bed frame in winter, where they may have free air in mild weather, by taking off the glasses; but they must be covered in frosty weather, observing to keep them pretty dry, otherwise they are very subject to rot. In the spring the plants may be turned out of the pots, with all the earth about their roots, and planted in a warm border, defended from strong winds, giving them a little water to settle the earth to their roots; after this, they will require no other care but to keep them clean from weeds, and to support them with stakes to prevent their being broken by the winds. The plants thus preserved through the winter, will flower at the end of June, and good seeds may be expected from them.

2. Moluccella Spinosa; *Prickly Molucca Balm.* Calices ringent, eight-toothed; root annual; stems smooth, purplish, four feet high, branching out in the same manner with the first.—Native of the Levant: it is commonly said to be a native of the Molucca Islands.

3. Moluccella Frutescens; *Shrubby Molucca Balm.* Calices funnel-form, five-cleft; corollas longer than the calix. This is a small shrub, with dichotomous branchlets.—Native of Persia, whence it has migrated into Italy: it has also been observed in Piedmont.

Moly. See *Allium.*

Momordica; a genus of the class Monœcia, order Syngenesia.—Generic Character. *Male Flowers. Calix:* perianth one-leafed, concave, five-cleft; segments lanceolate, spreading. *Corolla:* five-parted, fastened to the calix, more spreading, large, veined, wrinkled. *Stamina:* filamenta three, awl-shaped, short; antheræ on two filaments, bifid, eared at the sides; on the third simple, one-eared only, consisting of a compressed body, and a fariniferous line once reflex. *Female Flowers:* on the same plant. *Calix:* perianth as in the male, superior, deciduous. *Corolla;* as in the male. *Stamina:* filamenta three, very short, without antheræ. *Pistil:* germen inferior, large; style single, round, trifid, columnar; stigmas three, gibbous, oblong, pointing outwards. *Pericarp:* pome dry, oblong, opening elastically, three-celled; cells membranaceous, soft, distant. *Seeds:* several, compressed. Essential Character. *Calix:* five-cleft. *Corolla:* five-parted. *Male.* Filamenta three. *Female.* Style trifid. Pome: opening elastically.——The species are,

1. Momordica Balsamina; *Common Momordica,* or *Male Balsam Apple.* Pomes angular, tubercled; leaves smooth, spreading, palmate. Stems trailing like those of the Cucumber and Melon, extending three or four feet in length, and sending out many side-branches, which have tendrils. This plant is famous in Syria for curing wounds. They cut open the unripe fruit, and infuse it in sweet oil, exposed to the sun for some days, until the oil is become red. This oil, dropped on cotton, is applied to a fresh wound, and is esteemed by the Syrians next to Balsam of Mecca. The leaves and stems are also used for arbours or bowers.—To propagate this and the six following species, sow the seeds on a hot-bed at the beginning of March; and when the plants come up, prick them into a fresh hot-bed, letting them have fresh air in warm weather, and refreshing them frequently with water. When the plants have four or five leaves, plant them out into the hot-bed where they are to remain, putting one or two plants into each light; watering and shading them until they have taken root. After this, treat them as Melons or Cucumbers, permitting their branches to extend in the same manner, and keeping them clean from weeds. With this management, if they have not too much wet, and are not too much exposed to the open air, they will produce fruit in July, and the seeds will ripen in August and September; when it must be gathered as soon as it opens, otherwise the seeds will be cast abroad, and with difficulty gathered up again.

2. Momordica Charantia: *Hairy Momordica.* Pomes angular, tubercled; leaves villose, longitudinally palmate. Stem round, slender, branched, climbing by lateral tendrils.—Native of the East Indies. See the preceding species.

3. Momordica Operculata; *Lidded Momordica.* Pomes angular-tubercled, having a lid from the falling of the top; leaves lobed.—Native of America.

4. Momordica Luffa; *Egyptian Momordica.* Pomes oblong; grooves like a chain; leaves gashed. Stem angular, very much branched, climbing by bifid spiral tendrils. The fruit when young is made into a pickle, like the Mango, but it has a disagreeable taste, and is not accounted very wholesome. The Arabians call this plant *Liff* or *Luff;* they cultivate it, and it climbs up the Palm-trees, covering and elegantly adorning their trunks. It is also largely cultivated in China and Cochin-china.—Native of the East Indies.

5. Momordica Cylindrica; *Long-fruited Momordica.* Pomes cylindric, very long; leaves with acute angles. Stem five-angled. Native of Ceylon and China.

6. Momordica Trifolia; *Three-leaved Momordica.* Pomes ovate, muricate; leaves ternate, toothed.—Native of the East Indies.

7. Momordica Pedata; *Pedate-leaved Momordica.* Pomes striated; leaves pedate, serrate.—Native of Peru.

8. Momordica Elaterium; *Elastic Momordica.* Pomes hispid; tendrils none. It has a large, fleshy, perennial root, somewhat like that of Bryony; stems thick, rough, trailing,

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MIMULUS LEWISII.

MONARDA – *Scarlet Monarda, or Oswego Tea.*

MESEMBRYANTHEMUM BICOLORUM –
Two-coloured Fig Marigold.

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dividing into many branches, and extending every way two or three feet; leaves thick, rough, almost heart-shaped, grey, on long footstalks; flowers axillary, less than those of the Cucumber, of a pale yellow colour, with a greenish bottom. When the fruit is designed for medicinal use, it should be gathered before it is ripe, otherwise the greatest part of the juice, which is the only valuable part, will be lost; for the expressed juice is not to be compared with that which runs out of itself; and the Elaterium made from the clear juice is whiter, and will keep much longer. The dried juice or feculæ of the fruit, known in the shops by the name of *Elaterium*, is the only part now medicinally employed. The method for preparing this medicine, is to slit the ripe fruit, and pass the juice, very lightly pressed, through a very fine sieve into a glass vessel; then to set it by for some hours, until the thicker part has subsided; to pour off the thinner part swimming at the top, and separate the rest by filtering; to cover the thicker part which remains after filtration with a linen cloth, and to dry it with a gentle heat. The sensible qualities of this inspissated juice are not remarkable either to the smell or tase: it is inflammable, and dissolves readily in water or spirituous menstrua. Elaterium is undoubtedly the most violent purgative in the Materia Medica, and ought therefore to be administered with great caution, and only where milder cathartics have proved ineffectual. Pauli, Sydenham, and Lister, have particularly recommended it in hydropic cases. The dose is from half a grain to three grains. The most prudent and effectual way in which dropsies are treated with this remedy, is by repeating it at short intervals in small doses. We call it *Wild, Spirting, Squirting*, or *Asses Cucumber*; and the French, *Concombre sauvage ou d'âne.*—Native of the south of Europe. It is easily propagated by seeds, which, if permitted to scatter, will come up in the following spring: or if the seeds be sown in a bed of light earth, the plants will come up in about a month after, and may be transplanted to an open spot of ground, in rows at three or four feet distance, and almost as far asunder in the rows; if these are carefully transplanted while young, there will be little hazard of their growing; and after they have taken new root, they will require no further care, but to keep them clear from weeds. If the ground is dry in which they are planted, the roots will continue three or four years, unless the winter should prove very severe.

Monarda; a genus of the class Diandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, tubular, cylindric, striated, with a five-toothed equal mouth, permanent. *Corolla:* unequal; tube cylindric, longer than the calix; border ringent; upper lip straight, narrow, linear, entire; lower lip reflex, broader, trifid; middle segment longer, narrower, emarginate; lateral blunt. *Stamina:* filamenta two, bristle-shaped, the length of the upper lip, in which they are involved; antheræ compressed, truncate at top, convex below, erect. *Pistil:* germen four-cleft; style filiform, involved with the stamina; stigma bifid, acute. *Pericarp:* none. *Calix:* containing the seeds at the bottom. *Seeds:* four, roundish. Essential Character. *Corolla:* irregular; the upper lip linear, involving the filamenta. *Seeds:* four.——The species are,

1. Monarda Fistulosa; *Purple Monarda.* Leaves oblong-lanceolate, cordate, villose, flat. Root perennial, composed of many strong fibres, and spreading far on every side; stem nearly three feet high, and, as well as the branches, terminated by heads of purple flowers.—Native of Canada. This, and the four following sorts, may be propagated by parting their roots; the first does not multiply so fast as the third, but as that produces plenty of seeds, so it may be easily propagated that way. If the seeds are sown in autumn soon after they are ripe, the plants will come up the following spring; but if they are not sown till spring, the plants seldom rise till the next year. When the plants are come up, and fit to remove, they should be transplanted into a shady border about nine inches' distance, and when they have taken new root, they will require no other care but to keep them clean from weeds till the autumn, when they should be transplanted into the borders where they are to remain. The following summer they will flower, and produce ripe seeds, but the roots will continue several years, and may be parted every other year to increase them. This loves a soft loamy soil, and a situation not too much exposed to the sun.

2. Monarda Oblongata; *Long-leaved Monarda.* Leaves oblong-lanceolate, rounded, attenuate at the base, villose, flat. —Native of N. America; flowering from July to September.

3. Monarda Didyma; *Scarlet Monarda*, or *Oswego Tea.* Leaves ovate, smooth; heads in whorls; flowers subdidynamous; stem acute-angled. Root perennial; stems about two feet high; flowers in large heads or whorls at the top of the stalk, of a bright red colour.—This seldom ripens seed in England, but increases fast enough by its creeping roots, as also by slips or cuttings, which, if planted in a shady border in May, will take root in the same manner as Mint or Balm; but as the roots multiply so fast, there is seldom occasion to use any other method to propagate them. It delights in a moist light soil, and in a situation where the plants have only the morning sun, where they will continue in flower longer than those which are exposed to the full sun. This is a very ornamental plant in gardens, and the scent of the leaves is very refreshing and agreeable to most people, and some are very fond of the tea made with the young leaves.

4. Monarda Rugosa; *White Monarda.* Leaves ovate-lanceolate, cordate, smooth, wrinkled. Flowers white.—Native of North America. See the first species.

5. Monarda Clinopodia; *Wild Basil-leaved Monarda.* Leaves ovate-lanceolate, rounded at the base, unequal, smooth. Root creeping.—Native of Virginia. See the first species.

6. Monarda Punctata; *Spotted Monarda.* Flowers in whorls; corollas dotted; bractes coloured. Stems about two feet high, branching out from the bottom to the top; flowers of a dirty yellow colour, spotted with purple.—Native of North America. It is propagated by seeds sown on a border of light earth exposed to the east. When the plants are fit to remove, they may be transplanted into a shady border; and if they should shoot up stalks to flower, they should be cut down to strengthen the roots, that they may put out lateral buds, for when they are permitted to flower the first year, the roots seldom live through the winter. In autumn the plants may be removed into open borders, where they will flower the following summer; and if the season should prove dry, they must be duly watered.

7. Monarda Ciliata. Flowers in whorls; corollas longer than the involucre. Root creeping; stem hairy, thickish, a foot high and more, with few joints; flowers large, blue, elegantly marked with dark purple spots.—Discovered in Virginia.

8. Monarda Kalmiana. Heads large, simple; leaves oblong, attenuate-serrate, covered over with hairs; rough stalk acute-angled; petioles ciliate, pilose; bracteæ coloured, lanceolate, attenuate; calices and corollæ pubescent. Flowers very long, of a beautiful crimson.—It grows in boggy woods in black rich soil near Onondago and Oswego, New York.

9. Monarda Gracilis. Plant very smooth; heads small, lateral, and terminal; bracteæ linear, ciliate; calices pubescent, ciliate; corollæ short, glabrous; leaves linear-lanceolate, acuminate, serrate, glabrous; stalk obtuse-angled, glabrous.

flowers yellowish white.—It grows on the mountains of South Carolina and Virginia.

10. Monarda Oblongata. Plant rough all over; heads simple; bracteæ ovate, acute; calices short; teeth divaricate; stalk obtuse-angled, rough on the upper part; flowers pale purple.—Found in the mountains of Pennsylvania, &c.

11. Monarda Hirsuta. Plant very rough all over, with long white hairs; flowers small, verticillate; bracteæ very short, oblong, acuminate; calices with long awns; leaves ovate, acuminate, serrate, with long petioles; stalk acute-angled, rough; flowers small, very pale purple.—It grows on the high mountains of North Carolina and Virginia.

Monetia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, ventricose, four-toothed, two of the divisions deeper; segments lanceolate, acute, reflex, permanent. *Corolla:* petals four, linear, acute, recurved, longer than the calix. *Stamina:* filamenta four, erect, inserted into the receptacle, almost the length of the corolla; antheræ ovate, incumbent. *Pistil:* germen superior, slightly four-cornered, ending in a thickish conical style, shorter than the stamina; stigma acute. *Pericarp:* berry juiceless, globular, with a little point, surrounded by the calix, two-celled. *Seeds:* solitary, flat on one side, convex on the other. Essential Character. *Calix:* four-cleft. *Petals:* four. *Berry:* two-celled; seeds solitary. ——The species are,

1. Monetia Barlerioides; *Four-spined Monetia.* Spines four; leaves smooth on both sides. Stem upright, full of chinks, ash-coloured; branches opposite, diffused, dense, ash-coloured; leaves opposite, spreading, ovate or ovate-lanceolate, entire, acuminate. It is a middle-sized prickly shrub.—Native of the East Indies, and the Cape.

2. Monetia Diacantha; *Two-spined Monetia.* Spines two; leaves downy beneath. An evergreen shrub, about six feet high. The whole herb has a bitter flavour.—Native of the East Indies.

Moneywort. See *Anagallis* and *Sibthorpia.*

Monkey's Bread. See *Adansonia.*

Monk's Hood. See *Aconitum.*

Monk's Rhubarb. See *Rumex.*

Monnieria; a genus of the class Diadelphia, order Pentandria.—Generic Character. *Calix:* perianth five-parted, permanent; upper segment linear, long, curved in, covering the corolla; the outer lanceolate, and shorter by half; the rest blunt, short. *Corolla:* one-petalled, tubular, ringent; tube cylindric, more contracted in the middle, curved; border two-lipped; upper lip undivided, blunt, ovate; lower lip four-cleft, straight; segments oblong, blunt; nectary an ovate scalelet at the base of the germen, below the lower base. *Stamina:* filamenta two, flat, membranaceous; upper concave, bifid at top; lower flat, trifid; antheræ on the upper filamentum two, connate, hirsute within, including the stigma; on the lower filamentum three, round, very minute. *Pistil:* germen roundish, five-lobed, five-cornered; style solitary, filiform; stigma headed, oblong, flat within, orbicular with a sharp edge. *Pericarp:* capsules five, ovate, compressed, two-valved along half the suture. *Seeds:* solitary, ovate, with the inner margin straighter, blunter, inclosed in a two-valved, dry, deciduous aril. Essential Character. *Calix:* five-parted, with the upper segment oblong. *Corolla:* ringent. *Stamina:* two, the upper with two antheræ, the lower with three. *Capsules:* five, one-seeded.——The only known species is,

1. Monnieria Trifolia. This is an annual plant, with a dichotomous stem, ternate leaves, and white flowers in a bifid spike.—Native of America.

Monotropa; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* none, unless the five outer petals be taken for a coloured calix. *Corolla:* petals ten, oblong, parallel, erect, serrate at the tips, deciduous, of which the alternate outer ones are gibbous at the base, inwardly concave, melliferous. *Stamina:* filamenta ten, awl-shaped, erect, simple; antheræ simple. *Pistil:* germen roundish, acuminate; style cylindric, the length of the stamina; stigma blunt-headed. *Pericarp:* capsule ovate, five-cornered, blunt, five-valved. *Seeds:* numerous, chaffy. *Observe.* Such is the terminating flower; but if there be any lateral flowers, they exclude a fifth part of the number in all parts of the fructification. Essential Character. *Calix:* none. *Petals:* ten, the five outer hollowed, melliferous at the base. *Capsule:* five-valved; a fifth part excluded in some. ——The species are,

1. Monotropa Hypopithys; *Yellow Bird's Nest.* Lateral flowers eight-stamined, terminating; flower ten-stamined. Root composed of imbricate scales, and parasitical, the radical fibres adhering to the roots of trees under which it grows; stem from five to seven inches high, upright, not branched. Linneus remarks, that the whole plant smells sweet, and is of a pale yellow colour; which peculiarity is generally confined to parasitical plants, and such as grow in very shady situations. The Swedes give it dry to sheep affected with the rot.—Native of many parts of Europe, as Sweden, Denmark, Germany, France, Italy, and also in Canada, in woods, especially in fir woods where the ground is covered with rotten leaves, at the roots of fir, pine, beech, and oak. Also in Great Britain, as in Stoken Church Woods, and between Nettlebed and Henley in Oxfordshire; frequent in Bedfordshire, Buckinghamshire, and Berkshire; at Maidstone in Kent; Langley in Hertfordshire; in the beech woods of Sussex; in Uley in Gloucestershire; Enville in Staffordshire; Shottisham and Stoke in Norfolk; but not common in Scotland.

2. Monotropa Uniflora. Stem one-flowered; flower ten-stamined. Root a dense congeries of entangled fibres. Stem single, fleshy, the size of a straw.—Native of North America.

3. Monotropa Lanuginosa. Scape spiciflorous; bracteæ and flowers lanuginose on every side.—It is a parasitic plant, growing on the roots of beech and other trees from Pennsylvania to Carolina.

4. Monotropa Morisoniana. Scape elongate, very straight, with one flower; scales distant; flower erect, decandrous.—It grows in the shady woods of Virginia and Carolina.

Monsonia; a genus of the class Monadelphia, order Dodecandria.—Generic Character. *Calix:* perianth five-leaved; leaflets lanceolate, awned, equal, permanent. *Corolla:* petals five, obovate, præmorse-toothed, longer than the calix, inserted into the base of the pitcher of the stamina. *Stamina:* filamenta fifteen, united in five bodies, three in each, all connected at the base, and forming a very short pitcher; antheræ oblong. *Pistil:* germen five-cornered, short; style awl-shaped; stigmas five, oblong. *Pericarp:* capsule five-cornered, five-celled; each cell fixed to a very long, twisted, terminating tail. *Seeds:* solitary. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Stamina:* fifteen, united into five filamenta. *Style:* five-cleft. *Capsule:* five-grained.——The species are,

1. Monsonia Speciosa; *Fine-leaved Monsonia.* Leaves quinate; leaflets bipinnate. Flower handsome.—Native of the Cape. This may be increased by cuttings of the roots planted in pots of good mould, and plunged in a tan-pit, watering them occasionally: in due time buds will appear on the tops of the cuttings. It may be treated as a hardy greenhouse plant, and sheltered under a frame in winter.

Three Species of Moræa, from the Cape?

G. Dobie sc.

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2. Monsonia Lobata; *Broad-leaved Monsonia.* Leaves cordate-lobed, toothed.—Native of the Cape.

3. Monsonia Ovata; *Undulated Monsonia.* Leaves oblong, subcordate, crenate. waved.—Native of the Cape.

4. Monsonia Spinosa; *Thorny Monsonia.* Leaves elliptical, pointed, entire; footstalks permanent, hardened into thorns. Stem shrubby, branched, beset with thorns.—Native place uncertain.

Montia; a genus of the class Triandria, order Trigynia. —Generic Character. *Calix:* perianth two-leaved; leaflets ovate, concave, blunt, erect, permanent. *Corolla:* one-petalled, five-parted, three of the segments alternate, smaller, staminiferous. *Stamina:* filamenta three, capillary, the length of the corolla, into which they are inserted; antheræ small. *Pistil:* germen turbinate; styles three, villose, spreading; stigmas simple. *Pericarp:* capsule turbinate, blunt, covered, one-celled, three-valved. *Seeds:* three, roundish. *Observe.* The calix often varies with three leaflets, and then it often produces five stamina. Essential Character. *Calix:* two-leaved. *Corolla:* one-petalled, irregular. *Capsule:* one-celled, two-valved.——The only known species is,

1. Montia Fontana; *Water Chickweed.* Root annual, fibrous; stalks numerous, round, smooth, succulent, reddish, spreading on the ground, and sometimes striking root, two or three inches in length, branched and jointed; leaves opposite, sessile, oblong, rather fleshy, smooth, and of a pale green colour; peduncles generally three together, each supporting a flower; corolla white. The flowers usually appear in a half-opened state, whence one of the English names *Blinks:* but when the sun shines on them, they expand.—Native of many parts of Europe; flowering in May, and ripening its seed early in June. In England it is found on Black-heath, Hampstead-heath, Hanging-wood, Charlton, about Streatham and Sydenham; on Harefield Common; and on the wet heaths in Norfolk; on the Hill of Health, and Gamlingay Heath, Cambridgeshire; at Badby in Northamptonshire; Bridgeford in Nottinghamshire; Hockley Pool Grate, near Birmingham; Shotover-hill and South Leigh-heath in Oxfordshire; and Marazion-marsh in Cornwall.

Montinia; a genus of the class Diœcia, order Tetrandria; (according to Smith, class Tetrandria, order Monogynia.)— Generic Character. *Male. Calix:* perianth four-toothed, very short, erect. *Corolla:* petals four, ovate, very blunt, spreading, inserted into the calix. *Stamina:* filamenta four. *Female. Calix:* superior, and as in the male. *Corolla:* as in the male. *Stamina:* filamenta four, within the teeth of the calix, very short; antheræ none. *Pistil:* germen inferior, concave-plane, smooth; style cylindric, thick, bifid, shorter than the corolla; stigmas kindney-form. *Pericarp:* capsule ovate-oblong, two-celled, gaping longitudinally; partition thick, two-lobed. *Seeds:* very many, imbricate, ovate, compressed, winged at the edge. *Observe.* The male flowers are sometimes five-cleft, five-stamined. Essential Character. *Male. Calix:* four-toothed, superior. *Petals:* four. *Female. Filamenta:* barren. *Style:* bifid. *Capsule:* oblong, two-celled.——The only known species is,

1. Montinia Acris; *Glaucous Montinia.* Leaves alternate, oblong-oval, blunt, nerved, veined, quite entire, smooth, thickish, erect; root woody; stem shrubby, a foot high, flowers terminating, solitary, white.—Native of the Cape.

Moon-seed. See *Menispermum.*

Moon Trefoil. See *Medicago.*

Moonwort. See *Lunaria* and *Osmunda.*

Moræa; a genus of the class Triandria, order Monogynia. —Generic Character. *Calix:* spathes two-valved. *Corolla:* six-petalled; three inner parts spreading, the rest as in Iris. *Stamina:* filamenta three, short; antheræ oblong. *Pistil:* germen inferior; style simple; stigmas three, bifid. *Pericarp:* capsule three-cornered, three-grooved, three-celled. *Seeds:* very many, round. Essential Character. *Corolla:* six-petalled, the three inner parts spreading, narrower; stigma trifid.—The plants of this genus are propagated by seeds, offsets, or partings of the roots; all which operations are best performed in August. Sow the seeds in small pots, plunged into a bed of old tanner's bark, under a common frame. They also require this sort of shelter in winter, being apt to draw up weak when placed in the dry-stove. If they can enjoy the free air even in winter when the weather is not cold, and are secured from frost and hard rain, they flower and ripen their seeds better than with more tender management. In summer they should be fully exposed to the open air till October, when they may be removed into shelter.——The species are,

* *Scape ancipital.*

1. Moræa Melalenca; *Dark-flowered Moræa.* Scape ancipital; leaves subfalcate; flowers subsolitary. Petals alternate, the three outer white, the three inner smaller and black; stigma many-parted.—Native of the Cape.

2. Moræa Spiralis; *Spiral-flowered Moræa.* Scape compressed, jointed; leaves erect; flowers alternate, mostly directed one way. Corolla equal, greenish-white on the outside, white within, rolled spirally during the night.—Native of the Cape.

3. Moræa Pusilla; *Dwarf Moræa.* Scape ancipital; leaves distich; flowers subsolitary. Corolla blue, becoming spiral when it is past.—Native of the Cape.

4. Moræa Magellanica; *Magellanic Moræa.* Stem ancipital, leafy; leaves distich, sickle-shaped; flower terminating, solitary; corolla white.—Native of the Straits of Magellan.

5. Moræa Gladiata; *Sword-leaved Moræa.* Scape and leaves compressed; spike lateral, solitary; involucre only half the length of it. Corolla yellow.—Native of the Cape.

6. Moræa Aphylla; *Leafless Moræa.* Scape and leaves compressed; spike lateral, solitary; involucre many times shorter.—Native of the Cape.

7. Moræa Filiformis; *Filiform Moræa.* Scape and leaves compressed, subfiliform; flower solitary, terminating.—Native of the Cape.

** *Scape round.*

8. Moræa Spathacea; *Sheathy Moræa.* Scape and leaves round, hanging down; spikes lateral, aggregate. Corolla yellow.—It abounds on the hills near the Cape.

9. Moræa Flexuosa. Scape round, jointed; leaf reflex, somewhat waved, nerved.—Native of the Cape.

10. Moræa Polyanthos. Scape round; leaves flexuose, erect, alternate; segments of the corolla smaller. Flowers one, two, or three; corolla blue.—Native of the Cape.

11. Moræa Cœrulea. Scape round; leaves distich; heads of flowers alternate; spathes membranaceous, entire. Flowers lateral, spike-headed, very many; corolla blue; antheræ yellow.—Native of the Cape.

12. Moræa Plicata. Scape round; leaves petioled, oblong, nerved, plaited; racemes bifid. Flowers white.—Native of the West Indies, as in the mountainous pastures of the western parts of Jamaica; flowering the whole year, opening at four o'clock in the afternoon, only one flower coming out at a time.

13. Moræa Umbellata. Scape round, striated; spikes of flowers umbel-panicled; involucres two-leaved, very long. Flowers blue.—Native of the Cape.

14. Moræa Crispa. Scape round, jointed; leaf convoluted, curled, reflex. Flowers terminating, peduncled, few of a blue colour.—Native of the Cape.

15. Moræa Iriopetala. Scape round; leaves linear; stigma

multifid. There are two varieties, one with an orange corolla, the other dirty white.—All natives of the Cape.

16. Moræa Iridioides. Scape round; leaves distich, linear; flower subsolitary, terminating.—Native of the Levant.

17. Moræa Chinensis. Corolla six-petalled; style inclined.—Native of China.

Morina; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* double; perianth of the fruit inferior, one-leafed, cylindric, tubular, permanent; mouth toothed; toothlets two, opposite, longer, all subulate, acute; perianth of the flower superior, one-leafed, tubular, bifid; segments emarginate, blunt, permanent, upright, the size of the outer. *Corolla:* one-petalled, two-lipped; tube very long, widening above, a little curved in, filiform at bottom; border flat, blunt; upper lip semibifid, smaller; lower trifid; segments all blunt, uniform, the middle one more lengthened. *Stamina:* filamenta two, bristle-shaped, approximating to the style, parallel, shorter than the border; antheræ erect, cordate, distant. *Pistil:* germen globular, under the receptacle of the flower; style longer than the stamina, filiform; stigma headed, peltate, bent in. *Pericarp:* none. *Seed:* single, roundish, crowned with the calix of the flower. Essential Character. *Calix:* of the fruit one-leafed, toothed: of the flower, bifid. *Corolla:* irregular. *Seed:* one, under the calix of the flower.——The only species is,

1. Morina Persica. Root taper and thick, running deep into the ground, sending out several thick strong fibres as large as a finger; stem nearly three feet high, smooth, purplish towards the bottom.—Native of Persia near Ispahan. It is propagated by seed sown soon after it is ripe in the autumn, in open beds or borders of fresh light earth. They seldom come up the first year.

Morinda; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* receptacle common, roundish, collecting sessile flowers into a globe: perianth five-toothed, scarcely observable, superior. *Corolla:* one-petalled, funnel-form; tube cylindric; border five-cleft, acute, spreading very much; segments lanceolate, flat. *Stamina:* filamenta five, very short, inserted into the tube at top; antheræ linear, erect, almost the length of the tube. *Pistil:* germen inferior; style simple; stigma bifid, thickish. *Pericarp:* berry subovate, angular, compressed on all sides by the next, truncate, one-celled. *Seeds:* two, convex on one side, flat on the other. Essential Character. *Flowers:* aggregate, one-petalled; stigma bifid. *Drupes:* aggregate.——Six species are enumerated; among which are,

1. Morinda Umbellata; *Narrow-leaved Morinda.* Erect: leaves lanceolate, ovate; peduncles clustered. The root of this tree is used in dyeing yellow.—Native of the East Indies, Cochin-china, and the Society Isles.

2. Morinda Citrifolia; *Broad-leaved Morinda.* Arboreous, with solitary peduncles. The bark of the root affords a yellow dye.—Native of the East Indies.

3. Morinda Royoc; *Procumbent Morinda.* Procumbent. The roots dye linen of a dark hue, and would probably be useful to the dyers.—This shrub is a native of South America, the West Indies, and Cochin-china.

Morisonia; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth one-leafed, ventricose, bursting, bifid, spreading at the mouth, blunt, shrivelling. *Corolla:* petals four, blunt, somewhat oblong. *Stamina:* filamenta numerous, awl-shaped, shorter than the corolla, connate into a funnel at the base; antheræ oblong, erect. *Pistil:* germen pedicelled, ovate; style none; stigma headed, plano-convex, umbilicate with a dot. *Pericarp:* berry globular, with a hard smooth rind, one-celled, pedicelled. *Seeds:* several, kidney-form, nestling. Essential Character. *Calix:* simple, bifid. *Petals:* four. *Pistil:* one. *Berry:* with a hard rind, one-celled, many-seeded, pedicelled.——The only species known is,

1. Morisonia Americana. Leaves oblong, blunt or acuminate, quite entire. An upright, rather inelegant tree, seldom more than fifteen feet high.—Native of South America and the islands of the West Indies.

Morus; a genus of the class Monœcia, order Tetrandria.—Generic Character. *Male Flowers,* in an ament. *Calix:* perianth four-parted; leaflets ovate-concave. *Corolla:* none. *Stamina:* filamenta four, awl-shaped, erect, longer than the calix, one within each calicine leaf; antheræ simple. *Female Flowers,* heaped either on the same, or a different individual from the males. *Calix:* perianth four-leaved; leaflets roundish, blunt, permanent, the two opposite outer ones incumbent. *Corolla:* none. *Pistil:* germen cordate; styles two, awl-shaped, long, reflex, rugged; stigmas simple. *Pericarp:* none. *Calix:* very large, fleshy, becomes succulent like a berry. *Seed:* single, ovate, acute. Essential Character. *Male. Calix:* four-parted. *Corolla:* none. *Female. Calix:* four-leaved. *Corolla:* none. *Styles:* two. *Calix:* becoming a berry. *Seed:* one.——The species are,

1. Morus Alba; *White Mulberry Tree.* Leaves obliquely cordate, even. This is a middle-sized tree, with a whitish bark, and spreading branches; leaves subserrate, undivided, or three-lobed, some cut, petioled, scattered; berries lateral, insipid, pale, oblong. There are two varieties, which differ in the shape of their leaves, and the size and colour of their fruit. Mr. Evelyn remarks, that the leaves of this tree are far more tender than those of the next species, and sooner produced by at least a fortnight; nor is it less beautiful to the eye than the fairest Elm, and very proper for walks and avenues. The timber will last in winter as well as the most solid oak, and the bark makes good and tough bast-ropes. In France and Italy this tree is cultivated for the sake of its leaves, to feed silk-worms; for which purpose the Spaniards of Valencia prefer it to the next species, but those of Granada prefer the latter, which the Persians also use; and Mr. Miller was assured by a gentleman who had tried both sorts, that the worms fed with the leaves of the next species produced much the best silk, but that it should never be given after the worms have eaten for some time of the former, lest they should burst.—*Culture.* The most expeditious method of raising this tree in quantity is from the seeds, which may be procured in plenty from the south of France, or Italy. Prepare a fine warm border of rich mellow earth, or, if that cannot easily be had, make a moderate hot-bed, arched over with hoops, and covered with mats. Sow the seeds towards the end of March in drills, covering them with light earth a quarter of an inch deep: in very dry weather water the bed gently and frequently, in the heat of the day shade it with mats, and cover it when the nights are cold. In five or six weeks the plants will come up, and, being tender, must be guarded against frosty mornings, which often happen in May. During summer keep them clear from weeds, cover them from the extreme heat of the sun, and water them in dry weather. In autumn cover them again when the first frosts come, and continue to protect them through the first winter. The following March transplant them into the nursery, there to remain two or three years, and then be removed to where they are to remain; or, if not very strong, they had better remain in the seed-bed two years before they are planted out in the nursery, in rows at two feet and a half distance, and one foot and a half asunder in the rows, there to continue till strong enough to plant out. The trees which are designed to feed silk-worms

should never be suffered to grow tall, but rather kept in a sort of hedge; and instead of pulling off the leaves singly, they should be sheared off together with their young branches, which is sooner done, and also less injurious to the tree.

2. Morus Nigra; *Common* or *Black Mulberry Tree*. Leaves cordate, rugged. This is a stronger tree than the preceding; the fruit is of a dark blackish red, and more acid.—Native of Persia, whence it was first brought to the southern parts of Europe, and is now common wherever the winters are not very severe. There is a variety with a small and flavourless fruit. The fresh bark of the Mulberry root, boiled in water, makes an excellent medicine for the jaundice, and all complaints of the liver. It removes worms and obstructions, and operates by urine. There is a very pleasant syrup made from the juice of the ripe fruit, with double its weight of refined sugar. It is very cooling, and is excellent for sore mouths, and to allay the thirst in fevers. The dry unripe fruit cools, dries, and binds very much, and is therefore good in purgings, bloody fluxes, immoderate menses, spitting of blood, and externally in ulcers of the mouth and parts adjacent. The ripe fruit taken before dinner promotes digestion, but if taken afterwards is injurious to the stomach. The berries, before they become too ripe, quench thirst and excite an appetite. A gargle made of the leaves, or with the leaves and bark boiled in water, is good for the tooth-ach. The leaves boiled in oil, make a good ointment for burns and scalds.—*Culture*. This tree delights in rich light earth, and where there is a depth of soil, as in most of the old kitchen-gardens about London; in some of which are trees of a very great age, which are healthy and fruitful, and their fruit larger and better flavoured than those of younger trees. In a very stiff soil, or on shallow ground, whether of clay, chalk, or gravel, the trunk and branches are commonly covered with moss, and the little fruit produced is small, ill-tasted, and ripens late. If this tree be planted in a situation where it is defended from strong south and north-west winds, it will preserve the fruit from being blown off; but this shelter, whether it be trees or buildings, should be at such a distance as not to keep off the sun; for where the fruit has not the benefit of his rays to dissipate the morning dews early, it will turn mouldy, and rot upon the trees. The old Mulberry trees are not only more fruitful than the young, but their fruit are much larger and better flavoured; so that where there are any of these old trees, it is the best way to propagate from them, and to make choice of the most fruitful branches. The usual method of propagating these trees, is by *laying down their branches*, which will take root in one year, and are then separated from the old trees; but as the most fruitful branches are often so far from the ground as not to be layed, unless by raising boxes or baskets of earth upon supports for this purpose, the better way is to propagate them by *cuttings*, which, if rightly chosen and skilfully managed, will take root very well; and in this method there will be no difficulty in having them from trees at a distance, and from the most fruitful branches. These cuttings should be shoots of the former year, with one joint of the two years' wood to their bottom; they should not be shortened, but planted their full length, leaving two or three buds above ground. The best season for planting them is in March, after the danger of hard frost is over; they should be planted in light rich earth, pressing the ground pretty close about them; and if they are covered with glasses, it will forward their putting out roots: but where there is not such conveniency, the ground about them should be covered with moss, to prevent its drying, and when this is carefully done, the cuttings will require but little water, and will succeed much better than with having much wet. If they succeed well, and make good shoots, they may be transplanted the following spring into a nursery, where they should be regularly trained to stems by fixing down stakes by each, to which the principal shoots should be fastened; and most of the lateral branches should be closely pruned off, leaving only two or three of the weakest to detain the sap, for the augmentation of the stem; for when they are quite divested of their side-shoots, the sap is mounted to the top, so that the heads of the trees grow too fast for the stems, and become too weighty for their support. In about four years' growth in the nursery they will be fit to transplant where they are to remain; for these trees may be more safely transplanted while young than when they are of a larger size. If the cuttings are planted in a bed fully exposed to the sun, it will be proper to arch the bed over with hoops, that they may be shaded with mats in the heat of the day during spring, till they have put out roots; after which, the more they are exposed to the sun, the better they will succeed, provided the ground is covered with moss or mulch to prevent its drying, for the sun will harden the shoots, and thereby they will be in less danger of suffering by the early frosts in autumn; for, when in a shady situation, they are apt to grow vigorously in summer, and will be replete with moisture, and exposed to the early frosts in October, which frequently kill their tops; and if the succeeding winter prove severe, they often die down to their roots, and sometimes are entirely destroyed. *Cuttings* may be planted not only in March, but also in October. To propagate the Mulberry by *layers*, a number of trees must be planted for stools two yards asunder. A few stools will soon produce many layers, for they throw out plenty of young branches when the head is taken off. When the stools have shot forth young wood fit for laying, in the beginning of winter let the earth be excavated round each stool, and let the preceding summer shoots be slit at a joint, and laid therein, fixing them down with a peg, filling the interstices with fine mould, levelling the ground, and cutting the young twigs to one eye above the surface. In the autumn following, the layers will all probably have taken good root, and have made a considerable shoot in the stem, so that they will be ready for the nursery-ground, in which they are to be managed in the same way as the seedlings. The second year after, the stools will have a second crop of young wood for laying. Mulberry trees may also be increased by cuttings planted at the end of June or the beginning of July, in pots, plunged up to their rims in the stove, where, if water and shade be constantly afforded them, they will strike root, and become good plants. If an old Mulberry tree becomes a bad bearer, or casts the fruit before it is ripe, cut a trench two feet deep round the tree, and about four feet from the trunk; fill it with fresh mould enriched with cow-dung; and, as the large root smay be raised without inconvenience, let the compost be put under them so as to make the bed, over which the tree stands, as rich as possible. At the same time let the old wood be cut from the head of the tree, that the young may have space to grow. Observe also, that if you expect plenty of fruit, the ground must not be disturbed near the tree, for the feeding fibres of the roots will otherwise be cut off by the spade when the fruit requires the greatest nourishment. There is never any occasion for pruning these trees, beyond cutting off any of the branches which may go across others, so as to rub and wound their bark by their motion; for their shoots should never be shortened, because the fruit is produced on the young wood. The Mulberry is remarkable for putting out its leaves late; so that when they appear, the gardener may take it for granted that all danger from frost is over.

3. Morus Papyrifera; *Paper Mulberry Tree.* Leaves palmate; fruit hispid. This tree makes very strong vigorous shoots, but seems not to be of tall growth, for it sends out many lateral branches from the root upwards. The leaves are large, some of them entire, others deeply cut into three or five lobes, especially whilst the trees are young; they are dark green, and rough to the touch on the upper surface, but pale green and somewhat hairy on the under side, falling off on the first approach of frost in autumn. The fruit is little larger than peas, surrounded with long purple hairs, when ripe changing to a black purple colour, and full of sweet juice.—It is a native of Japan and the South Sea Islands; according to Mr. Miller, of China also, and South Carolina, whence he received the seeds. The inhabitants of Japan make paper of the bark. They cultivate the trees for this purpose on the mountains, much after the same manner as Osiers are cultivated with us, cutting down the young shoots in December, after the leaves are fallen. These being divided into rods of three feet in length, or shorter, are gathered into bundles to be boiled. If the shoots are dry, they must be softened in water twenty-four hours. The bundles are boiled very close together, and placed erect in a large copper properly closed: the boiling is continued till the separation of the bark displays the naked wood. Then the stalks are loosened out of the bundles, and allowed to cool; after which, by a longitudinal incision, the bark is stripped off and dried, the wood being rejected. When this bark is to be purified, it is put three or four hours in water, when, being sufficiently softened, the cuticle, which is of a dark colour, together with the greenish surface of the inner bark, is pared off. At the same time the stronger bark is separated from the more tender; the former making the whitest and best paper, the latter a dark, weak, and inferior kind. If any bark appears that is old, it is set aside for a thicker paper of worse quality, along with the knotty and blemished parts of the bark. It is now boiled in a lye that is clear and strained; care being taken to stir the substance, as soon as it begins to boil, with a strong reed, and to pour in of the lye gradually as much as is necessary for stopping the evaporation, and restoring the liquor that is lost. The boiling is to cease when the materials can be split, by a slight touch of the finger, into fibres and down. Next it is to be washed, which is a thing of some moment; for if washed too short a time, the paper will be strong indeed, but too rough, and of an inferior quality; if too long, it will be whiter, but of a fat consistence, lax, and less fit for writing. Being sufficiently washed, the materials are put upon a thick, smooth, wooden table, and stoutly beat by two or three men, with battons of hard wood, into a pulp; which being put in water, separates like grains of meal. Thus prepared, it is put into a narrow vat; an infusion of rice, and a mucous water of the infusion of the root of Manihot, being added to it. These three are to be stirred with a clean slender reed, till reduced into a homogeneous liquor, of a due consistence. The prepared liquor is now put into a larger vat; whence the sheets are poured out one by one, and placed in heaps upon a table covered with a double mat; a small thread of reed being placed between the sheets at the edge, and projecting a little, so that they may be taken up singly when wanted; the heaps are covered with a plank of wood the size of the paper, upon which stones are put, at first of a light weight, but afterwards heavier, that all the wet may be pressed out by degrees. The following day, the weights being removed, each sheet is taken up by itself, and the operation is finished. The finest and whitest cloth, worn by the principal people at Otaheite, and in the Sandwich Islands, is made of the bark of this tree; and this, when dyed red, takes a better colour. The Bread Fruit Tree makes a cloth inferior in whiteness and softness, worn chiefly by the inferior people. Cloth is also made of a tree resembling the Wild Fig Tree of the West Indies. It is coarse and harsh, the colour of the darkest brown paper; but it is the most valuable, because it resists water. This is perfumed, and worn by the chiefs as a morning dress in Otaheite. The juice of the Paper Mulberry is used in China as a glue in gilding either paper or leather, but not wood.—This plant may be propagated by seeds, or by laying down the branches, or by cuttings in the manner directed for the common sort.

4. Morus Rubra; *Red Mulberry Tree.* Leaves cordate, villose underneath; aments cylindric. This tree will grow to the height of thirty or forty feet, sending forth many large branches. The leaves are not only larger but rougher than those of the Common Mulberry, though in other respects they somewhat resemble them. Parkinson, so long ago as 1629, says, that it grows quickly with us to a great tree, and that the fruit is longer and redder than the common sort, and of a very pleasant taste. This tree has not yet been propagated in this country, for though it has been budded and grafted upon the White and Black Mulberry, it has not succeeded. Being lofty, it cannot well be laid down, which is the method most likely to propagate it: it is very hardy, and will endure the cold of our climate in the open air very well. —Native of Virginia and Carolina.

5. Morus Indica; *Indian Mulberry.* Leaves ovate-oblong, equal on both sides, unequally serrate. This is a large tree, with a soft, thick, yellowish bark, and a milky juice like the fig, which is astringent. The branches come out on every side. The leaves are on short footstalks, rough, dark-green above, pale underneath, alternate. Fruit roundish, first green, then white, and finally dark red.—Native of the East Indies, Japan, and Cochin-china, where it is cultivated on a very extensive scale as a food for silk-worms, especially on the banks of rivers. This is too tender to live out of the bark-stove, where it must be treated as other tender plants, giving it but little water in winter. With this management it will retain its leaves all the year.

6. Morus Tatarica; *Tartarian Mulberry Tree.* Leaves ovate-oblong, equal on both sides, equally serrate. This is a shrub, irregularly branched, with a trunk seldom so big as the human arm; bark whitish gray; wood very hard, yellow, somewhat veined; branches slender, wand-like, round, smooth; branchlets leafy, bearing fruit at the base; berries small, on long peduncles, red or pale when ripe, insipid: they are eaten fresh, in a conserve, or dried; a wine and a spirit are made from them in Siberia and Russia, and the leaves are used for feeding silk-worms.—For its propagation and culture see the first and second species.

7. Morus Tinctoria; *Dyer's Mulberry*, or *Fustick-wood.* Leaves oblong, more produced on one side; spines axillary. This is a tall branching tree with a fine head, the whole abounding in a slightly glutinous milk of a sulphureous colour. It is a principal ingredient in most of our yellow dyes, for which it is chiefly imported into Europe, where it is well known under the name of Fustick-wood. The berries are sweet and wholesome, but not much eaten except by birds, who are the chief planters of it.—Native of the West Indies; but particularly abundant about Campeachy. This plant must be preserved in the bark-stove. The seeds come up freely in a hot-bed: when the plants are fit to remove, plant each in a separate small pot filled with fresh light earth, and plunged into a hot-bed of tanner's bark, shading them from the sun until they have taken new root, and then treating them as

other plants from hot countries. They retain their leaves a great part of the year in the stove.

Moss. See *Muscus.*—It is divided into many species; as, *Bottle Moss,* see *Splachnum; Club* and *Fir Moss,* see *Lycopodium; Heath Moss,* see *Coralloides; Wall Moss,* see *Bryum; Water Moss,* see *Fontinalis;* &c.

Moss,—is a term frequently used to signify a particular sort of earthy or boggy material, found in some low situations, in different parts of the kingdom, but particularly in the more northern districts, being formed by the decay of different vegetable and other substances. This earthy matter is of different natures in different situations, as wood moss, black peat-moss, flow-moss, or red-bog, &c. The first, which is principally composed of ligneous substances, is probably the best for manure; and the black peat, which is chiefly composed of heath, decayed sphagnum, and the roots of the eriophora, is the next in the goodness of its properties. The third, which is chiefly derived from the sphagnum in a fresher state, is the least useful. Mosses are of very different depths, textures, and qualities; but all of them are greatly impregnated and loaded with water, holding it like a sponge; some have the depth of not more than three or four feet, while others have as many yards. They require much draining and consolidating to bring them into cultivation. The most certain and short method for the improvement of moss land, if the ground be designed only for grass, and its situation be such as to admit of it, is this: first drain the moss, and, if there be heath upon it, burn that off, and make the surface even. Then make a dam at the lowest part, and a sluice, and work the water upon it through the winter. The mud which comes with the land-flood will bring a fine sward upon it in two or three years; and be afterwards a yearly manure; so that it will bear annual cutting, and, besides, be good pasture for cattle, after the sward is become strong enough to bear them.

Moss on Trees,—a distemper caused by the moss plant fixing itself upon them; which is highly prejudicial to the growth and increase of those both of the timber and fruit sorts; and much damages the fruit of the latter kind. The best remedy is the scraping it off from the body and large branches, by means of a kind of wooden knife that does not hurt the bark, or a piece of rough hair-cloth after soaking rain. But the most effectual cure is to remove the cause, which is the superfluous moisture at the roots of the trees, which should be drained off, and which may be greatly guarded against in the first planting of the trees, by not setting them too deep in the ground. In cases where trees stand thick in a cold moist ground, they are always covered with Moss; and the best way to remedy the fault is to thin them. When the young branches of trees are covered with a long and shaggy Moss, it utterly ruins them; and there is no way to prevent it but that of rubbing it off, or cutting the branches away near the trunk, and even to take off the head of the tree, if necessary; when, if the cause be removed by thinning the plantation or draining the land, the young shoots continue clear afterwards. This disease arises from the Moss plant establishing itself upon the trees which are in an unhealthy state of growth, or which have been planted too closely together, by which proper circulation of air and dryness are prevented. The trees are not merely injured by the plants establishing themselves upon them, and hindering their growth, but probably also by the large proportion of moisture that is attracted, and the dampness induced in consequence of it. In order to prevent or remove this evil, Mr. Forsyth advises the washing the trees with a mixture of fresh cow dung, urine, and soap-suds, in order that the establishment of the moss plants may be prevented, and the bark kept in a fine healthy condition. Where the disease proceeds from an unhealthy state of the trees in consequence of the unfriendly nature of the soil, the speedy removal of the Moss appears to be the only way of saving them from destruction. In some cases the only remedy is to cut down part of the trees, and to plough up the ground between those left remaining, and in the spring of the year, in moist weather, to scrape off the moss with an iron instrument made a little hollow, the better to surround the branches, and to carry it off the place: by cleansing the trees thus two or three times together, with carefully stirring the ground, the Moss may be entirely destroyed; but if part of the trees be not cut down, and the ground well stirred, rubbing off the Moss will signify little; for the cause not being removed, the effect will not cease, but the Moss will in a short time be as troublesome as ever.

Motherwort. See *Leonurus.*

Moth Mullein. See *Verbascum.*

Mould; a vegetable earth, the goodness of which may be known by the sight, smell, and touch. First by the sight: those moulds which are of a bright hazelly colour are counted the best: of this colour are the best loams, and also the best natural earth, and this will be better yet, if it cuts like butter, and does not stick obstinately, but is short, tolerably light, breaking into small clods, is sweet, will be tempered without crusting or clipping in dry weather, or turning to mortar in wet. The next to that, the dark grey and russet moulds are reckoned the best; the light and dark ash-colour are reckoned the worst, such as are usually found on common or heathy ground; the clear tawny is by no means to be approved; but that of a yellowish red colour is accounted the worst of all: this is commonly found in the wilds and waste parts of the country, and for the most part produces nothing but Furze and Fern, according as their bottoms are more or less of a light and sandy, or of a spewey gravel or clayey nature.—Secondly, by the smell: all lands that are good and wholesome, will, after rain or breaking up by the spade, emit a good smell.—Thirdly, by the touch: by this means we may discover whether it consists of substances entirely arenaceous, or clammy; or, as it is expressed by Mr. Evelyn, whether it be tender, fatty, detersive, or slippery, or more harsh, gritty, porous or friable. That being always the best that is between the two extremes, and does not contain the two different qualities of soft and hard mixed, of moist and dry, of churlish and mild, that is neither too unctuous nor too lean, but such as will dissolve, of a just consistence, between sand and clay, and such as will not stick to the spade or fingers upon every flash of rain. A loam, or brick mould, is not to be disapproved, as requiring little help or improvement but the spade, and is esteemed both by the gardener and florist.

Mountain Ash. See *Sorbus.*

Mouse-Ear. See *Hieracium* and *Myosotis.*

Mouse-Ear Chickweed. See *Cerastium.*

Mouse-Tail. See *Myosurus.*

Mowing.—In the mowing of grain crops, such scythes are used as are shorter in the blade than the common ones, and which, instead of a cradle, have two twigs of osier put semi-circularwise into holes made in the handles, near the blades, in such a manner that one semi-circle intersects the other; but for the cutting of grass, longer and thinner scythes are generally in use. In the cutting of grass crops for the purpose of converting them into hay, it is necessary, as a late practical writer states, that they should be in the most suitable states of growth and maturity for affording the best and most nutritious fodder. With this view, it would seem

that they should neither be cut at too early a period, nor suffered to stand too long; as, in the former case, there will be considerable loss in the drying, from the produce being in so soft and green a condition; and in the latter, from a large proportion of the nourishing properties being expended. It is probable therefore that grass, when mown before it becomes in full flower, while the rich saccharine juice is in part retained at the joints of the flower-stems, is in the most proper condition for being cut down, as at that period it must contain the largest proportion of nutritious materials, but which then begin to be absorbed and taken up in proportion as the flowers expand and the seeds ripen, so as to constitute the meal or starch of the seed-lobes, and is either dispersed upon the land, or fed upon by birds; the grass-stems with their leaves being left in a similar situation to that of the straw of ripened grain. But there are other circumstances besides those of ripeness, to be attended to in determining the period of cutting crops of grass, as, in some cases, when they are thick upon the ground the bottom parts become of a yellow colour before the flowering fully takes place; under such circumstances it will always be the most advisable practice to mow as soon as the weather will possibly admit; for if this be neglected, there will be great danger of its rotting, or at any rate of its acquiring a disagreeable flavour, and of becoming of but little value. Where grass is very tall, as is often the case in moist meadows, it is liable to fall down and lodge, by which the same effects are produced. In this case also the mowing should be performed as soon as possible, as, when much laid, it soon rots, and is of little or no use as hay. However, in cases where there is nothing of this sort, it appears evident, that the most proper time for performing the business is when the grass has begun to flower, before the seed-stems become hard and wiry; as at this period it would seem to contain the largest portion of useful matter. Besides, when left to stand too long, the after grass is less abundant, and the crumbling down of the stems occasions great additional loss in the different operations of hay-making. It may be noticed, that the usual time of cutting for hay, in the first crops, is from about the middle of June to the beginning of July, according to the nature of the land, or as the district is earlier or later with its produce. The chief art in the operation of mowing consists in cutting the crop as close to the surface of the ground as possible, and perfectly level, pointing the swathes well out, so as to leave scarcely any ridges under them. But in cutting rouen or second crops of grass, more attention in these different respects will be necessary than in the first, as the crops are mostly much lighter and more difficult to cut, the scythe being apt to rise and slip through the grass without cutting it fairly, except when in the hands of an expert workman. Crops of this sort should always be cut as much as possible when the dew is upon them, and as soon as ever there is a tolerable growth, as by waiting the season becomes more unfavourable for making them into hay; and unless well made, this hay is of hardly any value. When the grass has been decided to be in a proper condition for being cut down, a set of mowers proportioned to the extent of the crop should be at once provided. In some districts it is the custom to pay these labourers by the day, but the general and best practice is to let the work at a certain price per acre. The extent or proportion of ground that can be mown in any given space of time, must obviously vary much, according to the nature of the ground, the fulness of the crop, and the goodness of the workmen; but in general an acre is supposed a full day's work for an expert mower. In mowing barley, oats, or other grain crops, the corn is generally on the right hand of the workman; but M. de Lisle had a method of mowing wheat, in which the corn was at his left hand: he mowed it inward, bearing the corn he cuts on his scythe, till it comes to that which is standing, against which it gently leans. After every mower a gatherer follows, who may be a lad or a woman. The gatherer keeps within five or six feet of the mower, and being provided either with a hook or a stick about two feet long, gathers up the corn, making it into a gavel, and laying it gently on the ground: this must be done with spirit, as another mower immediately follows, and to every mower there is a particular gatherer. And to do this work properly, the mower should form but one track with his feet, advancing in a posture nearly as if he were going to fence, one foot chasing the other. In this manner the standing corn is mowed; and the workman should take care to have the wind at his left, as it bears the corn towards the scythe, and causes it to be cut nearer the ground. When wheat is bent, the workman takes the corn as it presents itself to him, which has the same effect as if the wind was at his left side. And when it is laid, it is more troublesome to the gatherer, because the corn is apt to be mixed with that which is standing; but a good mower takes advantage of the wind, and cuts it against the way it is laid. No particular directions can be given for corn that is lodged and entangled, unless it be to take it as it is inclined, as if the wind were on the back of the mower. The usual method of mowing grain is, however, in the same manner as grass, the scythe only having a cradle or bow fixed upon the heel of the handle. In the practice of every department of the kingdom, the scythe is swung horizontally, or nearly level, leaving the stubble of almost an even height; or, if it rise on either side, forming what are called swath-bulks, the butts of the swaths are suffered to rest upon them, the heads or ears of the corn falling into the hollow or close mown part of the preceding swath-width. They are of course liable in a we season not only to receive an undue portion of rain wate but to be fouled with the splashings of heavy showers. But that in the Kentish practice, which is said to excel those of other districts, the position of the swaths is different. Here the heads of the corn rest on the top of the swath-bulk, provincially the *beever*, which is left of extraordinary height, as ten to fifteen inches, so that the wind has a free circulation between the swaths. The workman, in performing this judicious operation, proceeds with his right foot forwards, entering the point of his scythe with a downward stroke, and rising it as abruptly out, bringing the handle round to the left until it forms nearly a right angle with the line of the swath, carrying the corn in the cradle three or four feet behind the place where it grew, lifting it high and letting it fall on the beever behind his left foot, and in the position above described. But the disadvantages of this metho are, the loss of some straw, the incumbrance arising from the length of the stubble, and a little additional labour: but in a district where cattle are not numerous, the loss of st aw is not felt; and in any country, the principle of laying the heads instead of the butts of the corn upon the swath-bulk, whether left high or low, might be well adopted.

Mucor; a genus of the class Cryptogamia, order Fungi.—Essential Generic Character. *Seeds:* naked, or in transparent capsules or vesicles at the end of the stem. These plants form the last genus of the lowest order of vegetation. They chiefly appear in the form of mouldiness on putrid or putrefying substances, as rotten wood, fruits, dung, corrupted food, old cheese, decayed leaves and other fungi, in caverns and arched cellars. The British species of Mucor, enumerated by Withering, are seventeen; to which several have been

added by other botanists, so that the species now amount to twenty-five.

Mudwort. See *Limosella.*

Mugwort. See *Artemisia.*

Muhlenbergia; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume one-valved, very small, emarginate, lateral. *Corolla:* two-valved; valves equal; outer lanceolate, long, acute, awned, embraced, the inner one hairy at the base; inner a little shorter, narrowed, linear, mucronate; nectary two-leaved; leaflets ovate, obliquely truncate, gibbous, small. *Stamina:* filamenta three, capillary, shorter than the corolla; antheræ linear. *Pistil:* germen ovate; styles two, capillary; stigmas feathered. *Pericarp:* none, except the corolla, which incloses the seed. *Seed:* one, oblong, acuminate. Essential Character. *Calix:* one-valved, minute, lateral. *Corolla:* two-valved.——The species are,

1. Muhlenbergia Diffusa. Culm branched, diffused, procumbent; leaves linear, lanceolate, somewhat rugged, nerved, three of the nerves thicker on the back of the leaf, so that it seems to be three-nerved. It is a perennial grass, native of North America.

2. Muhlenbergia Erecta. Culm firm, simple; leaves pubescent; panicles loose; calix bivalve; awn very long. It flowers in July, and grows in dry shady woods from Canada to Carolina.

Mulberry Tree. See *Morus.*

Mule's Tongue. See *Asplenium.*

Mullein. See *Verbascum.*

Mullera; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, compressed, truncated and flattish at the base, four-toothed; the upper tooth obliterated, very seldom cloven; the lateral ones more remote, acute, the lowest more produced and more awl-shaped. *Corolla:* papilionaceous; banner reflex, cordate, ovate, quite entire, obtuse, flat; claw flattish, scarcely longer than the calix, remote from the wings and keel; wings oblong, converging, gibbous at the base, clawed; keel shorter than the wings, composed of two distinct, converging, clawed petals forming an oblong, compressed, straight sheath. *Stamina:* filamenta ten, united into a compressed sheath, broader at the base; antheræ ovate. *Pistil:* germen linear, compressed; style short; stigma acute. *Pericarp:* fruit necklace-form, composed of three, four, or five concatenated, solid, one-celled, one-valved, one-seeded globules, the lowest of which are larger. *Seeds:* solitary, compressed, kidney-form, smooth. Essential Character. *Pericarp:* elongated, fleshy, necklace-form, with one-seeded globules.——The only known species is,

1. Mullera Moniliformis; *Beaded Mullera.* This is a tree, with ferruginous somewhat warted branches; leaves alternate, pinnate, having two pairs of leaflets with an odd one at the end; flowers scattered, nodding, the size of Laburnum flowers. This plant has a near affinity to *Sophora*; but it differs from it in having the stamina properly diadelphous, and the fruit not leguminous, or opening longitudinally by two valves. It has its name from the manner in which the fruit hangs, joined in a long row like a necklace or rosary.—Native of Surinam.

Munchhausia; a genus of the class Polyadelphia, order Polyandria.—Generic Character.. *Calix:* perianth one-leafed, half six-cleft, turbinate, torulose, permanent, with blunt segments. *Corolla:* petals six, obovate, spreading, clawed, inserted into the calix. *Stamina:* twenty-four or thirty, capillary, shorter than the petals, collected into six bodies; antheræ kidney-form. *Pistil:* germen superior, ovate; style filiform, declining, of a middling length; stigma blunt. *Pericarp:* capsule ovate, acuminate, six-celled. *Seeds:* very many. Essential Character. *Calix:* six-cleft, torulose. *Petals:* clawed. *Stamina:* in six bodies, four or five in each. *Pistil:* superior, with a filiform curved style.——The only known species is,

1. Munchhausia Speciosa. This is a small tree, with alternate, patulous, round, smooth branches; leaves alternate, ovate or ovate-oblong, acuminate, quite entire, smooth, paler underneath, on very short petioles; flowers alternate, on very short peduncles, extremely handsome.—Native of Java and China.

Muntingia; a genus of the class Polyandria, order Monogynia.—Generic Character. Perianth one-leafed, five-parted, concave at the base; segments lanceolate, acuminate, large, deciduous. *Corolla:* petals five, roundish, spreading, inserted into the calix. *Stamina:* filamenta very many, capillary, very short; antheræ roundish. *Pistil:* germen globular, clothed with villose hairs; style none; stigma headed, pentagonal, rayed, permanent; according to Gærtner, pyramidal, five-grooved, sessile. *Pericarp:* berry globular, umbilicate with the stigma, five-celled. *Seeds:* numerous, roundish, very small, nestling. Essential Character. *Calix:* five-parted. *Corolla:* five-petalled. *Berry:* five-seeded; (Gærtner says, many-celled.) *Seeds:* many, nestling.——The only known species is,

1. Muntingia Calabura; *Villose Muntingia.* This shrub or small tree rises from a fathom to ten or twelve feet; or, according to Sloane, thirty feet in height, sending out many irregular, spreading, long, round, hoary branches; leaves alternate, flat, spreading horizontally, oblique, ovate-lanceolate; petioles short, round, hirsute; peduncles two to four, between the petioles, and not axillary, clustered, longer than the petiole, shorter than the leaf, one-flowered, round, villose-viscid. Jacquin remarks, that they successively turn the flower when it is about to expand to the face of the leaf, which before was reflexed to the back of it. The flowers are without scent, but handsome; about an inch in diameter, resembling those of the Bramble. The fruit is of a dark purple colour when ripe.—Native of Jamaica, on the calcareous subalpine hills, flowering in the spring; and of St. Domingo, in the wet parts of woods, flowering in August and September. It is propagated by seeds sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanner's bark, raising the glasses to admit fresh air in warm weather. The seeds will often remain in the ground a whole year before the plants will appear; in which case the pots must be constantly kept clear from weeds, and should remain in the hot-bed till after Michaelmas, when they may be removed into the stove, and plunged into the bark-bed, between other pots of tall plants, and remain there during the winter season. These pots should be now and then watered, when the earth appears dry; and in the beginning of March the pots should be removed out of the stove, and placed in a fresh bark-bed under frames, which will bring up the plants soon after. When the plants are two inches high, they should be carefully taken out of the pots, and each planted into a separate pot, filled with light rich earth, and then plunged into the hot-bed again, observing to shade them from the sun until they have taken new root, after which time they should be duly watered, and in warm weather they must have a large share of fresh air. In this hot-bed the plants may remain until autumn begins to be cold; they should then be removed into the stove, and plunged into the bark-bed. It will be proper to continue these plants all the year in the stove, but in warm weather they should have a large share of fresh air; but as the plants grow in strength, they will be more hardy, and may

be exposed in summer for two or three months, and in winter will live in a dry-stove, if kept moderately warm.

Murraya; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, very small; segments linear, erect, roundish, remote, permanent. *Corolla:* five petalled, bell-shaped, petals lanceolate, spreading at the top. Nectary bell-shaped, short, encircling the germen. *Stamina:* filamenta ten, awl-shaped, the length of the flower; antheræ somewhat oblong. *Pistil:* germen roundish, superior; style filiform, subangular, longer than the stamina; stigma flattish, warted, angular. *Pericarp:* berry somewhat pulpy, one-celled. *Seed:* one, large, obovate, acute, grooved on one side. Essential Character. *Calix:* five-parted. *Corolla:* bell-shaped, with a nectary encircling the germen. *Berry:* one-seeded.——The only known species is,

1. Murraya Exotica; *Ash-leaved Murraya.* This very small tree, about six feet high, has a white bark, and the appearance of Schinus. It flowers in August and September.—Native of the East Indies.

Musa; a genus of the class Polygamia, order Monœcia.—Generic Character. *Hermaphrodite flowers,* more towards the base of the simple spadix, separate in alternate spathes. *Calix:* spathe partial, ovate-oblong, plano-concave, large, many-flowered. *Corolla:* unequal, ringent; the petal constituting the upper lip, but the nectary the under lip; petal erect, ligulate, truncate, five-toothed, converging in front at the base; nectary one-leafed, cordate, boat-shaped, compressed, acuminate, spreading outwards, shorter than the petal, inserted within the sinus of the petal. *Stamina:* filamenta six, awl-shaped, five of which within the petal are erect, the sixth within the nectary is reclining; antheræ linear, from the middle to the top fastened to the filament; but most frequently there is only one antheræ on the sixth filament, and very small ones or none on the rest. *Pistil:* germen very large, obtusely three-sided, very long, inferior; style cylindric, erect, the length of the petals; stigma headed, roundish, obscurely six-cleft. *Pericarp:* berry fleshy, covered with an husk, obscurely three-sided, or six-sided, gibbous on one side, one-celled, hollow in the middle. *Seeds:* very many, nestling, subglobular, wrinkled, tubercled, excavated at the base, or only rudiments. *Males* on the same spadix, above the hermaphrodite flowers, separated by spathes. *Calix, Corolla,* and *Nectary,* as in the hermaphrodites. *Stamina:* filamenta as in the hermaphrodites, equal, erect; antheræ as in the hermaphrodites, on the filament placed within the nectary, most frequently very small, or none. *Pistil:* germen as in the hermaphrodites, but less; style and stigma as in them, but less and more obscure. *Pericarp:* abortive. *Observe.* Most of the stamens abortive in some flowers, the pistils in others. Essential Character. *Calix:* spathe partial, many-flowered. *Corolla:* two-petalled; one petal erect, five-toothed, the other nectariferous, concave, shorter. *Stamina:* six. *Style:* one. All the flowers hermaphrodites. *Male Hermaphrodite:* above; five filamenta perfect; germen inferior, abortive. *Female Hermaphrodite:* one filamenta only perfect. *Berry:* oblong, three-sided, inferior, many-seeded.——The species are,

1. Musa Paradisiaca; *Plantain Tree.* Spadix nodding; male flowers permanent; fruit oblong. It rises with a soft herbaceous stalk fifteen or twenty feet high, and upwards: the lower part of the stalk is often as large as a man's thigh, diminishing gradually to the top, where the leaves come out on every side; they are often more than six feet long and two feet broad, with a strong fleshy midrib, and a great number of transverse veins running from the midrib to the borders. The leaves are thin and tender, and are often torn by the wind. The flowers come out in bunches from the centre of the leaves; the spike is often four feet in length, and nods on one side. Each of the bunches is covered with a spatha or sheath of fine purple colour within, which drops off when the flowers open. The upper part of the spike is made up of male or barren flowers, which are not succeeded by fruit. The fruit is eight or nine inches long, and above an inch in diameter, a little incurved, and has three angles; it is at first green, but, when ripe, of a pale yellow colour. The skin is tough, and within is a soft pulp of a luscious sweet flavour. The spikes of fruit are often so large as to weigh upwards of forty pounds.—Native of the East Indies; but cultivated generally between the tropics. In the West Indies the fruit is generally used when full grown, but before it ripens; it is commonly roasted, and is thus distributed among the negroes, by whom it is mostly used, though many of the whites prefer it to any of the bread kind, especially whilst young and tender. The negroes generally boil it with other messes, as salt-fish, beef, pork, pickle, or crabs, and find it a hearty wholesome food. As the fruit ripens, it becomes soft and sweetish, and is then generally made into tarts, or sliced and fried with butter. The Spaniards dry and preserve it as a sweetmeat. The ripe fruit with maize forms the best food for hogs put up to fat, and gives them a most exquisite flavour and firmness. The fruit of some of the numerous varieties is eaten raw in the South Sea Islands, and others are roasted or baked, according to their qualities. The trees which bear the former are the chief ornaments of the gardens in Otaheite; the latter are in the mountainous tracts of the islands that are covered with woods. This fruit is easy of digestion, very wholesome and agreeable to seamen after a long voyage: to many persons however its clammy sweetness is unpleasant; and it is reputed not to agree with weak stomachs, but to bring on a constipation and flatulency in the bowels. Rumphius is of opinion, that whether crude or mature, this fruit, running readily into putrescence, increases the malignity of the humours in the epidemic dysentery. On thrusting a knife into the body of the plant, the astringent limpid water that issues out, is given with great success to persons subject to a spitting of blood, and in fluxes. The leaves are used to dress blisters; and when dried, are made into mats, or employed to stuff matrasses.—*Propagation and Culture.* In Europe, some of these plants have been preserved, and have borne fruit in capacious hot-houses; but as they are very tall and large, few persons can spare sufficient room in their stoves. They are propagated by suckers, which come from the roots of those plants which have fruited; and many times the younger plants, when they are stinted in growth, will put out suckers; these should be carefully taken off, preserving some fibres to their roots, and planted in pots filled with light rich earth, and plunged into the tan-bed in the stove; these may be taken off any time in summer, and it is best to take them off when young, because if their roots are grown large, they do not put out new fibres so soon, and when the thick part of the root is cut in taking off, the plants often rot. During the summer season, these plants must be plentifully watered, for the surface of their leaves being large, there is a great consumption of moisture by perspiration in hot weather, but in the winter they must be watered more sparingly, though they should then be often refreshed in small quantities. The pots ought to be large in proportion to the size of the plants, for their roots generally extend pretty far, and the earth should be rich and light. The degree of heat with which these plants thrive best is much the same with the Anana, or Pine Apple. The

most sure method to obtain fruit in England is, after they have grown for some time in pots, so as to have made good roots, to shake them out of the pots with the ball of earth to their roots, and plant them into the tan-bed in the stove, observing to lay a little old tan near their roots for their fibres to strike into, and in a few months the roots of these plants will extend themselves many feet each way in the bark; and these plants will thrive a great deal faster than those which are confined in pots or tubs. When the bark-bed wants to be renewed with fresh tan, there should be great care taken of the roots of these plants, not to cut or break them, as also to leave a large quantity of the old tan about them; because if the new tan is laid too near them, it will scorch their roots, and injure them. These plants must be plentifully supplied with water, otherwise they will not thrive; in winter they should be watered twice a week, giving at least two quarts to each plant, but in summer they must be watered every other day, and double the quantity given to them each time. If the plants push out their flower-stems in the spring, there will be hopes of their perfecting their fruit; but when they come out late in the year, they will sometimes decay before the fruit ripens. The stoves in which these plants are placed should be at least twenty feet in height, otherwise there will not be room for their leaves to expand; for when the plants are in vigour, the leaves are often eight feet in length, and two feet broad: so that if the stems grow to be fourteen feet to the division of the leaves, and the house is not twenty feet high, the leaves will be cramped, and retard the growth of the plants; besides, when the leaves are bent against the glass, there will be danger of their breaking them, when they are growing vigorously. This tree is cultivated with great care in all our sugar colonies. It thrives best in a cool, rich, moist soil, and is commonly planted in regular walks or fields: it is propagated by the shoots, and planted at convenient distances; but as the root throws up a number of young shoots every year, the spaces between the first plants are left pretty considerable. When the fruit is ripe, the stem decays gradually, and the root begins to throw up young shoots. The stem is then usually cut down near the root, to give a stronger and quicker growth to the new plants. In the South Sea Islands, they put some wood ashes and burnt plants with a little shell-lime into the hole, when they plant the Musa; by which they so accelerate the growth, as to have fruit in six and even four months, whereas in the common course it is eighteen months before fruit is expected.

2. Musa Sapientum; *Banana Tree.* Spadix nodding; male flowers deciduous; fruit ovate. This tree differs from the preceding in having its stalks marked with dark purple stripes and spots. The fruit is shorter and rounder, with a softer pulp of a more luscious taste. A very excellent drink is made from the juice of the ripe fruit fermented, most resembling the best Southam cider. A marmalade is likewise made of it, esteemed an excellent pectoral, cooling and refreshing. This fruit has been noted for its efficacy in correcting those sharp humours which generate or accompany the fluxes to which Europeans are often subject on their first coming into the West Indies. The roasted fruit would be an useful sea-store, would keep a long time packed in dry leaves, and stowed in tight casks; and would only require to be roasted or heated afresh when wanted for use. This and the Plantain are among the greatest blessings bestowed by Providence upon the inhabitants of hot climates. Three dozen Plantains are sufficient to serve one man for a week instead of bread, and will support him much better. For the propagation and culture of the Banana, see the preceding species.

3. Musa Troglodytarum. Spadix erect; spathes deciduous; stem four feet high, an inch in thickness; leaves linear, three feet long, and five inches wide; berry scarlet, ovate, compressed, two inches long, not eatable.—Native of the Moluccas.——There are may varieties of the Plantain and Banana. Rumphius has noted sixteen, growing in the Molucca islands.

Muscus, or *Moss,* was formerly supposed to be only excrescences produced from the earth, trees, &c. but now known to be plants no less perfect than those of greater magnitude. They are ranged by Linneus in the second order of his twenty-fourth class, entitled *Cryptogamia Musci:* but so much having been done to his hands on the subject of this order by Dillenius, he did but little more than arrange the species, and give them specific characters. Linneus has three divisions of the Mosses.—1. Without any Calyptre or Veil, containing the following genera; *Lycopodium, Porella, Sphagnum.* 2. Calyptred, diclinous, or having the males and females separate; *Splachnum, Polytrichum, Mnium.* 3. Calyptred, monoclinous, or having the males and females on the same plant; *Phascum, Bryum, Hypnum, Fontinalis, Buxbaumia.* Since the time of Dillenius and Linneus, great light has been thrown upon this obscure order by Jacquin, Hoffman, Wiegel, Batsch, Pollich, Weis, Ehrhart, Schmidel, Schreber, Dickson, Withering, Stackhouse, but especially by Hedwig; according to this last author, Mosses are vegetables in which the female parts of fructification are furnished with a veil-like petal, bearing a style. He divides them into two orders: 1. *Frondosi.* Capsule entire, lidded, and opening transversely. 2. *Hepatici.* Capsule with four valves, opening lengthwise. The latter are not ranged with the *Musci,* but with the *Algæ,* by Linneus. These definitions of Hedwig exclude the Lycopodia from the Mosses.—Generic Character of *Mosses. Male flowers. Calix:* common, of many leaves; leaflets in structure resembling those of the plant, but generally broader, sometimes coloured, open and expanding like the rays of a star, or the petals of a full-blown rose, or else closing and approaching like a bud. A few have no appearance of a calix. *Corolla:* none. *Stamina:* numerous, within the common calix, mostly separated by succulent threads or chaff-like substances: sometimes uniting so as to form a little knob, or placed in the axils of the upper branches; filamentum short, filiform; antheræ sometimes cordate or ovate, but mostly cylindrical, one-celled, opening at the top, and discharging granulated pollen. *Female Flowers:* on the same or a different plant, sometimes intermixed with the males. *Calix: Perichætium* many-leaved; leaflets various, generally inclosing several pistils intermixed with succulent threads. *Corolla:* veil cylindrical, or conical, investing the germen and fixed to its top, united at the base to the sheath of the peduncle, but not elsewhere attached. *Pistil:* germen cylindrical or conical; style slender, standing on the veil; stigma truncate. *Pericarp:* capsule on a peduncle sheathed at the base; when unripe crowned by the veil which separates at its base, adhering to the point of the capsule, but falling off when that becomes ripe. The capsule then opens horizontally, the lid separating. *Lid:* with or without a ring, single or double; outer cartilaginous, sometimes swollen, or else contracted at the base, forming a kind of excrescence called *Apophysis.* Mouth of the capsule either naked, or closed with an outer fringe, with from four to thirty-two teeth, which are upright or reflected, straight or twisted, triangular, spear-shaped, or bristle-shaped, sharp or blunt; inner fringe finer, either closely adhering to the outer, or joined to it by threads from its inner side, or loose and unconnected, or fixed to the pedicle on its little bulb;

mouth naked, or covered with a membrane or network of the inner fringe, or variously jagged, or closed by distinct and regular teeth; column extending from the base to the point of the capsule, filiform, straight, passing through the lid into the style, and often giving the lid a pointed appearance. *Seeds:* numerous, minute, spherical, smooth, or rough. *Habit:* stems leafy; leaves membranaceous, reticulated, after being dried reviving when soaked in water.—*Observations.* If *Bryum, Pomiforme, Subulatum* of Haller, *Trichoides*, and a few others, be excepted, Mosses bear the stamina and pistilla in separate flowers, either on the same, or on distinct plants. The time of flowering generally coincides with that of the fruit attaining maturity, as happens in other evergreen perennials. Thus in *Polytrichum urnigerum; Mnium fontanum, hornum, punctatum, undulatum; Bryum trichoides, cæspititium*, &c. the veils fall off early in the spring, and the seed is scattered abroad; whilst at the same time the less obvious unimpregnated germina, and the male or staminiferous flowers, are performing their respective functions. This circumstance caused these ripe capsules to be mistaken for antheræ, and the seeds for pollen. Both male and female flowers are furnished with an involucre, which gives the outward figure to the flower, and is called the *Perichætium.* It varies more, and is more to be attended to, in the male than in the female flowers. The radiated disks of the Polytrichums and Mniums are very remarkable, and the scales composing them differ in many respects from the other leaves. The heads which put forth from the extremities of the Bryums have been hitherto unnoticed, though they contain the parts of fructification, and are composed of leaflets or scales different both in shape and size from the stem-leaves. Thus in *Bryum rurale* they are not terminated by hairs, and are shorter than the stem-leaves: in *Bryum pellucens, scoparium, heteromallum, aciculare*, &c. they are broader than the other leaves, and more hollow at the base: where the disklike substances form a kind of bud, as in almost all the *Hypnums, Bryum extinctorium, subulatum, pulvinatum, hypnoideum*, &c. they are much smaller than the leaves; they are also concave, ovate, or spoon-shaped, and destitute of the hairs which are on the real leaves. These therefore are truly the calix, and as they include the florets with stamina only, they may be called the Perichætiums of the male florets. On those Mosses which bear female flowers or capsules, the leaves adjoining to the peduncle are much more beautiful than those on the stems: but sometimes the inner leaves become gradually smaller, and those nearest to the flowers so very minute, that without a microscope it is not possible to dissect them away, so as to expose the flower. These therefore are to be considered as the involucres of the female flowers surrounding and embracing the germen.—*Male*, or staminiferous flowers. The antheræ are almost universally cylindrical, either straight or crooked; but in *Sphagnum palustre* and *Mnium androgynum* they are ovate, and more or less tapering to a point. Their colour is a very dilute green, almost white. When viewed under the highest magnifiers, and strongly illuminated by reflected light, they are found to contain a granulated substance; but their tops are very pellucid, and this pellucid part expands into a rising vesicle at the time the pollen is about to be discharged; the top then opens, and the pollen is ejected, the space from which it issues becoming more transparent. This pollen, when evacuated, seems to explode in the drop of water in which these observations are to be made. Beside the antheræ included within the same involucre, are some very delicate succulent bodies of various shapes. In Polytrichum and Mnium some of the barren florets are like disks, others like roses; and some like stars, when in a fully expanded state. In the Stellated Polytrichums, the scales are placed in concentric circles. In *Mnium hornum, palustre, fontanum*, &c. they are more like a rose or disk. After the pollen is dispersed, these roses or stars become more expanded; but previous thereto they are generally so open as to admit a view of the parts they contain. In some Mosses the flowers terminate the branches, and in such, though a little open, they are not enough so, to allow a sight of the antheræ until the flowering be past. Some florets are like buds, and sit in the bosom of the leaves; others in the imbricated thickened termination of the branches, as in *Sphagnum. Female flowers.* These are furnished with a germen, style, and stigma; but being accompanied by other substances much resembling them, they are difficult to be distinguished until the germen begins to swell in consequence of its impregnation. The pistils after impregnation daily growing larger, and rising upwards, shew the calyptra, or veil, which may be considered as a kind of petal, and is perforated at the top by the style. This style is sometimes permanent, falling off only with the veil itself; but where it is not so, the remains of it are always to be found. It is evident, from what has been said, that what Linneus calls the antheræ, are really the seed-vessels: but by sowing the seeds which they contain, a crop of young plants has been repeatedly procured, in all respects similar to their parents. The capsules of Mosses are always supported upon a peduncle, though sometimes it is very short, and, excepting only in *Sphagnum palustre*, it is sheathed and conical at its base. The capsules vary in shape, size, and consistence. In some species there is an elastic ring between the capsule and the veil, which, when the seed is ripe, throws off the veil with more or less force. The veil being thrown off, certain fringe-like processes or projections appear, varying greatly in size, shape, structure, number, and disposition: they surround the opening of the capsule in a single or double, rarely in a triple series. These substances constitute the *Peristoma* or *Fringe*, which seems designed to defend the seeds in wet weather. In dry weather it expands and leaves the mouth of the capsule open, but upon the least moisture, even that of the breath, it closes again. The seeds of the Mosses are sphericals, generally smooth, sometimes dotted, as in *Bryum extinctorium;* sometimes prickly, as in *Bryum pyriforme* and *heteromallum.* They are brown, yellowish, or greenish. Some of the above observations being made with very high magnifiers, are to be received with some degree of caution. Mosses thrive best in barren places; most of them love cold and moisture.—*Uses.* Trifling and insignificant as they are generally supposed to be, their uses are by no means inconsiderable. They protect the more tender plants when they first begin to expand in the spring, as the experience of the gardener can testify, which attaches him to cover with moss the soil and pots which contain his tenderest plants; for it equally defends the roots against the scorching sun-beams and the severity of the frost. In the spring particularly, the roots of young trees and shrubs are liable to be thrown out of the ground, especially in light spongy soils: but if they are covered with moss, this accident never can happen. They who raise trees from seed, will find an interest in attending to this remark. Mosses retain moisture a long time without being disposed to putrefy. The angler takes advantage of this circumstance to preserve his worms, and the gardener to keep moist the roots of such plants as are to be transported to any considerable distance. It is a vulgar error to suppose that Mosses impoverish land. It is true they grow upon poor land which can support nothing; but their roots penetrate very little, in general hardly a quarter of an inch into the earth. Take away the

Moss, and instead of more grass, there will be less; but if the land be drained and manured, the grass will increase and the Moss disappear. *Sphagnum palustre, Mnium triquetrum, Bryum paludosum* and *æstivum, Hypnum cæduncum, Scorpioides riparium* and *cuspidatum*, grow upon the sides and shallower parts of pools and marshes; in process of time occupying the space heretofore filled with water, they are in their half-decayed state dug up, and used as fuel, under the name of Peat. These marshes, drained partly by human industry, and partly by the long-continued operations of vegetables, are at length converted into fertile meadows. Very few Mosses are eaten by cattle; a few moths feed upon some of them. For their medicinal virtues, see *Lichen*. It is probable, on account of their astringent properties, that some of them might be worth trying as a substitute for oak-bark in tanning leather. Moss is most apt to fix itself upon the surface of old grass lands of the meadow and pasture kinds, in which it produces much injury by drawing away the nourishment of the grass plant, and of course lessening in a high degree the grassy herbage. It affects such as are of the clayey moist description, in cold exposed situations, most frequently choaking the grass by spreading closely over it. Various means have been proposed by writers on husbandry for the removal of this destructive vegetable, which, as it requires a considerable proportion of superficial moisture to promote its growth and extension on the soils which it infects, it is probable that the application of such substances as have a tendency to absorb and take up the superabundant degree of wetness by which it is supported, must be of great utility and advantage. In this view, lime has been applied evenly over the surface, in such cases, with much benefit. Superior advantages have however been obtained by covering mossy grass lands with a thin even coat of attenuated calcareous matter, in union with a sandy material, such as is scraped up from roads, when formed into a compost with about one fourth part of well-rotted farm-yard dung; as by this application a new and more vigorous description of grasses is brought up, which soon overpowers the Moss plants, and thus wholly destroys them. For the same purpose, and at the same time, promoting the improvement of the lands, as well as bringing the herbage into a finer state, the penning or folding of sheep has been advised. This will probably succeed best either in the close of the summer season, or early in the spring months; the latter is however to be preferred, as, from the grass immediately covering the surface, more effect may be produced in smothering the mossy vegetation. In this practice, advantage is obtained different ways; as, by the effect which the treading has in opening and removing the close netted texture of the Moss, and that of the urine and dung in promoting the growth of the grass plants. Harrowing with short, sharp-tined, light harrows, is likewise a practice that may be found useful in some cases, especially previous to the application of such substances or composts as have been just mentioned, as by such means the matted nature of the Moss is broken down, and rendered more open and fit for admitting the manure to the roots of the grass plants, and exerting their full influence in promoting its vigorous growth, and at the same time the spreading of the Moss is in some measure prevented. After such harrowings have been performed, some have recommended it as an advantageous practice to sow grass seeds, and especially white clover, over the surface. Different sorts of implements have been contrived for dressing the swards of grass lands when in this condition; such as the above harrow, different sorts of scarifiers and sward cutters; but it may be very conveniently performed by a sward dresser not long since invented by Mr. Amos, in his *Minutes on Agriculture and Planting*, which tool should be in the hands of all farmers where grass husbandry is much practised. All old grass lands, when much overrun with Moss, ought certainly to be broken up for the purpose of tillage, in order to their being laid down again to grass after a proper course of crops; as it is probably impossible to render them good grass lands by any other process; and in most instances this mode of proceeding would produce great improvement. Though very injurious to plants, Mosses, as has been already observed, are applied to a variety of useful purposes. The Moss of common trees, as oak, ash, poplar, &c. is used for caulking of vessels; and by bird merchants to prepare cages for the incubation of certain birds. The soft marsh and bog Mosses serve the poor in many places for stuffing their beds; and in the transportation of plants from one climate to another, nothing is so serviceable as the stalks and leaves of these little vegetables; the succulent plants arriving in great vigour and beauty from foreign countries, when rolled up in dry Moss: trees and shrubs also are preserved by having their roots covered with such as is somewhat moist. The great quality of the Mosses, which makes them so useful on these occasions, is, that they do not heat and ferment on being moistened, as hay and straw would. Several of the Mosses are great and valuable medicines, used as desiccatives and astringents; the Common Cup Moss is one of the greatest remedies in the convulsive coughs of children, see *Lychen Pyxidatus;* and Dr. Mead has ennobled the Lichen Caninus, or Grey Ground Lichen, by publishing its virtues in one of the most terrible of all diseases, the bite of a mad dog. The Common Green Liverworts are known medicines in disorders of the breast, as are also all the species of Polytricha. The seeds of our Lycopodium are successfully given in nephritic cases; and the Indians give one of their species in many distempers, and, as they say, with great benefit. The Common White Ground Corolloides serves the reindeer of Lapland for food, when all other herbage is lost; and the Confervæ serve for food to many of the fish both of the sea and rivers, and to several water-fowl; and these, as well as the land Mosses, afford shelter and habitation to many insects and their young. Many of the species of Corolloides and Lichnoides are found of great use in that profitable branch of commerce, the art of dyeing; and doubtless many others have also the same qualities, though not yet discovered; and we may be guided in searches of this kind by observing that many of them tinge the papers between which they are dried with very beautiful and lasting colours.—The Genera of Linneus have been split into several others by Hedwig and the other reformers. *Hypnum* and *Bryum* were indeed so unwieldly, that it was very desirable they should be divided. The genera of Mosses, as they stand in Schreber, are, *Phascum, Sphagnum, Gymnostomum, Tetraphis, Octoblepharum, Splachnum, Grimmia, Encalypta, Dicranum, Trichostomum, Didymodon, Tortula, Weissia, Pohlia, Funaria, Bryum, Timmia, Meesia, Bartramia, Fontinalis, Hypnum, Leskea, Neckera, Buxbaumia, Polytrichum.* See their characters under those names.—Other Mosses were placed by Linneus in his order of Algæ; they are now separated from that, and form a distinct order, under the name of Hepaticæ. In these, the *Female* fructifications are inclosed in a veil, which splits open at the top, and discharges the capsule. The *Capsule* opens lengthwise, and is filled with numerous *Seeds*, fixed to an elastic cord, formed of one or two spiral threads. Some plants are referred to this subdivision on account of their agreement in general habit, though the female fructification has no veil, but is placed upon or immersed in the substance of the leaf: the leaves are mostly

lobed, exhibiting a net-work of vesicles, and though dried reviving again when moistened with water. Hedwig observes, that all the female florets have a double calix, or a calix and corolla. In shape and structure, he says, they greatly resemble the proper Mosses, but that he never found the succulent threads: the pistil-like substances are however found, accompanying both the germen and ripened capsule; but not in all the species. The capsule, like those of the true Mosses, is inclosed in a veil, to which the style adheres; but this veil is not, as in them, loosened at its attachment, and raised along with the growing capsule; it tears open in two, three, or four places, and has therefore been sometimes considered as a petal. All these Mosses agree in ripening their fruit, which is raised upon an elongated peduncle, and opens by four valves, filled with the seeds, attached to elastic cords. These seeds have been found to reproduce their respective plants. The genera comprehended under this subdivision of the Mosses, are *Anthoceros, Blasia, Jungermannia, Marchantia, Riccia, Sphærocarpus, and Targionia.*

Mussænda; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth superior, five-parted, unequal; leaflets linear, acuminate, permanent. *Corolla:* one-petalled, funnel-form; tube long, filiform, hirsute; border five-cleft, equal; segments ovate. *Stamina:* filamenta five, the length of the corolla, growing to the tube on the inside; antheræ linear, bristle-shaped, long within the tube. *Pistil:* germen inferior, ovate; style filiform; stigmas two, simple, thickish. *Pericarp:* berry oblong, crowned. *Seeds:* numerous, in four parcels. Essential Character. *Corolla:* funnel-form; stigmas two, thickish. *Berry:* oblong, inferior. *Seeds:* disposed in four rows. There are eleven species, of which the following are a specimen:

1. Mussænda Frondosa. Panicle with coloured leaves. This is a large, woody, climbing shrub, without tendrils or thorns, having many long scattered branches; leaves ovate-lanceolate, quite entire, wrinkled, hairy, subsessile, opposite; flowers gold-coloured, in large, spreading, terminating cymes, with large, ovate, nerved, very white, petioled bractes.—Native of the East Indies and Cochin-china; and Otaheite and Namoka islands in the South Seas.

2. Mussænda Glabra. Branches and leaves of the branches and panicle very smooth.—Native of the East Indies. The Malays call it *Daunputri.*

3. Mussænda Chinensis. Leaves in bundles; flowers solitary. This is a small tree, with diffused unarmed branches.—Native of China.

4. Mussænda Citrifolia. Leaves three, in a whorl, ovate, nearly sessile; calix teeth long and permanent.—Native of Madagascar; where it is called *Charra.*

Mustard. See *Sinapis.*

Mustard, Hedge. See *Erysimum* and *Sisymbrium.*

Mustard, Mithridate. See *Thlaspi.*

Mustard, Tower. See *Turritis.*

Mustard, Treacle. See *Clypeola* and *Thlaspi.*

Mutisia; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common oblong, cylindric, imbricate; scales lanceolate; the inner ones longer. *Corolla:* compound radiate; corollets of the disk three times more than of the ray, hermaphrodite; of the ray, eight female; proper of the hermaphrodites tubular, trifid; the outer segment lanceolate, the inner segments linear. *Female:* oval, oblong, entire, with a linear claw. *Stamina:* in the hermaphrodites, filamenta five, linear; antheræ cylindric, longer than the floret, with decurrent bristles at the base; in the females none, but only the rudiments of two filamenta. *Pistil:* germina short; style filiform; stigma in the hermaphrodites simple; in the females two, bristle-shaped. *Pericarp:* none. *Seeds:* somewhat oblong. *Down:* feathered. *Receptacle:* naked. Essential Character. *Calix:* cylindric, imbricate; corollets of the ray oval-oblong, of the disk trifid. *Down:* feathered. *Receptacle:* naked. ——Of this genus there are eleven species, divided into those with pinnate and those with simple leaves, all natives of South America; the first only of which we shall describe:

1. Mutisia Clematis. This is a climbing plant, like *Clematis:* when young, tomentose all over; stem shrubby, striated, long, branched, twining; flowers the size and form of a pink; corolla purple, the length of the ray of the calix itself.

Myagrum; a genus of the class Tetradynamia, order Siliculosa.—Generic Character. *Calix:* perianth four-leaved; leaflets ovate-oblong, concave, gaping, coloured, deciduous. *Corolla:* four-petalled, cruciform; petals flat, roundish, blunt, with narrow claws. *Stamina:* filamenta six, the length of the calix, of which the four opposite are a little longer; antheræ simple. *Pistil:* germen ovate; style filiform, the length of the calix; stigma blunt. *Pericarp:* silicle obcordate, compressed a little, entire, rigid, terminated at top by the rigid conic style, two-valved; some of the cells often empty. *Seeds:* roundish. Essential Character. Silicle terminated by a conical style, with a cell commonly one-seeded.—If the seeds of these plants be permitted to scatter, in the autumn the plants will rise without any care, and only require to be thinned and kept clean. ——The species are,

1. Myagrum Perenne; *Perennial Gold of Pleasure.* Silicles two, and jointed, one-seeded; leaves outwardly sinuate, toothletted. The lower leaves are large, jagged, and hairy, the stalks, which branch out from the bottom, are terminated by very long loose spikes of yellow flowers, succeeded by short pods with two joints, each including one roundish seed.—Native of Germany.

2. Myagrum Orientale; *Oriental Gold of Pleasure.* Silicles grooved, even; leaves oblong, tooth-sinuate. Annual.—Native of the Levant.

3. Myagrum Rugosum; *Wrinkled Gold of Pleasure.* Silicles grooved, hairy, wrinkled; leaves oblong, blunt, toothed. The lower leaves are five or six inches long; they are hairy and succulent, their base is eared, and they end in acute points. The stalks are a foot and a half high, brittle, and hairy, branching out towards the top, and terminated by short loose spikes of small pale flowers, which are succeeded by small, rough, roundish capsules, compressed at the top.—Native of the south of Europe.

4. Myagrum Hispanicum; *Spanish Gold of Pleasure.* Silicles even, somewhat swelling; leaves lyrate; stem rugged, with scattered reflex hairs; racemes rod-like, long; corolla yellow. Biennial.—Native of Spain.

5. Myagrum Austriacum; *Austrian Gold of Pleasure* Silicles roundish, smooth; leaves oblong, embracing; root creeping. The whole of this plant is smooth; the stems subangular, herbaceous, erect, branchy, leafy, and about a foot or a cubit high; flowers yellow, on corymbose, terminal racemes, stretching gradually to two or three inches.—Native of Austria, in clayey ground, flowering in June.

6. Myagrum Perfoliatum; *Perfoliate Gold of Pleasure.* Silicles obcordate, subsessile; leaves embracing. It has a smooth branching stalk upwards of two feet high. The lower leaves are five or six inches long, smooth, succulent, and a little indented; the upper leaves almost embrace the stalks with their base. The flowers are produced in long loose spikes, are yellow and sessile; they appear in June and July.

—Native of the south of France and Switzerland; and, according to Miller, in Italy.

7. Myagrum Sativum; *Cultivated Gold of Pleasure.* Silicle obovate, peduncled, many-seeded. An annual plant: stalk upright, a foot and half high, sending out two or four side-branches towards the top, which grow erect. The lower leaves are from three to four inches long, of a pale yellowish green, and eared at the base; those upon the stalks diminish in size all the way up, are entire, and almost embrace the stalk with their base. The flowers grow in loose spikes at the ends of the branches, standing upon footstalks an inch long; petals small, yellowish; silicles oval, bordered, crowned with the style, two-celled; the cells filled with red seeds. There are several varieties. It is cultivated in Germany for the sake of the expressed oil of the seeds, which is there used for medicinal, culinary, and economical purposes. The seeds are a favourite food with geese; horses, cows, sheep, and goats, eat the plant.—Native of Germany and the southern countries of Europe; found in corn, and especially in flax fields, with the seed of which it has been introduced into the more northern parts, as Sweden, Denmark, and Britain. It has been found near Bridport and Lyme in Dorsetshire; and at Heydon in Norfolk.

8. Myagrum Paniculatum; *Panicled Gold of Pleasure.* Silicles lens-shaped, orbiculate, dotted, wrinkled. Root small, annual, fusiform, white within and without, four inches long; stem erect, two feet high and more, somewhat angular and rugged, having one or two alternate branches at the upper part, both terminated by a loose lougish raceme; leaves alternate, eared, embracing, hirsute on both sides, the lower four inches long, and an inch wide; corolla small, yellow. It flowers in July and August.—Native of Europe.

9. Myagrum Saxatile; *Rock Gold of Pleasure.* Silicles lens-shaped, obovate, smooth; leaves petioled, oblong, serrate, rugged; stem panicled. Root perennial, long, brown; root-leaves many, spread out into a ring, oblanceolate, (orbiculate or oblong,) gradually attenuated into the petiole, blunt, unequally, obscurely, and thinly toothed, thickish, slightly rough, less than an inch in length, deep green; calix yellowish white; petals white, spreading very much, twice as long as the calix, roundish; style short; silicles almost globular. There are several varieties of this species. It flowers in June and July.—Native of the mountains of France, Italy, Austria, and Switzerland.

10. Myagrum Ægyptium; *Egyptian Gold of Pleasure.* Silicles angular; leaves three-parted. Stem divaricated, with rod-like racemes; flowers yellow; style very short.—Native of Egypt.

11. Myagrum Argenteum. Plant tomentose on every side; pouches oblong, pedunculate, tomentose; leaves linear-spathulate, sensibly attenuate, very entire; petals obovate; flowers yellow.—Found upon the banks of the Missouri. The whole of the plant has some resemblance to Alyssum Saxatile.

Myginda; a genus of the class Tetrandria, order Tetragynia.—Generic Character. *Calix:* perianth four-parted, very small, permanent. *Corolla:* petals four, roundish, flat, spreading very much. *Stamina:* filamenta four, awl-shaped, erect, shorter than the corolla; antheræ roundish. *Pistil:* germen roundish; styles four, erect, short; stigmas acute. *Pericarp:* drupe globular. *Seed:* nut, ovate, acute. Essential Character. *Calix:* four-parted. *Petals:* four. *Drupe:* globular.——The species are,

1. Myginda Uragoga. Leaves subcordate, acuminate, subserrate, pubescent. This is an upright shrub, divided into few branches, on sandy shores three feet high, in woods eight feet; root thick, knobbed, irregular; the bark brown without, orange within; the wood solid, whitish, very bitter; flowers small, of a dark shining red; fruit red, soft, and the size of peas. The Spaniards call it *Yerva de Maravedi* A decoction or infusion of the root is often employed as a powerful diuretic; the leaves have the same quality in a much smaller degree.—At Carthagena, in New Spain, and on the sea-coast of the island of St. Martin, it is found in abundance.

2. Myginda Rhacoma. Leaves lanceolate-ovate, obtuse, crenate; flowers monogynous; style four-cleft. This is an upright branching shrub, from two to three feet in height, with an ash-coloured bark. In habit it resembles the preceding, but has smaller ovate leaves, and an undivided style.—Native of Jamaica, flowering in summer, on the western sandy coast.

3. Myginda Latifolia. Leaves elliptic, crenulate, subcoriaceous; stigmas two to four, sessile. This also is an upright branching shrub, three or four feet high; branches scattered, four-cornered, smooth; peduncles shorter than the leaves, axillary, few-flowered; pedicels one-flowered; flowers very small, whitish.—Native of the West Indies.

Myoporum; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments ovate, acute, erect, permanent. *Corolla:* one-petalled, bell-shaped; border spreading, almost equal, five-parted. *Stamina:* filamenta four, two shorter; antheræ vertical, arrow-shaped. *Pistil:* germen oblong, compressed; style cylindrical, curved; stigma capitate. *Pericarp:* berry, one-celled. *Seeds:* one or two, two-celled. Essential Character. *Calix:* five-parted. *Corolla:* bell-shaped, with a spreading, almost equal, five-parted border. *Berry:* one or two seeded. *Seeds:* two-celled.——Fourteen species, natives of New Holland, have been discovered, besides the following:

1. Myoporum Lætum. Leaves oblong, subserrate at the tip, even, smooth, shining; corollas hirsute.—Native of New Zealand.

2. Myoporum Pubescens. Leaves oblong, elliptic, serrate, pubescent.—Native of New Zealand.

3. Myoporum Crassifolium. Leaves oblong, subserrate, fleshy.—Native of Botany Island in the South Seas.

4. Myoporum Tennifolium. Leaves lanceolate, acuminate, quite entire; corollas smooth and even.—Native of New Caledonia.

Myosotis; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth half five-cleft, oblong, erect, acute, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindric, short; border half five-cleft, flat; segments emarginate, blunt, opening, closed with five convex, prominent, converging scalelets. *Stamina:* filamenta five, in the neck of the tube, very short; antheræ very small, covered. *Pistil:* germina four; style filiform, the length of the tube of the corolla; stigma blunt. *Pericarp:* none; calix larger, erect, cherishing the seeds in its bosom. *Seeds:* four, ovate, acuminate, smooth. Essential Character. *Corolla:* salver-shaped, five-cleft, emarginate; the opening closed with arches.—To propagate the grasses of this genus, sow the seeds in autumn, upon an open bed or border of light earth. In the spring, thin the plants where they are too close, and keep them clean. Or, if the seeds be permitted to scatter, the plants will rise without further trouble.——The species are,

1. Myosotis Scorpioides; *Mouse-ear Scorpion Grass.* Seeds smooth and even; tips of the leaves callous. Stems several, procumbent, ascending or erect, a long span or a foot high; leaves alternate, quite entire, bent back a little at the edge, apparently veinless; flowers in racemes, whilst young bend-

ing at the top, from which it derives the name of Scorpion-grass, from its resemblance to the tail of a scorpion; calix villose, deeply five-cleft, closing at top as the seeds ripen; corolla red before it opens, but when open of a fine blue, with a yellow eye, not more than a tenth or twelfth of an inch in diameter. There are many varieties of this plant, occasioned by the different situations in which it grows: on walls, heaths, and barren pastures, it grows only to a very small size.

2. Myosotis Fruticosa; *Shrubby Scorpion Grass.* Seeds smooth and even; stem shrubby, smooth and even, a foot high, woody, perennial; branches many, flowering at the top; leaves alternate, linear, almost even, with a few hairs pressed close; spikes terminating, with the flowers pointing one way, not peduncled; flowers and fruits minute.—Native of the Cape.

3. Myosotis Virginiana; *Virginian Scorpion Grass.* Seeds with hooked prickles; leaves ovate-oblong; branches divaricating. Annual.—Native of Virginia.

4. Myosotis Lappula; *Prickly-seeded Scorpion Grass.* Seeds with hooked prickles; leaves lanceolate, hairy. Stem from nine or ten inches to eighteen inches in height, erect, round, somewhat rugged; branches alternate; flowers very small; corolla bright blue. Annual.—Native of Sweden, Denmark, Germany, France, Switzerland, and Italy.

5. Myosotis Spinocarpos; *Thorny-seeded Scorpion Grass.* Seeds muricate-spiny; racemes leafy, with the flowers remote; leaves linear, hairy. Stems woody at the base, diffused, dichotomously branched at top, closely hairy, ash-coloured, as is the whole plant; flowers small and white.—Native of most of the countries in Europe.

6. Myosotis Apula; *Small Scorpion Grass.* Seeds naked; leaves hispid; racemes leafy. Roots reddish, annual; stems simple, or branched, a span high; flowers in terminating racemes, recurved at the end; corolla deep sulphur-coloured. —Native of the south of Europe, as in France, Spain, and Italy; also in Japan. It flowers in April.

7. Myosotis Spatulata; *Spatula-leaved Scorpion Grass.* Seeds smooth and even; leaves spathulate-hispid; peduncles axillary, solitary, one-flowered.—Native of New Zealand.

8. Myosotis Australis; *New Holland Scorpion Grass.* Hispid: leaves oblong-lanceolate; calix as long as the tube, clothed with spreading hooked bristles. Plant eighteen inches high; flowers numerous, small, blue.—Found at Port Jackson and Van Diemen's Land.

Myosurus; a genus of the class Pentandria, order Polygynia.—Generic Character. *Calix:* perianth five-leaved; leaflets half-lanceolate, obtuse, reflex, annexed above the base, coloured, deciduous. *Corolla:* petals five, shorter than the calix, very minute, tubular at the base, opening obliquely inwards; (according to Gærtner, with a nectariferous pore at the claws.) *Stamina:* filamenta five, or more, (Gærtner says, five to twelve,) the length of the calix; antheræ oblong, erect. *Pistil:* germina numerous, placed on the receptacle in a conic-oblong form; styles none; stigmas simple. *Pericarp:* none; receptacle very long, style-shaped, covered with the seeds disposed imbricately. *Seeds:* very numerous, oblong, acuminate. *Observe.* The number of stamina varies very much. The genus bears a near affinity to *Ranunculus.* What are here called petals, Linneus terms awl-shaped petal-like nectaries. Essential Character. *Calix:* five-leaved, growing together at the base. *Petals:* five; or *Nectary* five, awl-shaped, resembling petals, having a melliferous pore at the claw. *Seeds:* numerous, five to twelve.——The only known species is,

1. Myosurus Minimus; *Mouse-tail.* Root annual, fibrous, small; leaves all radical, about twenty in a plant, of a middling size, upright, of unequal lengths, linear, broadest at top, flattened, faintly channelled on each side, smooth, somewhat fleshy, blunt, of a yellowish green colour, and reddish at the base. Scapes or flowering stems four, five, or more, each supporting one flower; petals of a yellowish colour. This plant affords a rare instance of a very great disproportion of males to females in the same flower, yet the latter are all generally prolific. Mr. Curtis observes, that the structure of the whole fructification in this delicate little annual plant, is singular, and deserving the attention of the young botanist, who should be careful to distinguish the corolla from the stamina.—It grows wild in most parts of Europe, and is often found by the side of corn-fields and on moist grounds.

Myrica; a genus of the class Diœcia, order Tetrandria.——Generic Character. *Male. Calix:* ament ovate-oblong imbricate on all sides, loose, composed of one-flowered, crescent-shaped, bluntly acuminate, concave scales; perianth proper, none. *Corolla:* none. *Stamina:* filamenta four, (seldom but sometimes six,) filiform, short, erect; antheræ large, twin, with bifid lobes. *Female. Calix:* as in the male. *Corolla:* none. *Pistil:* germen subovate; styles two, filiform, longer than the calix; stigmas simple. *Pericarp:* berry, one-celled. *Seed:* single. *Observe.* There is a great affinity between this genus and *Pistacia.* Essential Character. Ament with a crescent-shaped scale; corolla none. *Female.* Styles two; berry one-seeded.——The species are,

1. Myrica Gale; *Sweet Gale, Sweet Willow,* or *Candleberry Myrtle.* Leaves lanceolate, subserrate; stem suffruticose. It rises with many shrubby stalks, from two to nearly four feet high, dividing into several slender branches, and covered with a dusky or rust-coloured bark, sprinkled with white dots; leaves convoluted and petioled, alternate, stiff, an inch and half long. The flowers appear before the leaves, and the flower-buds are above the leaf-buds at the end of the branches. The fruit is a coriaceous berry. The leaves have a bitter taste, and an agreeable odour, like those of Myrtle. Their essential oil rises in distillation. The northern nations formerly used this plant instead of Hops, and it is still in use for that purpose in some of the Western Isles, and a few places of the Highlands of Scotland. Unless it be boiled a long time, it is reported to occasion the head-ach. The catkins or cones boiled in water throw up a scum resembling bees-wax, which, gathered in a sufficient quantity, would make candles. It is used to balk calf-skins. Gathered in autumn, it dies wool yellow, and is used for that purpose both in Sweden and Wales. The Swedes sometimes employ a strong decoction of it to kill bugs and lice, and to destroy the itch. They lay branches of it upon and under their beds, to keep off fleas and moths; and give it as a vermifuge in powder and infusion, applying it also externally to the abdomen. In most of the Hebrides, as well as the Highlands of Scotland, an infusion of the leaves is frequently given to children to destroy worms. In Isla and Jura the inhabitants garnish their dishes with it, and lay it between their linen and other garments, to give them a fine scent, and to defend them from the moth. When it grows near a sea-port, sailors make besoms of it for sweeping their ships. In the Isle of Ely, they make faggots with it to heat their ovens. From the smell of this shrub, Linneus was induced to suspect that camphor might be obtained from it. Horses and goats eat it; sheep and cows refuse it. So little was the Tea-shrub known formerly, that it was once asserted to be the same plant with our Gale.—Native of the northern parts of Europe, and of North America in bogs: in England it flowers in May, and is common in the northern and western counties; also in Windsor

Park, and near Tunbridge Wells; in the fens of the Isle of Ely; about Wareham in Dorsetshire; between Shap and Anna Well in Westmoreland. It has the names of Sweet Gale, Goule, Sweet Willow, Wild Myrtle, and Dutch Myrtle. The Scotch call it Gaul, and the Irish, Moss-Gaul. The Germans and Dutch call it *Pors* or *Post;* and the French, *le Gale odorant, le Piment royal,* &c. This plant cannot be cultivated in a garden without bog-earth in a moist situation, for it is a native of bogs, and cannot live in any other soil.

2. Myrica Cerifera; *American Candleberry Myrtle.* Leaves elliptic, lanceolate, subserrate; stem arborescent. Male aments compound; drupe with a four-celled nucleus. This shrub attains the height of thirty feet; the bark is warted; the branches unequal and straight; flowers in aments, on different individuals; berry minute, roundish, yellow. There are two varieties: the narrow-leaved and the broad-leaved. In North America, candles are prepared from the berries, whence the plant is called the *Tallow-shrub,* or *Candleberry Tree;* and also the *Bayberry bush.* It grows abundantly on a wet soil, and seems to thrive particularly well in the neighbourhood of the sea, being seldom found high up in the country. The berries intended for making candles are gathered late in autumn, and are thrown into a pot of boiling water; their fat melts out, floats at the top of the water, and may be skimmed off: when congealed, it looks like tallow or wax, but has a dirty green colour; it is therefore melted again, and refined, by which means it acquires a fine and pretty transparent green colour. It is dearer than common tallow, but cheaper than wax. They usually mix some tallow with it. Candles of this kind do not easily bend or melt in summer, as common candles do; they burn better and slower, nor do they cause any smoke, but rather yield an agreeable smell when they are extinguished. At present not many candles of this kind are used; the animal tallow is readily come at, while it is very troublesome to gather the berries. They are chiefly used by poor people, who live near where the bushes grow, and have not cattle enough to supply them. A soap is made from the fat, which has an agreeable scent, and is excellent for shaving; and it is used by surgeons for plasters. In Carolina likewise, they make sealing-wax from these berries; and the root is accounted a specific in the tooth-ach.—This plant is propagated by seeds sown in autumn, for if they are kept out of the ground till the spring, they seldom grow till the year after. They require water in dry weather, and should be screened from frost whilst young. When they have obtained strength, they will resist the cold of this country very well, and will thrive on a moist soft soil.

3. Myrica Faya; *Azorian Candleberry Myrtle.* Leaves elliptic-lanceolate, subserrate; male aments compound; drupe with a four-celled nucleus. It flowers in June and July.—Native of Madeira and the Azores.

4. Myrica Æthiopica; *African Candleberry Myrtle.* Leaves lanceolate or elliptic, toothed, the lowest entire.—Native of the Cape of Good Hope. As this, and the seventh, eighth, and ninth species, do not produce seeds in England, they are propagated by layers. When the layers are laid down, that part of the shoot which is laid should be tongued at a joint, as is practised in laying Carnations; and the young shoots only should be chosen for this purpose. The best time for doing this is in July. These layers are often two years before they will have taken root enough to transplant, for they should not be separated by the old plants till they have made good roots, because they are very subject to miscarry if they are not well rooted. When they are taken off from the old plants, they should be each put into a separate small pot, filled with soft, rich, loamy earth; and if they are placed under a common frame, shading them from the sun in the middle of the day, it will forward their taking new root; then they may be placed in a sheltered situation during the summer, and in autumn removed into the greenhouse, and treated in the same way as other plants from the same country.

5. Myrica Montana; *Mountain Candleberry Myrtle.* Leaves lanceolate, serrate, not dotted underneath; aments globular. This is a shrub, with round smooth branches.

6. Myrica Nagi; *Japonese Candleberry Myrtle.* Leaves lanceolate, entire, veinless. Stem shrubby, smooth, upright; branches decussated, round, spreading very much, leafy.—Native of Japan.

7. Myrica Quercifolia; *Oak-leaved Candleberry Myrtle.* Leaves oblong, oppositely sinuate. Stalks slender, shrubby, about four feet high, dividing into smaller branches. This species retains its leaves all the year. It flowers in June and July, and is a native of the Cape.

8. Myrica Cordifolia; *Heart-leaved Candleberry Myrtle.* Leaves cordate, serrate, sessile. Stalk weak, shrubby, five or six feet high, sending out many long slender branches, closely garnished their whole length with small heart-shaped leaves, sitting close to the branches, which continue all the year green. The flowers come out between the leaves in roundish bunches.—Native of the Cape.

9. Myrica Trifoliata; *Three-leaved Candleberry Myrtle.* Leaves ternate, toothed.—Native of the Cape.

10. Myrica Pennsylvanica. Leaves oblong, very entire; male aments loose; squames acute; berries globose.—It grows in shady rocky situations in New Jersey and Pennsylvania, and is about three feet high.

Myriophyllum; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flowers. Calix:* perianth four-leaved; leaflets oblong, erect; outmost larger, inmost less. *Corolla:* none. *Stamina:* filamenta eight, capillary, longer than the calix, flaccid; antheræ oblong. *Female Flowers,* below the males. *Calix:* perianth as in the male. *Corolla:* none. *Pistil:* germina four, oblong; styles none; stigmas pubescent. *Pericarp:* none. *Seeds:* four, oblong, naked. *Observe.* The first species sometimes, and the second often, has hermaphrodite flowers. Essential Character. *Calix:* four-leaved. *Corolla:* none, (or, according to Gœrtner, two-petalled,) *Male. Stamina:* eight. *Female. Pistil:* four; style none. *Seeds:* four, naked: (Gœrtner says, stigmas two or four, sessile; nuts two or four, corticated.)——The species are,

1. Myriophyllum Spicatum; *Spiked Water Milfoil.* Spike interrupted, leafless. Stem branched; leaves in whorls under water, pinnate; pinnas capillary, deep green; flowering spike rising above the water, bearing six or eight whorls of sessile flowers; the upper male, somewhat crowded; the lower female, more distant.—Native of most parts of Europe, in still water, as ditches, ponds, and lakes. It flowers from May to July. There is also a variety which is more branched, has smaller spikes, and broadish entire leaves at the base of the whorls.—Found near Loddon bridge, not far from Reading; also in the river on Hounslow Heath.

2. Myriophyllum Verticillatum; *Whorled Water Milfoil.* Flowers in leafy whorls. Stems simple, six or eight inches high; leaves not more than an inch long, with pinnas one and a half or two lines in length.—It flowers in June and July, and is an inhabitant of ditches and stagnant waters, but not found so extensively as the other, and less common in Britain. With us it has been observed in two or three places near Cambridge; by the bridge on the Botley road; near the lane going to Medley, in Oxfordshire; near Bungay in

Suffolk; near Yarmouth, and at Hedenham, in Norfolk; and in the river near Peterborough.—It flowers in June and July.

Myristica; a genus of the class Diœcia, order Monadelphia, or, according to Swartz, of class Monadelphia, order Triandria.—Generic Character. *Male. Calix:* perianth one-leafed, coriaceous, trifid; segments ovate, acute. *Corolla:* none. *Stamina:* filamentum one, columnar, cylindric, erect, shorter than the calix; antheræ three to ten, linear, connate, growing round the upper part of the filamentum. *Female,* on a distinct tree, (or on the same trunk, or on different trees, according to Lamark and Jussieu.) *Calix:* perianth as in the male, deciduous. *Corolla:* none. *Pistil:* germen superior, ovate; style very short; stigma bifid; segments ovate, spreading. *Pericarp:* capsule drupaceous, fleshy, roundish, one-celled, at length two-valved, bursting earlier on one side; aril between the pericarp and the nut, somewhat fleshy, oily, subdivided into longitudinal segments. *Seed:* nut, roundish, one-celled, valveless, with a thin shell; nucleus roundish, variegated with flexuose curvatures. Essential Character. *Calix:* trifid. *Corolla:* none. *Male. Filamentum:* columnar. *Antheræ:* terminating, united. *Female. Capsule:* superior, drupaceous, two-valved. *Nut:* involved in an aril called the *Mace.*——The species are,

1. Myristica Aromatica; *Aromatic* or *True Nutmeg Tree.* Calices ovate, trifid at the top; leaves elliptic, pubescent underneath; fruits even. This is a large tree, with erect branches, and a smooth ash-coloured bark; the inner bark is red; fruit a superior berry, fleshy, rather solid, finally drying up into a coriaceous crust, opening on one side, containing one seed (which is the *nutmeg,*) arilled: this aril, or cover, is what is called the *mace.* The leaves are aromatic, and if the trunk or branches be wounded, they yield a glutinous red liquor.—This tree is a native of the East Indies, and especially of the island of Banda: and is thus described by Sir George Staunton. The Nutmeg Tree rises with a smooth brown bark, perfectly straight. Its strong and numerous branches proceed regularly in an oblique direction upwards. They bear large oval leaves pendulous from them, some a foot in length; the upper surface smooth, and of a deep agreeable green, the under surface marked with a strong nerve along the middle, from which others proceed obliquely: it is of an uniform bright brown colour, as if strewed all over with a fine brown powder, and the whole leaf is very fragrant.—The king of France's gardener at the Isle of Bourbon, in 1779, distinguished the Nutmeg Trees into three sorts. 1. The male or barren Nutmeg. 2. The Royal Nutmeg, or female, producing the long nuts. 3. The Queen Nutmeg, yielding the precious round nuts, intended to reproduce the females, but which gives separately, the one long nuts, intended to give males, the other round nuts, intended to produce the two sorts of females; namely, that producing the long, and that producing the round nut. The only difference between the Royal and Queen Nutmeg is in the fruit. That of the Royal is thicker, longer, and more pointed; the green shell is thicker, and is longer in ripening: the green shell after its opening preserves its freshness for eight or nine days: the Mace is more substantial, and three or four times as long as that of the Queen Nutmeg; and its stripes or thongs, of which there are from fifteen to seventeen principal ones, are of a livelier red; they are also broader, longer, and thicker, and not only embrace the nuts throughout its whole length, but pass it, and cross under it, as if to hinder it from falling. The Royal Nutmeg is generally from fifteen to sixteen lines long, thick in proportion, and has no longitudinal stripe. It remains on the tree a long time after the opening of the green shell, and gives birth to insects in the shell that feed upon it. The Queen Nutmeg produces much smaller nuts, only nine or ten lines long, not so thick by a third, and well marked by a longitudinal groove on one side; they are round, and resemble a small peach; the green shell is not so thick: the Mace, which is composed of nine or ten principal stripes, grows only half down the nut, leaving it at liberty to escape and plant itself. By thus detaching itself, the nut prevents the insects from destroying it; the green shell also changing at the end of two or three days, soon falls, and separates from the nut. This green shell, when preserved, has the fine taste of the nut itself.—The Nutmeg Tree has been introduced into the British territories in the E. and W. Indies; and a premium has been offered by the Society of Arts, Manufactures, and Commerce, of London, ever since the year 1783, for the greatest quantity of merchantable nutmegs, not less than five pounds weight, the growth of the West Indies; but, as far as we are informed, hitherto without success.—As the Nutmeg tree has not yet been introduced among us, we cannot give any particular directions for the stove culture of it. In its native soil it grows in woods, and seems to be propagated by birds. The Nutmeg is a moderately warm and grateful spice, and is supposed to be particularly useful in weakness of the stomach, loss of appetite, and those sicknesses and vomitings which usually accompany pregnancy. It is likewise excellent in violent purgings, but is liable, when taken in any quantity, to sit very uneasy at the stomach, and frequently affects the head. If, however, it is roasted in a gentle heat till it becomes quite friable, it proves less subject to those inconveniences, and is also much more serviceable in fluxes, and most other complaints to which it is adapted. The Mace has a pleasant aromatic smell, and a warm bitterish aromatic taste. It is in common use as a grateful spice, and appears to be, in its general qualities, very much like the Nutmeg, the greatest difference consisting in its being more bitter and less unctuous, and sitting more easily on weak stomachs. Oil of Mace, as it is generally called, though procured from the Nutmeg, is principally used externally in plaisters for the stomach, and in nervous and other ointments for easing pain. The distilled water is a good nervous medicine, or at least a good vehicle to take nervous medicines in.

2. Myristica Sebifera. Leaves cordate, oblong, tomentose underneath; fruits tomentose. This is a tree, from forty to sixty feet high, branching at the top; the branches are long, tortuous, upright, and declining; the flowers heaped, five or six, sessile. The fruit varies in size and form on different trees, being twice as large in some; it is oblong, the valves being produced into an obtuse cylinder. From the kernel is extracted a species of yellowish suet or fat, which serves for various medical and economical purposes; and is made into candles. The wounded bark emits a red acrid juice.—Native of marshy woods and hills in Guiana.

3. Myristica Fatua. Leaves oblong, lanceolate, pubescent underneath; calices and fruits villose. The nutmeg of this is aromatic, but occasions delirium and madness for a time.—Native of Tobago. Gœrtner has described three other species of this genus, all natives of Malabar and Ceylon, but they are not of sufficient importance to be here introduced.

Myrmecia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, long, five-toothed; toothlets erect, acute. *Corolla:* one-petalled; tube long, opening, inflated; border five-cleft; segments ovate, acute, revolute; nectary five small glands, surrounding the base of the germen. *Stamina:* filamenta four, filiform, inserted at bottom into the tube, and longer than it; antheræ linear, erect. *Pistil:* germen oblong, supe-

rior; style filiform, longer than the stamina; stigma bilamellate. *Pericarp:* capsule long, two-celled, two-valved, covered by the permanent calix. *Seeds:* numerous, very small, viscid, adhering to the partition. Essential Character. *Calix:* tubular, five-toothed. *Corolla:* one-petalled, with an inflated mouth, and five-cleft border. *Germen:* with five glands at the base. *Stigma:* bilamellate. *Capsule:* two-celled, two-valved, many-seeded.——The only known species is,

1. Myrmecia Tachia. This is a shrub, with a trunk of five or six feet in height, thick at the base, and gradually diminishing as it ascends: it throws out here and there long, rough, four-cornered branches, which are opposite and tubular; at each knot of these branches grow opposite leaves, disposed crossways: they are ovate, sharp, perfectly entire, smooth, subsessile, and embrace the stem. From the bosom of one or other of these leaves proceeds a sessile flower of a yellow colour. It generally happens that at the bosoms of those leaves which do not produce flowers, a tear of yellow resin makes its appearance. The hollow trunk and branches of this shrub are commonly the retreat of a great many ants; whence the natives call it *Tachi*, which in their language signifies an ant's nest.—Native of South America.

Myrodendrum; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-toothed, acute. *Corolla:* petals five, oblong, acute, spreading, much larger than the calix. *Stamina:* filamenta twenty, capillary, inserted into the receptacle; antheræ roundish. *Pistil:* german roundish, small, superior; style long, curved inwards, villose; stigma capitate, five-lobed. *Pericarp:* five-celled. *Seeds:* solitary. Essential Character. *Corolla*, five-petalled, spreading, much larger than the five-toothed calix. *Stigma*, capitate, five-lobed. *Pericarp*, five-celled, with one seed in each cell.——The only known species is,

1. Myrodendrum Balsamiferum. This tree is fifty or sixty feet high, and two feet in diameter; the bark thick, reddish, and rough; the wood hard and brown: it throws out from the top several large branches, which divide into branchlets beset with alternate, entire, smooth, green, firm, long leaves, terminating in a point; these leaves are largest at their base, where they partly embrace the branchlets: the young leaves are reddish, those of the young trees are six inches long and two broad. The flowers are borne in heads or clusters from the bosoms of the leaves at the extremities of the branchlets, and are of a white colour. The bark of this tree affords a red balsamic fluid, resembling Styrax in scent: this liquor, after it has exuded from the bark, becomes hard, brittle, and transparent, and, when burnt, affords a very agreeable odour. The negroes and the natives of Guiana use the bark for the purpose of slips to make flambeaux. The natives also use the wood in building their houses. The Creoles call the tree Red Wood, the others call it Houmiri and Touri. Aublet says the resin might be used medicinally, in the same manner as the balsam of Peru.

Myrodia; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth one-leafed, turbinate, urceolate, coriaceous, toothless, bursting at top into unequal teeth, permanent. *Corolla:* petals five, inserted into the receptacle, narrower below, oblong, oblique, blunt, from spreading recurved, longer than the calix. *Stamina:* filamenta uniting into a long slender tube, widening at top, plaited, five-toothed, sheathing the style; antheræ nine to fourteen, kidney-form, clustered towards the top of the tube, sessile. *Pistil:* german ovate, in the base of the calix: style filiforum, thickened at top, plaited, a little longer than the filamenta; stigma large, capitate, or two-lobed. *Pericarp:* drupe subglobular, dry, stupaceous, with a retuse top, umbilicate with the remains of the style, two or three celled. *Seeds:* solitary, angular on one side, convex on the other. Essential Character. *Calix*, simple, one-leafed. *Corolla*, five-petalled. *Antheræ:* undivided. *Drupe:* dry, inclosing two nuts.——The species are,

1. Myrodia Turbinata. Leaves elliptic; calices turbinate, somewhat silky within. This is a tree, from 30 to 50 feet high.—Native of the West Indies.

2. Myrodia Longiflora. Leaves oblong; calices cylindric, villose within; column of stamina very long. This is a shrub, about six feet high, with a trunk of three or four inches in diameter: the bark is grayish, and chapped; the wood white, and of a slight texture.—Native of Guiana.

Myrosma; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* perianth superior, double; outer three-leaved; leaflets equal, membranaceous, oblong, channelled, quite entire; inner three-parted; segments equal, spreading, oblong, quite entire, with a dusky spot at the top. *Corolla:* one-petalled, unequal; tube very short; border five-parted; the two upper segments shorter, oblong, unequally emarginate; the three lower longer, trifid at the top, and gashed; the middle one shorter. *Stamina:* filamentum one, free, or growing to the margin of the middle division of the lower segment of the corolla, membranaceous at the base, awl-shaped; antheræ ovate, compressed. *Pistil*, german three-sided, inferior; style thick, bent down, short, three-cornered, cloven longitudinally, hirsute before; stigma open, with the lip dilated. *Pericarp:* capsule three-celled, three-valved, three-cornered. *Seeds:* several, angular. Essential Character. *Calix:* double; outer three-leaved, inner three-parted. *Corollæ:* five-parted, irregular. *Capsule:* three-cornered, three-celled, many-seeded.——The only known species is,

1. Myrosma Cannæfolia. Root horizontal, ascending obliquely at top, fleshy, ovate, short, slightly compressed, as in Amomum, girt with rings, covered with alternate, embracing, ovate, appressed, broad, fibrous sheaths; leaves, oval, smooth, veined; stems or scapes round, somewhat hairy, ending in a joint; from the top of the stem arises a footstalk bearing eight or ten flowers, resembling the catkin of the Hop.—Native of Surinam.

Myroxylum; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-toothed, permanent, with very small obsolete teeth. *Corolla:* petals five, unequal, inserted into the receptacle; the uppermost wide, ovate, obcordate, reflex, the rest narrow, lanceolate, straight, scarcely spreading; claws narrow, linear, the length of the calix. *Stamina:* filamenta ten, filiform, smooth, pressed to the germen, the length of the calix; antheræ erect, lanceolate, grooved, terminating in a short point. *Pistil:* germen superior, longer than the flower, hanging down from it, sabre shaped, compressed; style ascending, short, filiform; stigma blunt, simple. *Pericarp:* legume sword-shaped, narrowed at the base, widening towards the top, ancipital, not opening. *Seed:* single, round, compressed, in the top of the legume. Essential Character. *Calix*, bell-shaped. *Petals*, five, the uppermost larger. *German*, stalked, longer than the corolla. *Legume*, one-seeded.——The only known species is,

1. Myroxylum Peruiferum; *Balsam Tree of Peru.* A very beautiful tree, with a smooth thick bark, which is very resinous, as indeed are all its parts. The leaves are alternately abruptly pinnate; leaflets in two pairs, mostly opposite, ovate-lanceolate, with the end produced blunt, emarginate. The

substance of the leaves is full of linear dots, which are transparent and resinous. The Balsam of Peru is the produce of this tree; which is found growing abundantly in open coppices, at the foot of the mountain De la Popæ, near Carthagena.

Myrsine; a genus of the class of Pentandria, order Monogynia.——Generic Character. *Calix:* perianth five-parted, small; leaflets subovate, permanent. *Corolla:* one-petalled, half five-cleft; segments half-ovate, converging, blunt. *Stamina:* filamenta five, scarcely visible, inserted into the middle of the corolla; antheræ awl-shaped, erect, shorter than the corolla. *Pistil:* germen subglobular, almost filling the corolla; style cylindric, longer than the corolla, permanent; stigma large, woolly, hanging on the outside of the flower. *Pericarp:* berry roundish, depressed, one-celled. *Seed:* (according to Gærtner) one, subglobular, fixed obliquely to the bottom of the berry. *Observe.* Unity is frequently subtracted in all parts of the fructification; the unripe berry has five seeds, but when ripe it has only one. Essential Character. *Corolla:* half-five-cleft, converging. *Germen:* filling the corolla. *Berry:* one-seeded, with a five-celled nucleus.——The species are,

1. Myrsine Africana; *African Myrsine.* Leaves elliptic, acute; flowers axillary, in threes, on short peduncles; corolla pale, with rugged testaceous dots, ciliate, closed. It flowers from March to May.—Native of the Cape.

2. Myrsine Retusa; *Round-leaved Myrsine,* or *Tamaja.* Leaves obovate, obtuse, emarginate, toothletted at top; berries the size of red currants: it resembles the first species very much, but is smaller.—Flowers in June; native of the Azores.

Myrtle. See *Myrtus.*

Myrtle, Candleberry. } See *Myrica Gale.*
Myrtle, Dutch. }

Myrtus; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four or five cleft, bluntish, superior, raised internally into a subvillose ring, permanent. *Corolla:* petals four or five, ovate, entire, large, inserted into the calix. *Stamina:* filamenta very many, capillary, the length of the corolla, inserted into the calicine ring; antheræ roundish, small. *Pistil:* germen inferior, two-celled or three-celled; the seeds fixed to the partition; style simple, filiform; stigma blunt. *Pericarp:* berry oval, umbilicated with the calix, one, two, or three celled. *Seeds:* few, kidney-form. Essential Character. *Calix:* five-cleft, superior. *Petals:* five. *Berry:* two or three celled. *Seeds:* several, gibbous. ——The species are,

1. Myrtus Communis; *Common Myrtle.* Flowers solitary; involucre two-leaved. Trunk irregular, branching, covered with a brown, rough, scaling bark; leaves ovate, or ovate-lanceolate, entire, smooth on both sides, dark green, paler underneath, opposite, and decussated; the flowers come out singly from the axils, and have a two-leaved involucre under them; corolla white: they flower in July and August. The principal varieties, according to Mr. Miller, are as follows: 1. The common Broad-leaved, or Roman Myrtle, so called from being found in the neighbourhood of Rome, grows to the height of eight or ten feet in England, but is much higher in Italy, where it is the principal underwood of some of the forests; the leaves are broader, the flowers larger, and the footstalks shorter, than most of the other varieties. Some call it the Flowering Myrtle, because it flowers more freely in England than the others. The woods between Leghorn and Pisa have Cork Trees for the timber, and this kind of Myrtle for the underwood. 2. The Box-leaved Myrtle, has the leaves oval, small, sessile, of a lucid green, and ending in obtuse points; the branches weak, and frequently hanging down, when permitted to grow without shortening; the bark is grayish; the flowers small, coming late in the summer, and the berries small and round. 3. The common Italian Myrtle, has ovate-lanceolate leaves, ending in acute points; the branches grow more erect than in either of the preceding, as also do the leaves; hence the gardeners call it the Upright Myrtle. 4. Orange-leaved, or, as it is sometimes called, Bay-leaved Myrtle, has a stronger stalk and branches, and rises to a greater height; the leaves are ovate-lanceolate, in clusters round the branches, and of a dark green; the flowers are of a mid dling size, and come out sparingly from between the leaves; the berries are oval and smaller than those of the first, and it is also less hardy. 5. The Portugal Myrtle, the leaves of which are much smaller than those of the next, being less than an inch long, and not more than half an inch broad, lanceolate-ovate, acute, of a dull green, and set pretty close in the branches; the flowers are smaller, the berries small and oval. 6. The Broad-leaved Dutch Myrtle has leaves much less than those of the common sort, and more pointed, standing close together on the branches; the midrib on the under side of the leaves is of a purple colour: they are of a darker green, and sit closer to the branches; the flowers are smaller, and on shorter peduncles, and they appear rather later than in the common sort. The Double-flowering Myrtle is probably a variety of this. 7. The Rosemary-leaved, or, as some call it, Thyme-leaved Myrtle, has the branches growing pretty erect; the leaves small, narrow, acute, sessile, and of a lucid green; flowers small, appearing late in the season. The above varieties, which Mr. Miller has considered as distinct species, are constant; there are others propagated for sale in the gardens and nurseries, which are less considerable and more variable, the names of which will be sufficient; they are, 1. Gold-striped Broad-leaved Myrtle. 2. Broad-leaved Jew's Myrtle, having the leeves frequently in threes, on which account it is said to be in esteem among the Jews in their religious ceremonies. 3. Gold-striped Orange-leaved Myrtle. 4. Silver-striped Italian Myrtle, 5. Striped Box-leaved Myrtle. 6. Silver-striped Rosemary-leaved Myrtle. 7. Silver-striped Nutmeg Myrtle. 8. Cock's-comb, or Bird's-nest Myrtle.—The Myrtle is a rare instance of the same name prevailing in the Greek and Latin, and all the modern European languages, with a very slight difference: the Germans call it *Myrte,* or *Myrterbaum;* the Dutch, *Myrtus;* the Danes, *Myrter;* the Swedes, *Myrtem;* the French, *le Myrte;* the Italians and Spaniards, *Myrto;* and the Portuguese, *Murta,* or *Myrta.* This shrub was a great favourite among the ancients, for its elegance and evergreen sweet leaves. It was sacred to Venus, and adorned the brows of bloodless victors, for myrtle wreaths were worn as symbols of authority by the Athenian magistrates. Both branches and berries were put into wine, and the latter were used for culinary purposes. Lewis observes, that they appear to be of a mild, restringent, and strengthening nature, and are recommended against all kinds of fluxes, and other disorders arising from relaxation and debility; they have a roughish, but not an unpleasant taste, accompanied with a degree of sweetness and an aromatic flavour; the leaves likewise possess considerable astringency, and yield, when bruised, a pretty strong aromatic smell. Hill also observes, that the leaves and berries of the Myrtle are cordial and astringent; and that a strong infusion of the former is good against slight purgings, and strengthens the stomach

Different Species of the Sensitive Plant from Vera Cruz

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and bowels at the same time that it removes the complaint; the leaves, dried and powdered, he adds, are good against the whites, and the berries are excellent in bloody fluxes, overflowing of the menses, and spitting of blood.——All the varieties of the Common Myrtle may be propagated from cuttings, the best season for which is the beginning of July, when some of the straightest and most vigorous young shoots should be chosen; they ought to be about six or eight inches long; the leaves on the lower part must be stripped off about two or three inches high, and the part twisted which is to be placed in the ground; then having filled a parcel of pots, in proportion to the quantity of cuttings designed, with light rich earth, plant the cuttings therein at about two inches' distance from each other, observing to close the earth fast about them, and give them some water to settle it to the cuttings; then place the pots under a common hot-bed frame, plunging them either into some old dung or tanner's bark, which will prevent the earth from drying too fast; but they must be carefully shaded with mats in the heat of the day, and have air in proportion to the warmth of the season, not forgetting to water them every two or three days, as you shall find the earth in the pots require it: with this management, in about six weeks the cuttings will be rooted, and begin to shoot, when they should be inured gradually to the open air, and removed into it about the latter end of August, or beginning of September, placing them in a situation where they may be sheltered from cold winds, in which place they may remain till the middle or latter end of October, when the pots should be removed into the green-house, but should be placed in the coolest part of it, that they may have air given to them in mild weather, for they all, except the Orange-leaved and the Striped Nutmeg Myrtles, which are tender and should have a warm situation, require only to be protected from severe cold. During the winter season, they must be frequently but gently watered; and if any decayed leaves appear, they should be constantly picked off, and the pots kept clear from weeds, which, if permitted to grow, will soon overspread the young plants and destroy them. If these pots are placed under a common hot-bed frame in winter, where they may be screened from frost, and have the free air in mild weather, the young plants will succeed better than in a green-house, provided they do not receive too much wet, and are not kept closely covered, which will occasion their growing mouldy, and dropping their leaves. The spring following, these plants should be taken out of the pots very carefully, preserving a ball of earth to the roots of each of them, and each one should be planted into a separate small pot, filled with rich light earth, observing to water them well to settle the earth to their roots, and place them under a frame till they have taken root; after which, they should be inured to the open air, and in May should be placed abroad for the summer, in a sheltered situation, where they may be defended from strong winds: during the summer they will require to be plentifully watered, especially being in such small pots, which in that season soon dry; they must therefore be placed where they will receive only the morning sun, for if exposed to the heat of the day, the moisture will be so soon exhaled, that it will greatly retard the plants in their growth. In August following, examine the pots to see if the roots of the plants have not made their way out through the hole in the bottom of the pots, in which case they must be shifted into those of a size larger, filling them up with the same kind of earth, and observing to trim the roots which were matted to the side of the pots, as also to loosen the earth from the outside of the ball with your hands, some of which should be taken off, that the roots may the more easily find passage into the fresh earth; then you must water them well, and place the pots in a situation where they may be defended from strong winds, and the plants may also be trimmed to reduce them to a regular figure, and if they are inclined to make crooked stems, thrust down a slender straight stick close by them, fastening their stems to it, so as to bring them upright. If care be taken to train them thus while they are young, when the stems have acquired strength, they will continue straight without any support, and their branches may be pruned so as to form balls or pyramids, which for such plants as are preserved in the green-house, and require to be kept in a small compass, is the best method to have them handsome; but then these sheered plants will not produce any flowers, for which reason that sort with double flowers should not be clipped, as its chief beauty is in the flowers; hence it will be necessary to suffer a plant or two of each kind to grow rude for the use of their branches in nosegays, &c. As these plants rise in height, they should be annually removed into larger pots, according to the size of their roots; but you must be careful not to put them into over large pots, which often causes them to shoot weak and die. When they are taken out of the former pots, the earth about their roots should be gently pared off, and that withinside the ball gently loosened, that the roots may not be too closely confined; and then place them into the same pots again, provided they are not too small, filling up the sides and bottom of them with fresh rich earth, with plenty of water afterwards to settle it to their roots; this watering should be frequently repeated, for they require it both in winter and summer, but especially in hot weather. The best season for shifting these plants is either in April or August; for if it be done much sooner in the spring, the plants are then in a slow-growing state, and so not capable to strike out fresh roots again very soon; and if it be done later in autumn, the cold weather coming on will prevent their taking root; nor is it advisable to do it in the great heat of summer, because they will require to be very often watered, and also to be placed in the shade, otherwise they will be liable to droop for a considerable time; and that being the season when these plants should be placed among other exotics to adorn the garden, after their removal, they should not be exposed until they have taken root again, which in hot and dry seasons will be in three weeks or a month. In October, when the nights begin to be frosty, they must be removed into the green-house; but if the weather in autumn proves favourable, they may remain abroad until the beginning of November; for if they are carried too soon into the green-house, and the autumn should prove warm, they will make fresh shoots at that season, which will be weak, and often grow mouldy in winter, if the weather should afterwards prove so severe as to require the windows to be kept closely shut, whereby they will be greatly defaced; for which reason they should always be kept as long abroad as the season will permit, and removed out again in the spring before they shoot out; and, during the winter season that they are in the green-house, they should have as much free air as possible when the weather is mild.—The common Broad-leaved Dutch and Portugal Myrtles may be planted abroad in warm situations, and upon a dry soil, where they endure the cold of our winter very well, with only being covered in very hard frosts with mats, and the surface of the ground about their roots covered with a little mulch, to prevent the frost from

entering the ground; but in Cornwall and Devonshire, where the winters are more favourable than in most other parts of England, there are large hedges of Myrtle which have been planted several years, and are very thriving and vigorous, and in some instances upwards of six feet high. If the double flowering kind were planted abroad, it would probably endure cold as well as any of the other sorts, it being a native of the southern parts of France. This and the Orange-leaved are the most difficult to take root from cuttings: but if they are planted towards the latter end of June, making choice of only such shoots as are tender, and the pots are plunged into an old bed of tanner's bark, which has lost most of its heat, and the glasses shaded every day, they will take root extremely well. The Orange-leaved, and those with variegated leaves, are somewhat more tender than the ordinary sorts, and should be housed a little sooner in autumn, and placed further from the windows of the green-house.

2. Myrtus, Tomentosa; *Woolly-leaved Myrtle.* Peduncles one-flowered; leaves triple-nerved, tomentose underneath; branches round, tomentose; flowers axillary, rose-coloured, an inch and half broad, with deep crimson stamens, and yellow anthers. The calix and stalks are delicately hoary; and the leaves soft and downy, of a hoary green. It flowers in June and July.—Native of China and Cochin-china. For the cultivation of this, and most of the species from warm climates, see the twenty-ninth species.

3. Myrtus Alpina; *Alpine Myrtle.* Peduncles solitary, terminating, one-flowered; leaves ovate; branchlets in fours, fastigiate; stem arboreous.—Native of Jamaica.

4. Myrtus Rocera; *Tall Myrtle.* Peduncles clustered, axillary, one-flowered; leaves ovate, acuminate, flat, smooth; branches rod-like; stem arboreous.—Native of Hispanolia.

5. Myrtus Ligustrina; *Privet Myrtle.* Peduncles solitary and branched, terminating, one-flowered; leaves lanceolate, blunt, convex, lucid.—Native of Hispaniola.

6. Myrtus Crenulata; *Notch-leaved Myrtle.* Peduncles solitary, axillary, commonly three-flowered; leaves roundish, crenulate, smooth.—Native of Hispaniola.

7. Myrtus Ceracina; *Cherry Myrtle.* Peduncles lateral, and terminating, one-flowered; leaves oblong, shining, dotted underneath. The whole of this shrub is smooth. The fruit has a very thin black skin, with a very small, purple, sweetish pulp, including two white stones, flat on one side, convex on the other, together making a sphere. It is so like a black cherry, that it is so called in Jamaica.—Native of the Caribbee Islands.

8. Myrtus Tenuifolia; *Fine leaved-Myrtle.* Peduncles axillary, solitary, one-flowered; leaves linear, mucronulate. This is an elegant little shrub; flower-stalks silky, shorter than the leaves, each bearing a small white flower, often tinged externally with red, and not unlike the Common Myrtle blossom, though hardly half so large.—Native of New South Wales.

9. Myrtus Brasiliana; *Brasilian Myrtle.* Flowers solitary; peduncles naked; petals subciliate; leaves ovate, obtuse, petioled, smooth.—Native of Brazil.

10. Myrtus Biflora; *Two-flowered Myrtle.* Peduncles two-flowered; leaves lanceolate. It rises with a divided trunk to the height of eight or ten feet, sending out many opposite branches, covered with a gray bark. As it retains its splendent green leaves all the year, it makes a good appearance; but the flowers being small, and growing thinly upon the branches, do not make any great figure.—Native of Jamaica.

11. Myrtus Trinervia; *Three-leaved Myrtle.* Peduncles axillary, three-flowered; leaves ovate, acuminate, three-nerved, tomentose underneath, large and handsome; flowers small.—Native of New South Wales.

12. Myrtus Angustifolia; *Narrow-leaved Myrtle.* Peduncles umbelled; leaves linear-lanceolate, subsessile. It is a small tree, with round branches, and square smooth twigs.—Native of the Cape.

13. Myrtus Lævis; *Smooth Myrtle.* Peduncles umbelled; leaves ovate, acuminate; stem shrubby, entirely smooth; branches and branchlets alternate, erect; flowers on the branchlets terminating in a single umbel.—Native of Japan.

14. Myrtus Lucida; *Shining Myrtle.* Peduncles subtriflorous; leaves subsessile, lanceolate, attenuated. The leaves are of a singular structure, being from ovate remarkably attenuated into a lanceolate top; flowers five-petalled.—Native of Surinam.

15. Myrtus Cumini. Peduncles many-flowered; leaves lanceolate, ovate; branches round, ash-coloured.—Native of the East Indies.

16. Myrtus Lineata. Flowers axillary, subsessile; leaves ovate, acuminate, rigid, marked with lines, hoary underneath.—Native of Hispaniola.

17. Myrtus Cordata; *Heart-leaved Myrtle.* Flowers axillary and lateral, subsessile; leaves sessile, cordate, ovate, shining; branches ash-coloured, smooth, as is the whole plant, compressed at top; flowers axillary, three or four, sessile on each side of the leafless branches.—Native of the West Indies.

18. Myrtus Pallens; *Ash-coloured Myrtle.* Racemes terminating, pubescent; pedicels one-flowered; leaves broad-lanceolate, attenuated, dotted above; branches round, ash-coloured, compressed a little at top.—Native of South America.

19. Myrtus Dumosa. Racemes axillary, very short; leaves petioled, broad-lanceolate, acuminate, acute; branches with a coated chinky bark.—Native of South America.

20. Myrtus Buxifolia; *Box-leaved Myrtle.* Racemelets very short, clustered, axillary; leaves wedge-shaped, oblong, blunt, somewhat convex.—Native of the West Indies.

21. Myrtus Glabrata; *Polished Myrtle,* Racemelets very short, axillary, many-flowered; leaves elliptic, acuminate, convex, coriaceous, very smooth.—Native of Hispaniola.

22. Myrtus Disticha; *Globe-berried Myrtle.* Peduncles axillary, many-flowered, shorter than the leaves; leaves distich, bent down, ovate-lanceolate; branches spreading. This is a shrub often six feet high. The negroes call it Wild Coffee, from a similar flavour in the seeds to the real coffee. The berry is the size of a black currant, of three or four cells, and as many seeds. It is a hardy stove plant, but of no great beauty.—Native of the West Indies. Found on the north part of Jamaica by Swartz.

23. Myrtus Monticola. Peduncles many-flowered, very short, axillary, solitary; leaves ovate, blunted, flat, very smooth.—Native of the West Indies.

24. Myrtus Axillaris. Peduncles many-flowered, very short, axillary, clustered; leaves ovate, acuminate, shining, flat.—Native of the West Indies.

25. Myrtus Gregii; *Round-leaved Myrtle.* Peduncles many-flowered, axillary; leaves ovate, elliptic, acute, quite entire, pubescent underneath.—Native of Antigua, Barbadoes, and Dominica.

26. Myrtus Dioica. Peduncles trichotomous-panicled; leaves oblong; flowers diœcous.—Native of America.

27. Myrtus Virgultosa. Peduncles axillary and terminating, panicled or racemed; leaves broad-lanceolate, attenuated.—Native of the West Indies.

28. Myrtus Splendens. Peduncles axillary, solitary, trichotomous; leaves elliptic, acuminate, flat, veined, scariose, shining; branches rod-like.—Native of Hispaniola.

29. Myrtus Zeylanica; *Ceylon Myrtle.* Racemes axillary and terminating; pedicels commonly four-flowered; leaves ovate, attenuated, dotted above. This has a strong upright stalk, covered with a smooth grey bark, dividing towards the top into many tender stiff branches. The flowers come out at the ends of the branches, several on one common peduncle, which branches out, and each flower stands on a very slender pedicel: they are very like the flowers of the Italian Myrtle.—Native of Ceylon. This plant is scarce, because it is difficult to propagate; for as it does not produce ripe seeds in Europe, it can only be produced by layers or cuttings. By the former method, the layers are commonly two years before they take root, and the cuttings frequently fail, though the latter is preferred when performed at a proper season and in a right method. The best time to plant the cuttings is in May: in the choice of them it should be the shoots of the former year, with a small piece of the two years' wood at bottom: these should be planted in small pots filled with soft loamy earth, for small pots are to be preferred before large ones for this purpose, and they should be plunged into a very moderate hot-bed of tanner's bark; and if the pots are each covered with small bell or hand glasses, such as have been used for blowing Carnations, to exclude the air, it will be of great service to promote the cuttings putting out roots, though they are covered with the glasses of the hot-bed above them; the cuttings should be shaded from the sun in the heat of the day, and gently refreshed with water as the earth in the pots dries, but they should by no means have too much wet: those cuttings which succeed will have taken root by July, when they should be gradually inured to bear the open air, into which it will be proper to remove them about the middle of that month, that they may be strengthened before winter; but it will not be proper to transplant the cuttings till spring; the pots must be removed into a temperate stove in autumn, and during the winter the cuttings must be gently refreshed with water. In the spring they should be carefully taken up, and each planted in a small pot filled with light earth from a kitchen-garden, and plunged into a moderate hot-bed, to forward their taking fresh root; then they should be gradually hardened, and in July placed in the open air in a sheltered situation, where they may remain till the end of September, and then be removed into the stove. This plant will not endure an English winter in a green-house, but if it is placed in a moderate degree of warmth, it will flower well in winter; and in July, August, and September, the plants should be placed abroad in a sheltered situation.—The other tender Myrtles from the East and West Indies may be treated in the same manner.

30. Myrtus Androsæmoides. Racemes axillary and terminating, subcompound; pedicels three-flowered; leaves ovate, oblong, sessile. The whole plant is smooth; branches obscurely four-cornered at top.—Native of Ceylon.

31. Myrtus Caryophyllata. Peduncles trichotomous, terminating; calices undivided; leaves ovate-lanceolate, undotted.—Native of Ceylon and other parts of the East Indies, but not of America.

32. Myrtus Acris. Peduncles axillary and terminating, corymbed, trichotomous, longer than the leaves; leaves elliptic, convex, coriaceous, veined, dotted. Stem arborcous; trunk handsome, straight, forming a very thick beautiful pyramidal head; bark in the younger trees brown, then ash-coloured, finally white entirely, or with large yellow spots; it is very smooth and even, especially in old trees, but here and there hangs down in slender shreds. The flowers are small and white, with a slight tinge of redness; berries round, the size of peas, crowned with the remains of the calix, having an aromatic smell and taste, which renders them agreeable for culinary purposes; they contain about seven or eight seeds. The timber of this very elegant tree is extremely hard, red, compact, ponderous, and capable of being polished; and is used for cogs in the sugar mills and other works where considerable friction is required. Browne says it is common in Antigua and Jamaica as well as Barbadoes, and grows generally to a considerable size; that it fills the woods with the flagrant smell of its leaves, which on account of their agreeable astringency are used for sauce with food, and nearly resemble those of cinnamon. The bark however has no warmth of that sort, though the berries resemble cloves very much, both in form and flavour. It is commonly called Wild Cinnamon, or Wild Clove Tree, in Antigua and Jamaica. See the twenty-ninth species.

33. Myrtus Coriacea; *Sumach-leaved Myrtle.* Peduncles trichotomous, terminating; leaves roundish-elliptic, convex, coriaceous, veinless, doted, shining on both sides. The whole of this plant is smooth; flowers pedicelled; fruit globular.—Native of the West Indies.

34. Myrtus Fragrans; *Fragrant Myrtle.* Peduncles axillary, trichotomous, and simple; leaves ovate, slightly convex, somewhat coriaceous, dotted, smooth. Stem arboreous; branches subdichotomous, smooth, purplish at the end.—Native of Jamaica and Guiana.

35. Myrtus Chinensis; *Chinese Myrtle.* Peduncles many-flowered; leaves ovate-lanceolate, serrate, hairy. This is an upright shrub, a foot and half high, with few ascending branches.—Native of China near Canton.

36. Myrtus Pimenta; *Pimento, Jamaica Pepper,* or *All-spice.* Flowers trichotomous-panicled; leaves oblong, lanceolate. This tree attains to more than thirty feet high, with a straight trunk covered with a smooth brown bark, dividing upwards into many branches, which come out opposite, garnished with oblong leaves, resembling those of the Bay Tree in form, colour, and texture, but longer, and placed by pairs: when these are bruised or broken, they have a very fine aromatic odour, like that of the fruit. The branches grow very regular, so that the trees make a very fine appearance, and, as they retain their leaves through the year, are worth propagation for ornament and shade. This tree begins to bear fruit in three years after it is planted, but does not arrive at maturity under seven; but then abundantly repays the patience of the planter, yielding one thousand pounds' weight of fruit from an acre. They are generally gathered in July in their green state, by twisting off the twigs with the hand or a pole cleft at one end, and are laid on cloths, spread over the barbacues or terraced floors raised a little above the ground, inclosed with an upright ledge of eight or ten inches in height, and divided by transverse partitions into four or more square compartments, that each may contain a day's picking. During the first and second day they are turned often, that the whole may be more exposed to the sun; but when they begin to dry, they are frequently winnowed, and laid in cloths to preserve them better from rain and dews, still exposing them to the sun every day, and removing them under cover every evening, till they have sufficiently dried; which usually is in ten or twelve days and is known by the darkness of their complexion and the rattling of the seeds; they appear at this time wrinkled, and changed to a very dark brown. In this state being ready for the market, they are stowed in bags or casks. Some planters kiln-dry them with great success.—Such of the

berries as come to full maturity, like many other seeds, lose that aromatic warmth for which they are esteemed, and acquire a taste perfectly like that of Juniper berries, which renders them a very agreeable food for birds, who are the most industrious planters of these trees. The berries have an agreeable, aromatic, subastringent taste, which recommends them both in the kitchen and the druggist's shop. A delicate aromatic oil is distilled from them, which answers all the purposes for which the oils of Cinnamon and Cloves have been generally used, and it is thought by some to be better than either, as it joins an astringency with its warmth. All parts of the tree are more or less aromatic, and subastringent, but the leaves seem to abound most in volatile warm particles. All-spice, which was at first brought over for dietetic purposes, has been long employed in the shops as a succedaneum to the more costly Oriental aromatics. It is moderately warm, of an agreeable flavour, somewhat resembling that of a mixture of Cloves, Cinnamon, and Nutmeg. Distilled with water, it yields an elegant essential oil, so ponderous as to sink in the water, in taste moderately pungent, in smell and flavour approaching to oil of Cloves, or rather a mixture of Cloves and Nutmegs. To rectified spirits, it imparts by maceration or digestion the whole of its virtue: in distillation, it gives over very little to this menstruum, nearly all its active power remaining concentrated in the inspissated extract. Pimento can scarcely be considered as a medicine: being however an agreeable aromatic, it is not unfrequently employed with different drugs requiring such a grateful adjunct.—This useful and most beautiful tree is propagated by seeds, which in the natural places of its growth are sown by birds, who eat the berries, and convey them to a great distance; nor is it at all improbable that the seeds passing through them are rendered fitter for vegetation than those which are immediately gathered from the tree. The plants cannot be preserved in England unless they are placed in a stove during the winter, but they will thrive in a moderate degree of warmth, and should be planted in a light soft soil, and have but little water in winter. In summer they require a large share of air; and in July, if the season proves warm, they may be placed in the open air, in a warm sheltered situation; but upon the approach of cold nights they must be removed into the stove again. The exposing of these plants to the open air for one month only, will be of great service to clean their leaves from insects or filth, which they are subject to contract, by remaining long in the stove; but if the season should prove very wet or cold, it will not be safe to trust these plants long abroad, therefore their leaves should be now and then washed with a sponge to clean them, which will not only render them more sightly, but also promote their growth. This tree is rather difficult to propagate in England, where the seeds do not ripen: the only method by which this has been done, is by laying down the young branches, slitting them at a joint in the same manner as is practised in making layers of Carnations. If this is carefully performed, and the layers are regularly but gently watered, they will put out roots in one year: then they may be carefully separated from the old plants, and each planted in a small pot filled with light earth, and plunged into the tan-bed, either in the stove or under a frame, being careful to shade them until they have taken new root, after which they may be treated as the older plants. This plant being an evergreen, makes a fine appearance in the stove at all seasons of the year; and the leaves having such an agreeable fragrancy when rubbed, renders them as worthy of a place in the stove as any other tender exotic plant which is preserved for ornament. It succeeds well in our stoves, if allowed a strong heat, and flowers copiously in May and June. As these plants do not rise so readily from seeds in England, the best way to obtain them is to get some person of skill in America, to take up a number of young plants, and place them close in boxes of earth, setting them in the shade till they have taken new root; then remove them into an open situation, where they may have time to establish their roots before they are shipped for England; and in their passage they should be completely guarded from the sprey of the sea and salt water, and but sparingly watered; by this means the plants may be brought in good health to England, provided they come over any time in the summer, and have time to strike root before the cold weather sets in.

NAJ NAM

NAJAS; a genus of the class Monœcia, order Monandria.—Generic Character. *Male. Calix:* perianth one-leafed, truncate at the base, cylindric, attenuated above; at the mouth with two opposite reflex segments. *Corolla:* one-petalled, equal; tube the length of the calix; border five-parted, with oblong revolute segments. *Stamina:* filamenta none; anthera oblong, erect. *Female. Calix* and *Corolla:* none. *Pistil:* germen ovate, ending in an attenuated style; stigmas simple, permanent. *Pericarp:* capsule ovate, one-celled. *Seeds:* ovate-oblong. Essential Character. *Male: Calix:* cylindric, bifid. *Corolla:* four-cleft; filamentum none. *Female. Calix* and *Corolla:* none. *Stigma:* two or three, undivided. *Capsule:* ovate, one-celled.—The species are,

1. Najas Marina. Stem wide, having triangular spines scattered over it; leaves firm, narrow, with very similar toothed spines on each side; flowers solitary, from the axils of the leaves, male and female near each other; the males drooping, on a short petiole, the females sessile, erect. The whole plant floats under water, having the slender branched stem, and narrow pellucid leaves of a Potamogeton.—Native of the sea-coast of Europe; in the canal between Pisa and Leghorn; and in the Rhine near Basle.

2. Najas Canadensis; *Canadian Najas.* Plant filiform, smooth, with linear leaves like threads.—Found by Michaux in the lakes of Canada.

Naked Ladies. See *Colchicum Autumnale.*

Nama; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth one-leaved, five-parted, permanent; segments lanceolate, acute, straight, somewhat spreading. *Corolla:* one-petalled, wheel-salver-shaped; tube short; border five-parted; segments ovate, obtuse, the length of the calix. *Stamina:* filamenta five, filiform, ovate at the base, inserted into the middle of the tube of the corolla, alternate with, and shorter than the segments; antheræ oblong, bifid at the base, revolute, incumbent. *Pistil:* germen ovate, superior; styles two, capillary, erect, the length of the stamina; stigmas capitate. *Pericarp:*

capsule ovate-oblong, blunt, compressed, grooved on each side, one-celled, two-valved, shorter than the calix. *Seeds:* numerous, very small, fastened to a flat receptacle in the middle of the partition. ESSENTIAL CHARACTER. *Calix:* five-leaved. *Corolla:* five-parted. *Capsule:* one-celled, two-valved.——The only known species is,

1. Nama Jamaicensis. Root simple, thready; stem herbaceous, from two inches to half a foot in length, subdivided, procumbent, pubescent, tender, three-winged, from the decurrent petioles; branchlets from the axils of the leaves, procumbent. Browne says, that this little plant spreads about the root, and seldom grows above five or six inches in length; that the whole of it is somewhat hairy, with the stalks and branches margined.—It is an annual, and native of Jamaica, on cultivated grounds, and on rocks.

Nandina; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth many-leaved, imbricate in six rows; scales about six in each row, ovate-acute, smooth, caducous. *Corolla:* petals six, oblong, concave, acute, longer than the calix, caducous. *Stamina:* filamenta six, very short; antheræ oblong, erect, the length of the corolla. *Pistil:* germen ovate, smooth, superior; style three-cornered, very short; stigma three-cornered. *Pericarp:* berry juiceless, globular, smooth. *Seeds:* two, hemispherical, smooth. ESSENTIAL CHARACTER. *Calix:* many-leaved, imbricate. *Corolla:* six-petalled.——The only known species is,

1. Nandina Domestica. Root perennial; stems several, shrubby, upright, loose, branched at top, a fathom in height, the thickness of a finger or thumb.—Native of Japan, where it is generally cultivated in their gardens, flowering in May or June.

Napæa; a genus of the class Diœcia, order Monadelphia, or of the class Monadelphia, order Polyandria.—GENERIC CHARACTER. *Male.* *Calix:* perianth bell-shaped, five-cleft, round, permanent. *Corolla:* petals five, oblong, concave, patulous, convex, with oblong claws. *Stamina:* filamenta very many, capillary, of a middling length, connected in a column; antheræ roundish, compressed. *Pistil:* germen conical, minute; style cylindric, ten-cleft, capillary; stigma none. *Pericarp:* abortient. *Female:* on a distinct individual. *Calix* and *Corolla:* as in the male. *Stamina:* filamenta as in the male, but shorter; antheræ small, effete. *Pistil:* germen conical; style as in the male, longer than the stamina; stigmas blunt. *Pericarp:* capsules ten, converging into an ovate form, sharpish, awnless. *Seeds:* solitary, kidney-form. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Petals:* five. *Male.* *Stamina:* monadelphous, very many, fertile. *Styles:* several, barren. *Female.* *Stamina:* monadelphous, very many, barren. *Styles:* several, longer than the stamina. *Capsule:* orbicular, depressed, ten-celled. *Seeds:* solitary.—The plants of this genus are easily propagated by seeds sown in a bed of common earth in the spring. Keep them clear from weeds till autumn, and then transplant them where they are to remain. They delight in a rich moist soil, in which they will grow very luxuriantly, and must be allowed room.——The species are,

1. Napæa Lævis; *Smooth Napæa.* Peduncles naked, smooth and even; leaves alternate, serrated, lobed, smooth. Root perennial, frequently creeping; stems smooth, about four feet high.—This, as well as the next species, grows naturally in Virginia and other parts of North America. They flower from July to September, the seeds ripen in autumn, and then the stalks decay. From their bark a sort of hemp might be produced, of the same kind as that afforded by many of the malvaceous tribe.

2. Napæa Scabra; *Rough Napæa.* Peduncles involucred, angular; leaves palmate, rugged. Root perennial, composed of many thick fleshy fibres, striking deep into the ground, and connected at the top into a large head, from which come out many rough hairy leaves.—See the first species.

Narcissus: a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* spathe oblong, obtuse, compressed, opening on the flat side, shrivelling. *Corolla:* petals six, ovate, acuminate, flat, equal, inserted into the tube of the nectary, externally above the base; nectary one-leafed, cylindric, funnel-form, coloured on the border. *Stamina:* filamenta six, awl-shaped, fixed to the tube of the nectary, shorter than the nectary; antheræ oblongish. *Pistil:* germen roundish, obtusely three-sided, inferior; style filiform, longer than the stamina; stigma bifid, concave, obtuse. *Pericarp:* capsule roundish, obtusely three-cornered, three-celled, three-valved. *Seeds:* many, globular, appendicled. ESSENTIAL CHARACTER. *Petals:* six, equal. *Nectary:* funnel-form, one-leafed. *Stamina:* within the nectary.——The species are,

1. Narcissus Poeticus; *Poetic* or *White Narcissus.* Spathe one-flowered; nectary wheel-shaped, very short, scariose, crenulate. This has a smaller and rounder bulb than the common Daffodil. The stalk or scape does not rise higher than the leaves, which are of a gray colour. At the top of the stalk comes out one flower from the spathe, nodding on one side; corolla snow white, spreading open, flat, the petals rounded at the points. The nectary or cup in the centre is very short, and fringed on the border with a bright purple circle. The flowers have an agreeable odour, appear in May, and seldom produce seeds. The Double White Narcissus is a variety of this.—It is a native of Italy, the south of France, Switzerland, and Carniola; said also to be found wild in England on sandy heaths, as at Shorne, between Gravesend and Rochester; and at Wood Bastwick, and other places in Norfolk. From the descriptions of Theophrastus, Dioscorides, and Pliny, there is little doubt of this species being the Narcissus of those authors and of the ancient poets. The next species, if it be really distinct, was probably not considered as a separate species by the ancients, since Ovid describes his Narcissus to have a yellow cup; whereas Dioscorides makes it purple, and Pliny sometimes one and sometimes the other.—This, and the nine following species, and all the hardy sorts of Daffodil and Narcissus, may be planted in large borders of the flower-garden, where, being intermixed with other bulbs, they create an agreeable variety. They will thrive in almost any soil or situation, and even under the shade of trees, where they will produce annually in the spring great quantities of flowers for several years together without transplanting, and make a good appearance before the trees come out in leaf. They increase abundantly by offsets. The double sorts should be taken up yearly, to prevent their becoming single.

2. Narcissus Biflorus; *Two-flowered Narcissus,* or *Pale Daffodil.* Spathe two-flowered; nectary wheel-shaped, very short, scariose, crenulate; leaves acute on the keel, the edges turned inwards. This is called the Primrose Peerless by our old authors. It often produces only one flower, and may then be mistaken for one of the varieties of the preceding species. It has however usually two flowers, and sometimes, though very rarely, even three. It may be distinguished from the first species by the following differences: the petals are of a yellowish hue, or rather a pale cream colour; the nectary is wholly yellow, not having the orange or crimson rim; and it flowers at least three weeks earlier. The top of the flowering-stem, very soon after it emerges from the ground,

bends down and becomes elbowed, whereas in the first species it continues upright till within a short time of the flowers expanding.—Native of several parts of Europe. Gerarde says that it grows wild in fields, and by the sides of woods in the west of England: Ray also observed it wild, but suspected that it might have originally come out of gardens. It has been found near Hornsey Church; in several places near Harefield; near Halifax; and near Whitechurch in Cheshire. It flowers towards the end of April.

3. Narcissus Pseudo-Narcissus; *Common Daffodil.* Spathe one-flowered; nectary bell-shaped, erect, curled, equalling the ovate petals; root large, bulbous, from which come out five or six flat leaves, about a foot long, and an inch broad, of a grayish colour, and a little hollow in the middle, like the keel of a boat. The stalk rises a foot and half high, having two sharp longitudinal angles; at the top comes out one nodding flower, inclosed in a thin spathe; the corolla is of one petal, being connected at the base, but cut almost to the bottom into six spreading parts; in the middle is a bell-shaped nectary, called by gardeners the cup, which is equal in length to the petal, and stands erect. The petal is of a pale brimstone or straw colour, and the nectary is of a full yellow; seeds roundish, black. The principal varieties: 1. With white petals, and a pale yellow cup. 2. With yellow petals, and a golden cup. 3. With a double flower. 4. With three or four cups within each other. 5. Tradescant's Daffodil.—Native of many parts of Europe; Spain, Italy, Germany, Switzerland, France, and England, where it flowers in March, being of rapid growth, and short duration, and is found in pastures, woods, and hedges. It has been observed near Charlton, Woolwich, and Erith, in Kent; in Norfolk; Whitwell, near Coton, and Whittlesford, in Cambridgeshire; Nokewoods, in Oxfordshire; in abundance near Halifax; at Hanley Castle, in Worcester; Madeley, in Shropshire; in Lancashire; and beyond Erdington on the road from Birmingham to Sutton it covers almost a whole field.

4. Narcissus Bicolor; *White and Yellow Daffodil.* Spathe one-flowered; nectary bell-shaped, with the margin spreading, curled, equalling the petals. This resembles the common Daffodil; but the petals are white, the nectary is dark yellow and larger, with a spreading, waved, notched border. Gouan says it is easily distinguished by its leaves, scarcely a palm in length, and half an inch in breadth; by its large flower, with cordate-ovate petals, imbricate at the base, and sulphur-coloured; and by the nectary having a reflex mouth, twelve-cleft or thereabouts, the lobes also being toothed and curled; the scape is the length of the leaves, or a little shorter and thicker. There is a variety of this species, called the *Great Daffodil*, which is the largest of the genus, and bears the most magnificent flowers; and though it has been long known in this country, is still confined to the gardens of the curious: it is taller than the common Daffodil, which it resembles in general appearance, but its leaves are more twisted, as well as more glaucous; the flower, but especially the nectary, is much larger, and the petals, which are always of a bright yellow, more spreading. Native of Spain, and varies with double flowers.—It flowers in April and May, and is a native of the South of Europe.

5. Narcissus Minor; *Least Daffodil.* Spathe one-flowered; nectary obconical, erect, curled, six-cleft, equalling the lanceolate petals. This is very nearly related to the common sort, and is three times less in all its parts; but notwithstanding this, when the roots are planted in a cluster, the flowers make a very pretty show, and have the advantage of appearing rather earlier than any of the others.—The petals are pale yellow, the cup darker.—Native of Spain.

6. Narcissus Moschatus; *Musk Narcissus.* Spathe one-flowered; nectary cylindric, truncate, subrepand, equalling the oblong petals.—Native of Spain.

7. Narcissus Triandrus; *Rush-leaved Narcissus*, or *Reflexed Daffodil.* Spathe one or two flowered; flowers drooping; petals reflexed, three of the stamina longer. This is the same size as the first species; which see. The whole of the corolla is snow white.—Native of the Pyrenees.

8. Narcissus Orientalis; *Oriental Narcissus.* Spathe one or two flowered; nectary bell-shaped, trifid, emarginate, three times shorter than the petals; corolla white. It flowers in May.—Native of the Levant.

9. Narcissus Trilobus. Spath submultiflorous; nectary bell-shaped, subtrified, quite entire, shorter by half than the petals.—Native of the South of Europe.

10. Narcissus Odorus; *Sweet-scented Narcissus*, or *Great Jonquil.* Spathe one or two-flowered; nectary bell-shaped, six-cleft, even, shorter by half than the petals; leaves semi-cylindric; flowers deep yellow colour.—This species, which, as its name implies, possesses more fragrance than many of the others, is a native of the South of Europe, flowers in April, and varies with double flowers. See the fifteenth species.

11. Narcissus Calathinus. Spathe many-flowered; nectary bell-shaped, almost equalling the petals; leaves flat. This very much resembles the next species, but the petals are a little larger and sharper, and the nectary is the same length as the petals. It has the odour of the Jonquil.—Native of the south of Europe, and the Levant. See the fifteenth species.

12. Narcissus Tazzetta; *Polyanthus Narcissus.* Spathe many-flowered; nectary bell-shaped, plaited, truncate, three times shorter than the petals; leaves flat. Bulb large, roundish; scape or flower-stalk broadish, upright, angular, concave, from ten or twelve to eighteen inches in height; flowers six or seven to ten from one spathe, very fragrant, clustered, white, or yellow. There is a greater variety of the Polyanthus Narcissus than of all the other species; for the flowers being very ornamental, and coming early in the spring, the florists in Holland, Flanders, and France, have taken great pains in cultivating and improving them. The principal varieties are, 1. Petals yellow, with orange, yellow, or sulphur-coloured cups or nectaries. 2. Petals white, with orange, yellow, or sulphur-coloured cups or nectaries. 3. Petals white, with white cups or nectaries. 4. Double flowers of the different varieties.—The varieties with white petals and white cups, are not so much esteemed as the others; there are, however, two or three with large bunches of small white flowers, which are valuable for their agreeable odour, and for flowering later than most of the others. There is also one with very double flowers, the outer petals white, those in the middle some white, others orange coloured. This has a very agreeable scent, flowers early, and is generally called the Cyprus Narcissus; it is the most beautiful of all the varieties when blown in glasses in a room. The Dutch and London catalogues contain about an hundred sub-varieties under these heads, with pompous names, which are too subject to the light breath of fashion and caprice to be enumerated here.—We shall now treat at length of the method of raising the fine sorts of Polyanthus Narcissus from seeds, in order to obtain new varieties. It has been customary to send abroad annually for large quantities of the flower roots, for which a great price has been paid, while we might as well have propagated them from seeds at home. In saving the seeds, none should be gathered but from such flowers as have good properties, and particularly from such only as

have many flowers upon a stalk, that flower tall, and have beautiful cups to their flowers, from such you may expect to raise good flowers; but if ordinary seed be sown, there can be no hope of procuring any valuable flowers. Having provided good seed, either procure some shallow cases, or flat pans, made on purpose for the raising of seedlings, which should have holes in their bottoms, to let the moisture pass off; these must be filled with fresh, light, sandy earth, about the beginning of August, that being the season for sowing the seeds of most bulbous-rooted flowers: the earth in these pans must be levelled very even; then sow the seeds thereon pretty thick, covering them over with the fine sifted light earth about half an inch thick, and place the cases or pans in a situation where they may have only the morning sun till about ten o'clock, where they should remain till about the beginning of October, when they must be removed into a warmer situation, placing them upon bricks, that the air may freely pass under the cases, which will preserve them from being too moist. They also should be exposed to the full sun, but screened from the north and east winds; and if the frosts should be severe they must be covered, or they will be indanger of being destroyed; in this situation they may remain until the beginning of April, by which time the plants will be up, and must be carefully weeded, and frequently watered in dry seasons. The cases should also now be removed into their former shady position, or shaded in the middle of the day, for the heat of the noon-day sun will be too great for the young plants. At the latter end of June when the leaves of the plants are decayed, take off the upper surface of the earth in the cases, as by that time it will have contracted a mossiness, which, if suffered to remain, will greatly injure the young roots. In doing this, observe not to take it so deep as to touch the roots; and afterwards sift some fresh light earth over the surface, about half an inch thick, which will greatly strengthen the roots; the same should also be repeated in October, when the cases are moved again into the sun. During the summer season, if the weather should be very wet, and the earth in the cases appear very moist, they must be removed into the sun until the earth be dry again; for if the roots imbibe much wet during the time they are inactive, it very often rots them; therefore they must not be watered after their leaves are decayed, but should be placed in the shade, as before directed. This management will be proper during the two first seasons, until their leaves are decayed; but the second summer after sowing, the roots should be carefully taken up, by sifting the earth through a sieve, by fine which the roots will be easily separated from the earth: then having prepared a bed or two of good, fresh, light earth, in proportion to the quantity of roots, plant them therein, about three inches deep, and three inches apart every way. These beds should be raised above the level of the ground, in proportion to the moisture of the soil, which, if dry, three inches will be enough; but if it be wet, they must be raised six or eight inches high, and laid a little rounding, to shoot off the wet. If these beds are made in July, which is the best time to transplant the roots, the weeds will soon appear very thick, and the surface of the ground must on that account be gently hoed to destroy them, taking care not to cut so deep as to touch any of the roots. This hoeing should be repeated as often as the growing of the weeds renders it necessary, observing always to perform it in dry weather, that they may be effectually destroyed; and towards the latter end of October, after having entirely cleared the beds from weeds, sift a little light earth about an inch thick over them; this being washed down to the roots by the winter's rain, will greatly promote their shooting in the spring. If the cold should be very severe in winter, cover the beds either with old tan or sea-coal ashes, or with pease haulm, or some such light covering, to prevent the frost from penetrating the ground to the roots, which might greatly injure them while they are so young. In the spring, when the plants begin to appear above ground, gently stir the surface of the ground, clearing it from weeds, but be very careful not to injure the plants, and in dry seasons refresh them with water. When their leaves are decayed, clear the beds from weeds, and sift a little earth over them as was before directed, which must also be repeated in October in like manner; but the roots should not remain more than two years in these beds, by which time they will be grown so large as to require more room; they should therefore be taken up as soon as their leaves are decayed, and planted into fresh beds, dug deep, with a little very rotten dung buried in the bottom, for the fibres of the roots to strike into. Then the roots should be planted at six inches' distance, and the same depth in the ground. In the autumn, before the frost comes on, if some rotten tan be laid over the beds, it will keep out the frost, and greatly encourage the roots; and if the winter should prove severe, it will be proper to lay a greater thickness of tan over the beds, and also in the alleys, to keep off frost, or to cover them over with straw or pease haulm, or otherwise they may all be destroyed by the cold. In the spring, these coverings should be removed as soon as the danger from hard frost is over, and the beds must be kept free from weeds during the summer. At Michaelmas they should have some fresh earth laid over them, and covered again with tan, and so every year till they flower, which is generally in five years from the seed, when you should mark all such as promise well, which should be taken up as soon as the leaves decay, and planted at a great distance in prepared beds; but those which do not flower, or are unpromising, should be permitted to remain in the same bed; therefore in taking up the best roots, care must be taken not to disturb those that remain: the earth should be again levelled, and some fresh earth sifted over the beds as before; this will cherish the roots, for it often happens in the seedlings of these flowers, that at their first time of blowing they seldom appear half so beautiful as as they do in the second year; on this account none of them should be rejected until they have flowered two or three times, and a fair judgment can be formed.—Having laid down directions for sowing and managing these roots until they are strong enough to flower, we shall proceed to give particular instructions for managing the roots afterwards, so as to cause them to produce large fair flowers. All the sorts of Narcissus which produce many flowers upon a stalk, should have a situation defended from cold and strong winds, otherwise they will be subject to be injured by the cold in winter, and their stems will break down while in flower; for though their stalks are generally rather strong, yet the number of flowers upon each renders their heads weighty, especially after rain, which lodges in the flowers, and if succeeded by stormy winds, frequently destroys their beauty when they are exposed; so that a border under a hedge which is open to the south-east, is preferable to any other position for these flowers. The morning sun rising upon them will dry off the moisture, which had lodged upon them the preceding night, and cause them to expand fairer than when they are planted in a shady situation; and if they are too much exposed to the afternoon sun, they will be hurried out of their beauty very soon; and the strong west and south-west winds will greatly injure them, if they be exposed to their fury. When a proper situation has been selected, pro-

ceed to prepare the earth necessary to plant them in; for if the natural soil of the spot be very strong or poor, it will be proper to make the border of new earth, removing the original earth to the depth of three feet. The best earth for these flowers is a fresh light hazel loam, mixed with a little very rotten cow's dung: this should be well mixed together, and often turned over, in order to sweeten it; then having removed away the old earth to the forementioned depth, put a layer of rotten dung or tan in the bottom about four or five inches thick, upon which you must lay some of the prepared earth about eighteen or twenty inches thick, making it exactly level; then having marked out by line the exact distances at which the roots are to be planted, which should not be less than six or eight inches square, place the roots accordingly, observing to set them upright; then cover them over with the before-mentioned earth about eight inches deep, being very careful in doing it not to displace the roots; when this is done, you must make the surface of the border even, and make up the side straight, which will appear handsome. The best time for planting these roots is in the end of August or beginning of September; for if they be kept too long out of the ground, it will cause their flowers to be weak. You should also observe the nature of the soil where they are planted, and whether it be wet or dry, according to which the fresh earth must be adapted and the beds disposed; for if the soil be very strong, and the situation moist, a light earth should be chosen, and the beds must be raised six or eight inches, or a foot, above the level of the ground, or the roots will be in danger of being destroyed by too much wet: but if the situation be dry, and the soil naturally light, you should then allow the earth to be a little stronger, and the beds need not be raised above three or four inches high; for if they be made too high, the roots will suffer very much in dry springs; and in very severe winters those beds which are raised much above the level of the ground, will be more exposed to the cold than those which are lower, unless the alleys are filled up with rotten tan or litter. During the summer, the only culture which these flowers require, is weeding, and when their leaves are entirely decayed, they should be raked off, and the beds made clean: but on no account ought their leaves to be cut off till they are quite decayed, for that greatly weakens the roots. Towards the middle of October, if the weeds have grown upon the beds, in a dry day gently hoe the surface of the beds to destroy them, observing to rake the earth over, and smooth it again. Before the frosts come on, the beds should be covered over two inches thick with rotten tan, to keep out the frost; after which they will require no further care till the spring, when their leaves will appear above ground, at which time the surface of the earth ought to be gently stirred with a small trowel, being very careful not to injure the leaves of the plants, and rake it smooth with your hands, clearing off all weeds, &c. which, if suffered to remain at that season, would soon grow so fast as to appear unsightly, and will exhaust the nourishment from the earth. With this management these roots will flower very strong, some of which will appear in March and others in April; which, if suffered to remain, will continue in beauty a full month, and are at that season very great ornaments to a flower-garden. After the flowers are past and the leaves decayed, stir the surface of the ground to prevent the leaves from growing; and if at the same time you lay a little very rotten dung over the surface of the beds, the rain will wash down the salts thereof, which will strengthen the roots in the succeeding year. During the summer they will require no further care but to keep them clear from weeds till October, when the surface of the beds should be again stirred, raking off all weeds, &c. and laying some good fresh earth over the beds about an inch deep, which will make good the loss sustained by weeding, &c. and in the spring, manage as was directed for the preceding year. These roots should not be transplanted oftener than every third year, if they be expected to flower strong and make a great increase; because the first year after removing, they never flower so strong as they do in the second and third; nor will the roots increase so fast when they are often transplanted; but if you let them remain longer than three years unremoved, the number of offsets which will by that time be produced, will exhaust the large bulbs, and cause them to produce very weak flowers; therefore at that time of transplanting them, all the small offsets should be taken off, and planted in a nursery bed by themselves, but the large bulbs may be replanted for flowering. If you plant them in the same bed where they grew before, you must take out all the earth two feet deep, and fill it up again with fresh, in the way already described, which will be equal to removing them into another place: this is the constant practice of the gardeners in Holland, who have but little room to change their roots; therefore they every year remove the earth of their beds, and put in fresh, so that the same place is constantly occupied by the same flowers. But those persons take up their roots every year, for as they cultivate them for sale, the rounder their roots are, the more valuable they will be: the way to have them so, is to take their offsets from them annually; for when their roots are left two or three years unremoved, the offsets will have grown large, and these pressing against each other, will cause their sides to be flatted; so that where the roots are propagated for sale, they should be annually taken up as soon as their leaves decay; and the large bulbs may be kept out of the ground till the middle or end of October, but the offsets should be planted the beginning of September or sooner, that they may get strength, so as to become blowing roots the following year: but where they are designed for ornament, they should not be removed oftener than every third year, for then the roots will be in large bunches, and a number of stalks with flowers coming from each bunch, they will make a much better appearance than where a single stalk rises from each root, which will be the case where the roots are annually removed.

13. Narcissus Bulbocodium; *Hoop Petticoat Narcissus.* Spathe one-flowered; nectary turbinate, larger than the petals; stamina and style declining; bulbs small; flower-stalk slender, taper, about six inches long; petals scarce half an inch long, cut into six acute segments; the nectary or cup is more than two inches long, very broad at the brim, lessening gradually to the base, formed somewhat like the old farthingale or bell-hoop petticoat worn by the ladies; flower inodorous, of a golden yellow.—Native of Portugal.

14. Narcissus Serotinus; *Late-flowering Narcissus.* Spathe one-flowered; nectary six-parted, very short; leaves awl-shaped; bulb-small; stalk jointed, nine inches high; corolla white cut into six narrow segments; cup yellow. It flowers late in the autumn.—Native of Spain, Italy, and Barbary.

15. Narcissus Jonquilla; *Common Jonquil.* Spathe many-flowered: nectary bell-shaped, short; leaves awl-shaped. Scape round, hollow, producing at top from three to five flowers from a spathe, sometimes no more than two; petals very fragrant, orbiculate, of a golden yellow, like the cup; bulb small, white, covered with dark membranes. It flowers in April and May, and varies with double flowers.—Native of Spain. This, and the tenth and eleventh species, should be planted in beds or borders separate from other roots, because they require to be transplanted at least every year,

otherwise their roots are apt to grow long and slender, and seldom flower well after; which is also the case if they are continued many years in the same soil: wherefore the root should be often removed from one part of the garden to another, or at least the earth should be often renewed, which is the most probable means of preserving their flowers in perfection. The soil in which these flowers succeed best, is an hazel loam, neither too light nor over stiff; it must be fresh, and free from roots of trees or noxious weeds, but should not be dunged, for it is very remarkable, that where the ground is made rich, they seldom continue very good long, but are subject to shoot downwards, and form long slender roots. These flowers are greatly esteemed by many persons for their strong sweet scent, though few females can bear them, especially if confined in a room. Where they can be endured, they may be successfully blown in glasses, as well as the Polyanthus Narcissus. The glasses should be filled up to the bottom of the bulb with fresh soft water, and placed in a light warm room, near windows which have the benefit of the sun, keeping the water up to the same height, by putting in a fresh supply every fortnight or three weeks. These and other flowers may also be brought forward in a warm room in pots set in pans of water; or still more effectually in stoves or hot-beds, by which means a succession of these flowers may be obtained during the winter and spring, till they appear in the natural ground.

Nard. See *Andropogon Nardus.*

Nardus; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* two-valved; outer valve lanceolate-linear, long, pointed, embracing the smaller with its belly; inner smaller, linear, pointed; nectary none. *Stamina:* filamenta three, capillary, shorter than the corolla; antheræ oblong. *Pistil:* germen oblong; style one, filiform, long, pubescent; stigma simple. *Pericarp:* none: the corolla grows to the seed, and does not open. *Seed:* one, straight, linear-oblong, acuminate at both ends, narrow at top. Essential Character. *Calix:* none. *Corolla:* two-valved.——The species are,

1. Nardus Stricta; *Common Mat Grass.* Spike bristle-shaped, straight, pointing one way. Root perennial; culms from a span to a foot in height, slender, stiff, roughish, having one, two, or three joints near the base, with a short leaf to each, and thence naked to the spike; florets yellowish-white or purple, pubescent, alternate, sessile. This grass is easily distinguished by the slenderness and rushy stiffness of the stalks and leaves, and by the florets being thinly dispersed along the spike, mostly in pairs pointing all the same way, and having each only one style. Linneus observes, that being hard, stiff, and short, it eludes the stroke of the scythe, or takes off its edge, and is therefore disliked by the mowers. He also says, that the crows frequently stock it up for the sake of the larva of some *tipula,* which they find at the root; and that horses and goats eat it, but that cows and sheep refuse it. In England it seldom encounters the mower's scythe, being generally found on bogs or heaths. It flowers from May or June till August.—Native of most parts of Europe, in woody, moist, and barren meadows.

2. Nardus Aristata; *Awned Mat Grass.* Calices awned; root biennial. The leaves curve back and roll up like hair, dry away, and then disappear in part. It is very small. Native of sandy soils in the south of Europe.

3. Nardus Indica; *Indian Mat Grass.* Spike bristle-shaped, pointing one way, a little curved inwards. It is a finger's length high.—Native of Tranquebar.

4. Nardus Ciliaris; *Ciliated Mat Grass.* Spike curved in, ciliate; leaves flat; culm a span high.—Native of the East Indies.

Nasturtium. See *Sysymbrium Nasturtium.*

Nauclea; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* common, none; receptacle common, globular, subvillose, covered all over with florets; perianth proper, one-leafed, oblong, incrusting the germen; mouth contracted, entire. *Corolla:* proper one-petalled, funnel-form, placed on the mouth of the perianth; tube filiform, longer; border short, five-parted; segments ovate, blunt, recurved. *Stamina:* filamenta five, very short, in the throat of the corolla; antheræ ovate, the length of the tube. *Pistil:* germen inferior, oblong; style capillary, erect, longer than the corolla; stigma obovate. *Pericarp:* capsule incrusted with the calix, turbinate, attenuated below, blunt at the top, two-grained, two-celled; grains fastened by a thread at top. *Seeds:* according to Gærtner, several, small, ovate, compressed a little, membranaceous, margined, attenuated into a bristle-shaped tail, fastened to the suture. Essential Character. *Corolla:* funnel-form. *Capsule:* inferior of two disjointed cells, with many seeds. *Receptacle:* common, globular.——The species are.

1. Nauclea Orientalis. Leaves ovate, obtuse; peduncles terminating, solitary. This is a large tree, with a straight trunk and spreading branches; flowers on a long peduncle, composed of very many yellow florets gathered into a ball two inches in diameter. The wood is yellow, solid, and beautiful, and fit for all kinds of in-door work, but rots quickly when exposed to air and wet.—Native of the East Indies, Cochin-china, and the Society Isles.

2. Nauclea Parvifolia. Leaves oval; peduncles terminating, solitary, or in threes. Trunk straight, with a brownish-gray cracked bark; branches opposite, numerous, spreading, forming a large, oval, shady head; flowers small, light yellow. The wood is of a light chestnut colour, firm and close-grained: it is employed for various purposes where it can be kept dry, but soon rots when exposed to wet. It grows to a large tree, which is called *Bota-cadamie* by the Telingas.—It flowers during the cold season; and is a native of the coast, but principally of the mountains of Coromandel.

3. Nauclea Cordifolia. Leaves broad-cordate; peduncles axillary, one to four. Trunk erect; bark like that of the preceding; branches very numerous, horizontal, forming a very large shady head. The wood is exceedingly beautiful; its colour like that of the Box-tree, but much lighter, and at the same time very close-grained; it is to be had of a large size, from one to two feet or more in diameter; it is used for almost every purpose where it can be kept dry, and answers very well for furniture, being pretty light and durable. The Telingas call it *Daduga:* it flowers during the wet season, and the seeds are ripe about April. It grows to a large tree.—Native of the mountainous parts of the coast of Coromandel.

4. Nauclea Purpurea. Leaves oblong, pointed; peduncles terminating, solitary, or in threes. Trunk irregular, with a scabrous ash-coloured bark; branches opposite, decussated; flowers larger than any of the preceding, of a purple colour. The Telingas call it *Bagada.* It is a small tree, and flowers in April, at the beginning of the hot season.—Native of the moist valleys amongst the Circar mountains.

Navelwort. See *Cotyledon.*

Navelwort, Venus's. See *Cynoglossum Linifolium.*

Navew. See *Brassica.*

Neckera; a genus of the class Cryptogamia, order Musci.—Generic Character. *Capsule:* oblong; peristome double; outer with sixteen sharp teeth; inner with sixteen distinct cilias, alternate with teeth of the outer. *Males:* germinaceous, on distinct plants.——The species are,

1. Neckera Heteromalla, which is the Hypnum Hetero-

mallum of Gmelin, Spagnum Arboreum of Hudson, and the Fontinalis Secunda of Withering; to whose works the reader is referred for the descriptions of this and the two following species.

2. Neckera Pennata of Hedwig, is the Hypnum Pennatum of Gmelin, and the Fontinalis Pennata of Withering.

3. Neckera Pumila of Hedwig, is the Hypnum Pumilum and Dicksoni of Gmelin, and Hypnum Pennatum of Withering and Dickson.—Sixteen species are described by Hedwig, five of them British.

Nectarine. See *Amygdalus.*

Nectris; a genus of the class Hexandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, six-parted; the three outer segments ovate, acute, coloured within; the three inner alternate with these, ovate, blunt, smaller, coloured on both sides. *Corolla:* none. *Stamina:* filamenta six, capillary, inserted into the base of the calicine segments; antheræ ovate. *Pistil:* germina two, superior, oblong; styles short; stigmas blunt. *Pericarp:* capsules two, ovate, somewhat fleshy, crowned with the permanent styles, one-celled. *Seeds:* numerous, very small. Essential Character. *Calix:* one-leafed, six-parted, coloured. *Corolla:* none. *Styles:* permanent. *Capsules:* two, superior, ovate, one-celled, many-seeded.——The only species is,

1. Neotris Aquatica. This plant grows in ponds, lakes, and rivers that have not a rapid current, pushing out long, branched, knotted, fistulous stems, with a pair of leaves at each joint.—Native of Guiana and the isle of Cayenne.

Nepenthes; a genus of the class Diœcia, order Monadelphia.—Generic Character. *Male. Calix:* perianth one-leafed, coriaceous, coloured within, spreading, four-parted; segments roundish, minutely toothletted, almost equal. *Corolla:* none. *Stamina:* filamentum one, columnar, cylindric, erect, a little shorter than the calix; antheræ many, one-celled, connected into a convex peltate head, concave at the centre, round the upper part of the filamentum, three of them at the top transverse. *Female:* on a distinct plant. *Calix:* as in the male, permanent. *Corolla:* none. *Pistil:* germen ovate, four-grooved, superior, the length of the calix; style none; stigma large, peltate, four-lobed, hollowed out into four excavations, permanent. *Pericarp:* capsule oblong, columnar, truncate, crowned with the permanent stigma, quadrangular, the sides grooved, four-celled, four-valved, gaping at the angles; partitions contrary. *Seeds:* numerous, oval, inclosed in long, membranaceous, angular, arils, acuminate at both ends, fastened obliquely to the inner angle of each cell in a double row. Essential Character. *Male. Calix:* four-parted. *Corolla:* none. *Filamentum:* one, with many *antheræ,* connected into a peltate head. *Female. Calix* and *Corolla:* as in the male. *Style:* none. *Stigma:* large, peltate, four-lobed. *Capsule:* four-celled, with many arilled *Seeds.*——The only species known is,

1. Nepenthes Distillatoria. This elegant plant rises with a fungose, thick, round stalk; leaves alternate, sessile, wide, oblong, smooth, with a very strong nerve running along the middle, ending in a long tendril generally twisted, to which hangs a receptacle, or long, cylindrical, membranaceous, smooth, hollow bag, which on being pressed, yields about two ounces of a sweet, limpid, pleasant, refreshing liquor, so that six or eight of them are sufficient to slake the thirst of a man.—Native of the island of Ceylon.

Nepeta; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, cylindric; mouth five-toothed, acute, erect; upper toothlets longer, lower more spreading. *Corolla:* one-petalled, ringent; tube cylindric, curved inwards; border gaping, opening, spreading, cordate, ending in two reflex, blunt, very short segments; upper lip erect, roundish, emarginate; lower roundish, concave, larger, entire, crenulate. *Stamina:* filamenta four, awl-shaped, beneath the upper lip, approximating, two of them shorter; antheræ incumbent. *Pistil:* germen four-cleft; style filiform, length and situation of the stamina; stigma bifid, acute. *Pericarp:* none. *Calix:* straight, containing the seeds in its bosom. *Seeds:* four, subovate. *Observe.* If the segments of the throat be numbered with the lower lip, it will be three-parted. Essential Character. *Corolla:* lower lip with an intermediate segment, crenate; throat reflex at the edges. *Stamina:* approximating.—All the plants of this genus, except one or two biennials, are hardy herbaceous perennials. If the seeds be permitted to fall, the plants will rise without trouble; or being sown either in spring or autumn, will come up, and require only to be thinned where they are too close, and kept clean from weeds. Upon a poor dry soil they will not grow too rank, but continue much longer, and appear handsomer than in rich ground, where they grow too luxuriant, and have not so strong a scent.——The species are,

1. Nepeta Cataria; *Common Catmint.* Flowers in spikes; whorls subpedicelled; leaves petioled, cordate, toothserrate. Root perennial, from which arise many branching stalks two feet high; the spikes, composed of interrupted whorls, terminate the stem, and come out in branches from the axils of the leaves; corolla white, with a tinge of red, and spotted with purple. There is a variety which grows in Italy and the south of France; it is about half the size of the original, and whiter.—The whole of this plant has a strong scent between Mint and Pennyroyal. It is called Catmint, because cats are very fond of it, especially when it is withered, when they will roll themselves on it, tear it to pieces, and chew it with great pleasure. Ray observes, that plants which he transplanted from the fields into his garden were always destroyed by the cats, unless he protected them with thorns till they had taken good root and come into flower; but that they never meddled with the plants raised from seed. Hence the old saying,

> "If you set it, the cats will eat it;
> If you sow it, the cats don't know it."

Mr. Miller has confirmed this by his own experience, having frequently set a plant from another part of the garden, within two feet of others which came up from seeds; when the former was torn in pieces and destroyed by cats, whilst the latter remained unhurt. The true reason of this difference is assigned by Ray; that the cat is fond of it in a languid withering state, or when the peculiar scent of the plant is excited by being handled or bruised in gathering or transplanting.—Withering says, an infusion of the plant is an excellent medicine in suppressions of the menses, so also is the expressed juice, and may be taken to the quantity of two ounces for a dose. Hill prescribes it for nervous disorders, and the young tops, made into a conserve, as serviceable in that troublesome complaint, the nightmare. Two ounces of the expressed juice is a dose. It is a good female medicine, and may be used with advantage in hysteric and other fits. The infusion moderately promotes the menses when suppressed, and the evacuations after delivery.—This plant flowers from July to September, and is a native of most parts of Europe, being found on banks and hedges, and in calcareous soils. The Germans call it *Nepte Katzennepte,* &c.; the Dutch, *Kattekruid,* or *Nepte;* the Danes, *Katteurt,* or *Sisenbrand't;* the Swedes, *Kattmynta;* the French, *Chatairc, Cataire herbe aux Chats;* the Italians, *Gattaria;* the

Spaniards, *Gatera;* the Portuguese, *Naveda dos Gatos;* and the Russians, *Koschitza mehta.*

2. Nepeta Angustifolia; *Narrow-leaved Catmint.* Corymbs pedicelled, spiked; leaves lanceolate, wrinkled, tomentose, bluntly serrate. Stem erect, a foot high, branched: the whole plant tomentose hoary. It is by no means a variety of the preceding, nor does it change its appearance when cultivated in a garden.—Native of Arragon in Spain.

3. Nepeta Pannonica; *Hungarian Catmint.* Cymes peduncled, many-flowered; leaves lanceolate, oblong, cordate, naked; lateral lobes of the corolla reflex. Root perennial, branched, woody, the size of a quill or more, brown on the outside, knobbed at the end; stems several, from three to four feet in height, grooved, smoothish, with opposite branches forming a panicle. It flowers from August to October.—Native of Hungary.

4. Nepeta Cœrulea; *Blue-flowered Catmint.* Cymes peduncled, many-flowered, rough-haired; leaves oblong, cordate, villose, subsessile; lateral lobes of the corolla reflex. It flowers in June.—Native country unknown.

5. Nepeta Violacea; *Violet-coloured Catmint.* Cymes peduncled, many-flowered, hairy; leaves subcordate, subpetioled, almost naked; lateral lobes of the corolla spreading; stalks about two feet high, with a few slender branches coming out from the sides; flowers in roundish whorls, peduncled, blue; appearing from July to September. There is a variety with white flowers.—Native of Spain, Piedmont, Carniola, and Siberia.

6. Nepeta Ucranica. Flowers panicled; leaves lanceolate, serrate, sessile, naked.—Native of the Ukraine.

7. Nepeta Incana; *Hoary Catmint.* Panicles axillary; leaves petioled, ovate, serrate, tomentose. Stem herbaceous, roundish at bottom, decumbent, naked, bluntly four-cornered above, erect, tomentose, undivided, a span or a little more in height.—Native of Japan.

8. Nepeta Nepetella; *Small Catmint.* Cymes peduncled; leaves cordate, oblong lanceolate, deeply serrate, tomentose. This is only one-third the size of the common sort.—Native of the south of Europe.

9. Nepeta Nuda; *Naked* or *Spanish Catmint.* Racemes whorled, naked; leaves cordate, oblong, sessile, serrate. Stems two feet high, smooth, strict, four-grooved, the older ones dark purple. It flowers from June to August, has a pale blue corolla.—Native of the south of Europe.

10. Nepeta Hirsuta; *Hairy Catmint.* Flowers sessile, whorl-spiked; whorls involved in nap. Stalks about two feet high, branching from the bottom; leaves heart-shaped, obtuse, a little indented, on pretty long petioles; corolla white, appearing in July.—Native of Sicily.

11. Nepeta Italica; *Italian Catmint.* Flowers sessile, whorl-spiked; bractes lanceolate, the length of the calix; leaves petioled. Stalks seldom more than a foot high; strong-scented.—Native of Italy.

12. Nepeta Tuberosa; *Tuberous-rooted Catmint.* Spikes terminating; bractes oblong acuminate; nerve lined, coloured; leaves cordate, pubescent; lateral lobes of the corolla reflex. This has a thick knobbed root, from which come out one or two stalks that often decline to the ground; they are about two feet and a half long, and send out side-branches opposite. It flowers from June to August.—Native of Spain and Portugal.

13. Nepeta Scordotis; *Cretan Catmint.* Spikes terminating, sessile; bractes subcordate, villose; leaves cordate, blunt. Root large, from which proceed many tomentose leaves, like those of White Horehound, spreading on the ground in a circle; from the middle of these rise several stems, which are also tomentose like White Horehound, and on the top of them are white flowers in a large thick spike; seed black. The whole plant is larger and thicker than the Common Scordium, for which it is used in Crete or Candia, where it grows abundantly on rocks by way-sides and on the borders of fields.

14. Nepeta Lanata; *Woolly Catmint.* Spikes terminating; bractes ovate; nerve wrinkled, subscariose; leaves oblong cordate, villose; lateral lobes of the corolla spreading. The root consists of various fleshy, roundish, or filiform tubers; the first year forming the root-leaves, and the second many-flowering stems.—Its native place is unknown.

15. Nepeta Virginica; *American Catmint.* Heads terminating; stamina longer than the flower-leaves, lanceolate. Stems two feet high; flowers in whorls; the lower lip of the corolla is serrate, but not concave. It flowers in August.—Native of Virginia.

16. Nepeta Malabarica; *Malabar Catmint.* Spike whorled; bractes filiform; leaves lanceolate, quite entire below. Stems erect, obtuse-angled, tomentose; corolla pale violet.—Native of Malabar.

17. Nepeta Indica; *Indian Catmint.* Upper lip of the corolla quite entire, very short; flowers in whorls.

18. Nepeta Multifida. Flowers in spikes; leaves pinnatifid, quite entire. Stems erect, without branches. It flowers in June and July.—Native of Siberia.

19. Nepeta Botryoides. Flowers in spikes; lateral lobes of the corolla somewhat spreading; leaves pinnatifid; segments linear, almost equal. Stems several, erect, scarcely a foot high, decussately branched; branches opposite, erect. It flowers in June and July.—Native of Siberia.

20. Nepeta Lavandulacea. Spike compact; leaves ovate, gash-serrate, marked with lines. Stem erect, brachiate, round, purple, with white hairs; a span or a foot in height.—Native of Siberia.

Nephelium; a genus of the class Monœcia, order Pentandria.—Generic Character. *Male Flowers*, in a spiked raceme. *Calix:* perianth one-leafed, bell-shaped, five-toothed. *Corolla:* none. *Stamina:* filamenta five, awl-shaped, longer than the calix; antheræ blunt, two-parted at the base. *Female Flowers:* in the same raceme. *Calix:* perianth one-leafed, bell-shaped, four-toothed, with two opposite teeth more remote, shrivelling. *Corolla:* none. *Pistil:* germina two, superior, roundish, muricated, larger than the calix; styles two, filiform, recurved, springing up between the germina; stigmas thickish, blunt. *Pericarp:* drupe ovate, hairy, with a cartilaginous rind, and a watery pulp. (According to Gærtner, capsules two, muricated, one-celled, one-seeded.) *Seed:* nut, solitary. Essential Character. *Male. Calix:* five-toothed. *Corolla:* none. *Female. Calix:* four-cleft. *Corolla:* none. *Germina:* two, with two styles to each drupe; (or, as Gærtner says, capsules two, muricated, one-seeded.)—The only known species is,

1. Nephelium Lappaceum. Leaves alternate, pinnate, two-paired, abrupt; leaflets obovate, the outer ones larger; racemes consisting of a few spikelets, erect, shorter than the leaves. A shrub or tree.—Native of the East Indies.

Nerium: a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, acute, very small, permanent. *Corolla:* one-petalled, funnel-form; tube cylindric, shorter than the border; border very large, five-parted; segments wide, blunt, oblique; nectary a crown terminating the tube, short, lacerated into capillary segments. *Stamina:* filamenta five, awl-shaped, very short, in the tube of the corolla; antheræ sagittate, converging, terminated by a long thread. *Pistil:* germen roundish, bifid; style cylindric, the length of the tube; stigma truncate, sitting on an orblet, fastened to the antheræ, *Pericarp:* follicles

two, round, long, acuminate, erect, one-valved, opening longitudinally. *Seeds:* numerous, oblong, crowned with down placed imbricately. ESSENTIAL CHARACTER. *Corolla:* salver-shaped, contorted, with the tube terminated by a lacerated crown. *Follicles:* two, erect.—These plants are generally propagated by layers in this country, for although they will sometimes take root from cuttings, yet that being an uncertain method, the other is generally pursued; and as the plants are very apt to produce suckers or shoots from their roots, those are best adapted for laying, for the old branches will not put out roots; when these are laid down, they should be slit at a joint in the same manner as is practised in laying Carnations, which will greatly facilitate their taking root: if these branches are laid down in autumn, and are properly supplied with water, they will have taken root by that time twelvemonth, when they should be carefully raised up with a trowel; and if they have taken good root, they should be cut off from the old plant, and each planted in a separate small pot filled with soft loamy earth; those of the common sort will require no other care but to be placed in a shady situation, and gently watered as the season may require, till they have taken new root; but the two other species should be plunged into a very moderate hot-bed to forward their taking root, observing to shade them from the sun in the heat of the day: after the common sort has taken new root, the plants may be placed in a sheltered situation with other hardy exotics, where they may remain till the end of October, when they should either be removed into the green-house or placed under a hot-bed frame, where they may be protected from frost in winter, but enjoy the free air at all times in mild weather. ——The species are.

1. Nerium Oleander; *Common Rosebay*, or *Oleander*. Leaves linear-lanceolate, in threes, transversely nerved underneath; calicine leaflets squarrose; nectaries flat, three-cusped. This species rises with several stalks to the height of eight or ten feet; the branches come out by threes round the principal stalks, and have a smooth bark, which in that with red flowers is of a purplish colour, but in that with white flowers is of a light green. That with the white flowers is the most tender. Other varieties are, the striped-leaved, the broad-leaved double-flowered, the striped double-flowered, and different shades of red from purple to crimson or scarlet. The leaves of Oleander are acrid and poisonous, therefore certainly not proper to be internally used without great caution. Oil, in which the leaves are infused, is recommended in the itch and other cutaneous disorders, in preference to mercurial preparations, for children and delicate constitutions.—Native of the Levant, Spain, Portugal, Italy, by the sides of streams, and near the sea-coast. It abounds every where in the island of Candia by rivers and torrents, and there the variety with white flowers is chiefly found; in the mountains and plains about Antioch or Scanderoon, it is found abundantly; in Sicily, by all the torrents descending from Mount Etna; in many parts of Italy, as between Nice and Genoa; near Monte Baldo, &c.; but particularly in all the low grounds of Magna Grecia in the kingdom of Naples. Belon says, that in Crete, and on Mount Athos, the Rhododendron, which is this shrub, grows to a great size, insomuch that in Crete it is sometimes used for building-timber. It has the name Rhododendron, from the similitude of its flowers in size and colour to the Rose; Rhododaphne, for the same reason, and because, as Gerarde expresses it, it makes a gallant shew like the Bay-tree. Hence also our English name *Rosebay;* which is now superseded by the officinal name *Oleander*, which is adopted in almost all the European languages.—This tree is so hardy as to live abroad in mild winters, if planted in a warm situation; but as they are liable to be destroyed in severe frost, the best way is to keep the plants in pots, or, if they are very large, in tubs, that they may be sheltered in winter, and in the summer removed abroad, placing them in a warm sheltered situation; in the winter it may be placed with Myrtles, and others of the hardier kinds of exotic plants, in a place where they may have as much free air as possible in mild weather, but screened from severe frost; for if these are kept too warm in winter, they will not flower strong, and when the air is excluded from them, the ends of their shoots will become mouldy; so that the hardier they are treated, provided they are not exposed to hard frost, the better they will thrive. The two varieties of this species require a different treatment, otherwise they will not make any appearance; therefore the young plants, when they have taken new root, should be gradually inured to bear the open air, into which they should be removed in July, where they may remain till October, provided the weather continues mild; but during this time, they should be placed in a sheltered situation, and upon the first approach of frost they will change to a pale yellow, and will not recover their usual colour till the following autumn. They may be preserved in a good green-house through the winter, and the plants will be stronger than those which are more tenderly treated; but in May, when the flower-buds begin to appear, the plants should be placed in an open glass-case, where they may be defended from the inclemency of the weather; but when it is warm weather, the air should at all times be admitted to them in plenty. With this management the flowers will expand, and continue long in beauty, and during that time, there are few plant which are equal to them, either to the eye or the nose, for their scent is very like that of the flowers of the White Thorn; and the bunches of flowers will be very large, if the plants are strong.

2. Nerium Odorum; *Sweet-scented Rosebay*, or *Oleander*. Leaves linear-lanceolate, in threes; calicine leaflets erect; nectaries many-parted; segments filiform. This has been confounded with the first species; but it differs in the sweet almond-like scent and paler hue of its flowers, which have a yellow tinge in the middle. It flowers from June to August. There is a variety with the leaves six inches long. The young branches when cut or broken discharge a milky juice or sap; and the larger branches, when burnt, emit a very disagreeable odour.—Mr. Miller informs us, that it is a native of both Indies, and first introduced into the British American Islands from the Spanish Main, where it is called the South Sea Rose. The beauty and sweetness of the flowers induced the inhabitants to cultivate the plants, and in many places to form hedges of them; but many of the cattle that browsed on them were killed, so that they are now only preserved in gardens, where they make a fine appearance through a great part of the year.

3. Nerium Salicinum; *Willow-leaved Rose-bay*, or *Oleander*. Leaves linear-lanceolate, in threes, nerveless. Nearly allied to the first species.—Native of Arabia Felix.

4. Nerium Obesum. Leaves oblong-lanceolate, scattered, villose underneath. Trunk soft, resembling a bulb under ground, the size of a man's head; branches the thickness of the little finger, the same substance as the trunk, attenuated above; when flowering, woody and warted.

5. Nerium Zeylanicum. Leaves lanceolate, opposite; branches straight. Stems round, very dark purple, smooth, erect, swelling at the joints; flowers at the ends of the branches.—Native of the East Indies.

6. Nerium Divaricatum. Leaves lanceolate, ovate; branches divaricating. Stem frutescent, round, decumben

or scandent, ferruginous; branches alternate, divaricating, villose. The wood of this and the above species is proper for the turner, and to make cabinets and other elegant furniture. It is very white, and of a fine grain, like ivory, only much lighter. It mixes admirably with ebony; and is reputed to be a specific in the dysentery.—Native of the East Indies, Japan, and Cochin-china.

7. Nerium Antidysentericum; *Oval-leaved Rose-bay.* Leaves oblong, ovate; panicles terminating. This is a middle-sized tree, with brachiate leaves; flowers herbaceous, or greenish white, in short subterminating racemes; segments of the crown oblong, alternately trifid and linear. The trunk is very irregularly shaped; when very old it is from one and a half to two feet in diameter; but when of that size it is full of large rotten cavities; its height to the branches, when large, is from ten to fifteen feet; the bark of the old wood is scabrous, of the young pretty smooth, and ash-coloured.

The Nerium Tinctorium tree, is a native of the lower regions of the mountains directly north from Coringa, in the Rajahmundry Circar; it contains a mild milky juice, chiefly in the tender branches and young leaves, from which it flows on their being wounded. The natives make scarcely any use of this tree, except for fire-wood; and the more it is cut down, the more it increases, many shoots issuing from the old stumps. These in one year acquire the height of eight or ten feet, and are thick in proportion; it casts its leaves during the cold season, but would probably retain them if in a state of cultivation. About the beginning of the hot season, in March and April, the young leaves begin to make their appearance together with the flowers; by the end of May, those that first begun to be unfolded will have attained to their full size; about this time also it ceases flowering, and the seed-vessels are fully formed, but the seeds are not ripe till January or February. The quick and luxuriant growth of this tree, in its native soil, will be a great inducement to those who wish to cultivate it; which can require little or no trouble: and the soil that it is always found wild in, is the barren, dry, rocky hills, and lower region of mountains, which is totally unfit for every sort of agriculture. The lower parts of the steep rocky mountains of Saint Helena seem to be the very soil and situation it delights in; its size and quick growth will render it valuable there, if it be only for fire-wood; with that view Dr. Roxburgh sent a pretty large quantity of seeds to the Planter's Society on that island. The colour the leaves sometimes acquired in drying for the Hortus Siccus, first induced Dr. Roxburgh to think they were possessed of colouring matter; and the result of some experiments fully answered his expectations, although he had often been deceived in the leaves of other plants. The method he took to extract the colour, was by collecting promiscuously the large and small leaves, while fresh; putting them on the fire in common unglazed earthen pots, with soft well-water, and when scalding hot straining off the liquor, which had acquired a deep green colour, with something of the violet-coloured scum that is observed on the common Indigo, not towards the end of the fermentation: with little agitation this liquor began to granulate; and to promote the granulation as well as the precipitation, he tried various liquors, as cold infusion of Jamblong bark, which is what the Hindoos universally use to precipitate their indigo, lime-water, a lixivium of wood-ashes, a mixture of lime-water and lixivium of wood-ashes, and also a ley made of equal parts of caustic vegetable alkali and quick-lime; these five he repeatedly tried, and as often found that lime-water and a lixivium of wood-ashes, mixed together, answered best; the fæcula was washed, filtrated, and dried in the usual manner. It may be said, that we are already in possession of a sufficient number of good blues, consequently that it is unnecessary to attend to this new Indigo: to obviate this objection, it may be observed, that the common Indigo plant is only to be brought to perfection by nice, expensive, and laborious culture; is liable to many accidents from changes of weather, and other causes that no human foresight can prevent; these are well-known facts to any one that cultivates Indigo to any extent, while this tree is not subject to these inconveniences, and does not require the smallest care, being found in the greatest abundance, growing wild in the most barren tracts that can possibly be imagined, and requires only to be cut down once a year, to make it produce a large supply of young shoots with very luxuriant leaves the following season; besides, the colour that this Indigo may give to cloth, &c. may be different to any other hitherto known, and may therefore prove of great value to a commercial nation like Great Britain.

8. Nerium Coronarium; *Broad-leaved Rose-bay.* Leaves elliptic; peduncles in pairs from the forks of the branches, two-flowered. This is an elegant branched shrub, four feet high, milky, with an ash-coloured bark. The younger branches are shining green, compressed a little, opposite at the end.—Native of the East Indies.

9. Nerium Scandens; *Climbing Rose-bay.* Stem climbing; peduncles terminating, many-flowered; segments of the corolla very long. This is a large shrub, with scandent branches; leaves ovate-oblong, quite entire, subacuminate, smooth, opposite; flowers large, with a white tube and a very red border.—Native of Cochin-china.

Nerteria; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* a superior, very small, undivided rim. *Corolla:* one-petalled, funnel-form, superior; tube short, gradually enlarging; border four-cleft, with sharp segments bent back, and shorter than the tube. *Stamina:* filamenta four, equal, inserted into the base of the corolla, filiform; antheræ oblong, two-lobed, erect. *Pistil:* germen inferior, oval, somewhat compressed, even; styles two, filiform, slightly connate at the base, smooth; stigmas acute, reflex, divaricating. *Pericarp:* berry globular, umbilicate at top, with a very small round scar, two-celled. *Seeds:* solitary, roundish, acuminate at the base, flat on one side, convex on the other. *Observe.* This genus is allied to *Manettia.* Essential Character. *Corolla:* funnel-form, four-cleft, superior. *Berry:* two-celled, *Seeds:* solitary.——The only known species is,

1. Nerteria Depressa. Root fibrous, annual; stems herbaceous, procumbent, rooting at the joints, branched, leafy, filiform, somewhat angular, smooth; branches axillary, opposite, erectr single flowered, short; flowers solitary at the top of the branches, sessile, pale-coloured; bractes two, opposite, acute, very small.—Native of the wet marshy parts of New Grenada, and of New Zealand.

Nettle. See *Urtica.*

Nettle, Dead. See *Lamium.*

Nettle, Hemp. See *Galeopsis.*

Nettle Tree. See *Celtis.*

Neurada; a genus of the class Decandria, order Decagynia.—Generic Character. *Calix:* perianth five-parted, superior, very small. *Corolla:* petals five, equal, larger than the calix. *Stamina:* filamenta ten, the length of the calix; antheræ simple. *Pistil:* germen gibbous, inferior; styles ten, the length of the stamina; stigma simple. *Pericarp:* capsule orbiculate, depressed, convex underneath, defended all over with ascending prickles, ten-celled. *Seeds:* solitary. Essential Character. *Calix:* five-parted. *Petals:*

five. *Capsule:* inferior, ten-celled, ten-seeded, prickly.——The only species yet discovered is,

1. Neurada Procumbens. Stems dispersed, rigid, round, a palm high, or more; branches from each of the lower axils.—Native of Egypt, Arabia, and Numidia.

New Jersey Tea. See *Ceanothus.*

Nicandra; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, thick, coloured, four-parted; segments wide, concave, blunt; the two outside ones larger, and the two internal ones less. *Corolla:* one petalled; tube very short; border deeply ten-cleft; segments oblong, imbricate, curved inwards at top, rigid; nectary a short membranaceous ring, surrounding the base of the germen. *Stamina:* filamenta ten, very short, connected with the nectary, inserted into the receptacle; antheræ linear, four-cornered, acute, erect, approximating. *Pistil:* germen ovate; styles short; stigma peltate, orbicular, six-rayed. *Pericarp:* berry roundish, six-grooved, three-celled. *Seeds:* many, very small, angular. Essential Character. *Calix:* turbinate, coloured, four-parted. *Corolla:* one-petalled, ten-cleft. *Germen:* encircled with a membranaceous ring. *Stigma:* peltate, orbicular, six-rayed. *Berry:* roundish, six-grooved, three-celled, many-seeded.——The only known species is,

1. Nicandra Amara. Stem simple, straight, hard, woody, knotty, the thickness of a finger; leaves simple, entire, smooth, narrow at the base, wide above, round and pointed at the end; flowers terminating, on one, or two, or three peduncles, the base enveloped in a sheath. The corolla is white; the fruit yellow, fleshy, and the size of a cherry. All parts of this plant are bitter: the leaves and tender twigs are used in venereal cases, and where there is suspicion of poison. It is highly emetic in a large dose.—Native of Guiana.

Nicker Tree. See *Guilandina.*

Nicotiana; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, ovate, half five-cleft, permanent. *Corolla:* one-petalled, funnel-form; tube longer than the calix; border somewhat spreading, half five-cleft, in five folds. *Stamina:* filamenta five, awl-shaped, almost the length of the corolla, ascending; antheræ oblong. *Pistil:* germen ovate; style filiform, the length of the corolla; stigma capitate, emarginate. *Pericarp:* capsule subovate, marked with a line on each side, two-celled, two-valved, opening at top; receptacles half ovate, dotted, fastened to the partition; seeds numerous, kidney-form, wrinkled. *Observe.* The acuminate and blunt figure is various in this genus. Essential Character. *Corolla:* funnel-form, with a plaited border. *Stamina:* inclined. *Capsule:* two-valved, two-celled.——The species are,

1. Nicotiana Fruticosa; *Shrubby Tobacco.* Leaves lanceolate, subpetioled, embracing; flowers acute; stem frutescent. It rises with very branching stalks about five feet high. The stalks divide into many smaller branches, terminated by loose bunches of flowers of a bright purple colour, succeeded by acutely pointed seed-vessels. There is a variety about five feet high, the stalk of which does not branch so much as the former.—It is a native of the woods of the island of Tobago. Sir George Staunton informs us, that great quantities of Tobacco are planted in the low grounds of China, through which the embassy passed: and that there is no traditional account of its being introduced into that country, or into India, where it is likewise cultivated, and used in vast abundance. In neither country are foreign usages adopted. It is possible that, like the Ginseng, it may be naturally found in particular spots, both in the old and new world. In China, where the use of Tobacco both in snuff and for smoking is very general, buildings are not thought necessary, as they are in the West Indies, for curing it; there being little apprehension of rain to injure the leaves when plucked. They are hung on cords to dry without any shelter, upon the spot in which they grew. Each owner with his family takes care of his own produce. This indicates both the nature of the climate, little subject to moisture, and the general division of property into minute parcels. Tobacco is cultivated in open fields in several parts of the continent of Europe; and some think it might be advantageously grown in England, if it were not prohibited by the legislature. All the species however, except the third and fourth, require the same culture, and are too tender to grow from seeds sown in the full ground to any degree of perfection in this country, but must be raised on a hot-bed. The seeds must be sown in March, and when the plants are come up fit to remove, they should be transplanted into a new hot-bed of a moderate warmth, about four inches asunder each way, observing to water and shade them until they have taken root; after which let them have air in proportion to the warmth of the season, as without it they will draw up very weak, and be thereby less capable of enduring the open air: water them frequently, but in small quantities; while they are very young, it should not be given to them in too great quantities, though, when they are grown strong, they will require to have it often and in abundance. In this bed the plants should remain till the middle of May, by which time, if they have succeeded well, they will touch each other; therefore they should be inured to bear the open air gradually; after which they must be taken up carefully, preserving a large ball of earth to each root, and planted into a rich light soil in rows four feet asunder, and the plants three feet distance in the rows, observing to water them until they have taken root; after which they will require no further care, except weeding, until they begin to shew their flower-stems; when their tops should be cut off, that their leaves may receive more nourishment, and become larger and of a thicker substance. In August they will be full grown, when they should be cut for use; for if they be permitted to stand longer, their under leaves will begin to decay. This is to be understood of such plants as are propagated for use; but those designed for ornament should be planted in the borders of the pleasure garden, and permitted to grow their full height, where they will continue flowering from July till the frost puts a stop to them.

2. Nicotiana Tabacum; *Virginian Tobacco.* Leaves lanceolate, ovate, sessile, decurrent; flowers acute. Root large, long, annual; stalk hairy, upright, strong, round, branching towards the top; leaves numerous, large, pointed, entire, veined, viscid, pale green; bractes long, linear, pointed; flowers in loose clusters or panicles; calix hairy, about half the length of the corolla, cut into five narrow segments; tube of the corolla hairy, gradually swelling towards the border, where it divides into five folding acute segments of a reddish colour; capsule ovate, conical, clothed with the calix, smooth, with four depressed streaks, two-celled, opening four ways at top; partition simple, contrary to the valves; receptacle very large, fungous, ovate-acuminate, convex on one side, and flat on the other, or reniform, concave, fastened on both sides to the partition; seeds very numerous, small, ovate, subreniform, with raised lines or nerves beautifully netted of a yellowish bay colour. Mr. Millar describes three species of Virginian Tobacco: 1. The Great Broad-leaved, which he says was formerly the most commonly sown in England, and has been generally taken for the Common Broad-leaved Tobacco of Caspar Bauhin and others, but is very different from it.

The leaves are more than a foot and half long, and a foot broad, their surfaces very rough and glutinous, and their bases half embrace the stalk. In a rich moist soil the stalks are more than ten feet high, and the upper part divides into smaller branches, which are terminated by loose bunches of flowers, standing erect; they have pretty long tubes, and are of a pale purplish colour. It flowers in July and August, and the seeds ripen soon after. This is the sort which is commonly brought to market in pots, and by some is called Oroonoko Tobacco. 2. The stalks of the next of Mr. Miller's species seldom rise more than five or six feet high, and divide into more branches. It is the Broad-leaved Tobacco of Caspar Bauhin. The leaves are about ten inches long, and three and a half broad, smooth, acute, sessile; the flowers are rather larger, and of a bright purple colour. It flowers and perfects seeds at the same time; and is often called Sweet-scented Tobacco. 3. Narrow-leaved Virginian Tobacco, rises with an upright branching stalk, four or five feet high; the lower leaves are a foot long, and three or four inches broad; those on the stalks are much narrower, lessening to the top, and end in very acute points, sitting very close to the stalks; they are very glutinous. The flowers grow in loose bunches at the top of the stalks, they have long tubes, and are of a bright purple or red colour. They appear at the same time with the former, and ripen their seeds in the autumn. They are all natives of America.—Linneus informs us that Tobacco was known in Europe from the year 1560, when it was brought into Spain and Portugal, and derived its name from Nicot, the Spanish ambassador at the Portuguese court, who sent it to Catharine de Medicis as a plant of the new world possessing *extraordinary* virtues. Andrew Thevet, however, who was almoner to the above Queen, and returned from Brazil in 1556, disputes the claim of Nicot, and probably was the first importer of this noxious weed. The filthy practices of chewing and smoking Tobacco, and of taking it up the nose in snuff, have now prevailed in civilized Europe for more then two centuries, notwithstanding their injurious effects upon the health and appearance of those who indulge such uncleanly and pernicious habits, and the great expense attending their indulgence. For the full history, and a most interesting account of this famous herb, we refer our readers to Dr. Adam Clarke's *Dessertation on the Use and Abuse of Tobacco*, from which we forbear to quote any part, because every lover of decency and order ought to be in possession of the whole; and should by all means endeavour to dissuade his fellow creatures from acquiring such slavish and disgusting habits. It is really surprising that in a country like ours, where the influence of the ladies is so exceedingly great, that England has been justly termed their earthly Paradise, that with all their influence they should not have succeeded in persuading their husbands, parents, and brothers, to abstain for their sakes from the use of a weed which discolours and destroys the teeth, taints the breath, and gives an unwholesome appearance to the whole person, besides seriously injuring the health. Our fair countrywomen are certainly no advocates for such sottish customs, which we rejoice to say are of late years gradually vanishing from among those who think for themselves, and will, it is ardently hoped, be finally proscribed by the decent and rational part of mankind. Tobacco, it is well known, is of a narcotic quality: even a small quantity, snuffed up the nose, will sometimes produce giddiness, stupor, and vomiting; and when applied by different ways in larger quantities, there are many instances of its more violent effects, and even of its proving a mortal poison. It operates in the same way as other narcotics, but also possesses a strongly stimulant power, perhaps with respect to the whole system, but especially over the stomach and intestines, so as readily, even in small doses, to prove emetic and purgative. Hence it is sometimes employed to excite vomiting, but more commonly as a purgative in clysters, or by throwing the smoke up the anus. An infusion of Tobacco-leaves has been advantageously used as a lotion for obstinate ulcers; but many instances having occurred, in which, being absorbed, it has proved a violent poison, we dissuade from such a practice, especially as there are other medicines of as much efficacy, that may be employed with more safety. Bergius recommends it for a fomentation in the paraphymosis. The smoke has been successfully used in the way of injection, for obstructions and inveterate constipations of the belly, ever since the time of Sydenham, and is also recommended in cases of suspended animation.—In America, when a regular plantation of Tobacco is intended, the beds being prepared, and well turned up with the hoe, the seed, on account of its smallness, is mixed with ashes, and sown upon them a little before the rainy season. The beds are raked or trampled with the feet, to make the seed take the sooner. The plants appear in two or three weeks. So soon as they have acquired four leaves, the strongest are drawn up carefully, and planted in a field by a line, at the distance of about three feet from each plant. If no rain fall, they should be watered two or three times. Every morning and evening the plants must be looked over, in order to destroy a worm which sometimes invades the bud. When they are about four or five inches high, they are to be cleaned from weeds, and moulded up. As soon as they have eight or nine leaves, and are ready to put forth a stalk, the top is nipped off, in order to make the leaves longer and thicker. After this, the buds which sprout at the joint of the leaves are all plucked; and not a day is suffered to pass without examining the leaves, to destroy a large caterpillar which is sometimes very destructive to them. When they are fit for cutting, which is known by the brittleness of the leaves, they are cut with the knife close to the ground; and, after lying some time, are carried to the drying shed or house, where the plants are hung up by pairs upon lines, leaving a space between them that they may not touch one another. In this state they remain to sweat and dry. When perfectly dry, the leaves are stripped from the stalks, and made up in small bundles tied into one of the leaves. These bundles are laid in heaps, and covered with blankets. Care is taken not to over-heat them, for which reason the heaps are laid open to the air from time to time, and spread abroad. This operation is repeated till no more heat is perceived in the heaps, and the Tobacco is then stowed in casks for exportation.

3. Nicotiana Rustica; *Common Green Tobacco.* Leaves petioled, ovate, quite entire; flowers obtuse, of a dull yellowish-green; stalks seldom more than three feet high. This is commonly called English Tobacco, from its having been the first introduced here, and being much more hardy than the other sorts, insomuch that it has become a weed in many places: it came however originally from America, by the name of *Petum.* Every part is downy, clammy, and fetid. Gerard says of it, that "taken in smoke, it worketh the same kind of drunkenness that the right Tobacco doth."—This and the next species may be propagated by sowing their seeds in March, upon a bed of light earth, whence they may be transplanted into any part of the garden, and will thrive without further care.

4. Nicotiana Paniculata; *Panicled Tobacco.* Leaves petioled, cordate, quite entire; flowers panicled, blunt, club-shaped; stalk three feet high and upwards.—Native of Peru. See the preceding species.

5. Nicotiana Urens; *Stinging Tobacco.* Leaves cordate, crenate; racemes recurved; stem hisped, stinging.—Native of South America. This and the two following species, being somewhat more tender than the others, should be sown early in the spring on a hot-bed: when the plants are come up, transplant them on another moderate hot-bed; water them duly, and give them a large share of air in warm weather; and when the plants have obtained a good share of strength, transplant them into separate pots, and plunge them into a moderate hot-bed, to bring them forward. About the middle of June, some of the plants may be shaken out of the pots, and planted in beds of rich earth; but it will be proper to keep one or two plants in pots, to be placed in the stove, in case the season should prove bad, that they may ripen their seeds.

6. Nicotiana Glutinosa; *Clammy-leaved Tobacco.* Leaves petioled, cordate, quite entire; flowers in racemes, pointing one way, and ringent; stalk round, nearly four feet high, sending out two or three branches from the lower part.—Native of Peru.

7. Nicotiana Pusilla; *Primrose-leaved Tobacco.* Leaves oblong-oval, radical; flowers in racemes, acute; root pretty thick, and taper, striking deep in the ground, at the top of it come out six or seven leaves, spreading on the ground, about the size of those of the common Primrose, but of a deeper green; stalk about a foot high.—Native of La Vera Cruz.

8. Nicotiana Quadrivalvis. Leaves oblong-ovate, petiolate; flowers on the top of the branchlets scattered, solitary; corolla funnel-shaped; segments oblong; capsules subglobose, four-valved; colour of the flowers white, with a tinge of blue. The tobacco prepared from it, is said to be of a superior quality, and the Indians prepare the most delicate sort from the dried flowers.—It is cultivated, and also grows spontaneously, on the Missouri, principally among the Mandan and Ricara nations.

Nidus Avis. See *Ophrys.*

Nigella; a genus of the class Polyandria, order Pentagynia.—Generic Character. *Calix:* none. *Corolla:* petals five, ovate, flat, blunt, spreading, more contracted at the base; nectaries eight, placed in a ring, very short; each two-lipped; outer lip larger, lower bifid, flat, convex, marked with two dots; inner lip shorter, narrower, from ovate ending in a line. *Stigma:* filamenta numerous, awl-shaped, shorter than the petals; antheræ compressed, blunt, erect. *Pistil:* germina several, (five or ten,) oblong, convex, compressed, erect, ending in styles which are awl-shaped, angular, very long, but revolute, permanent; stigmas longitudinal, adnate. *Pericarp:* capsules as many as there are germina, oblong, compressed, acuminate, connected on the inside by the suture, gaping on the inside at top; seeds very many, angular, rugged. *Observe.* The fifth species has ten pistils, straight, longer than the corolla; seeds membranaceous, margined. The fourth species has also ten pistils, equalling the corolla. Essential Character. *Calix:* none. *Petals:* five; nectaries five or more, two-lipped, within the corrolla. *Capsules:* as many, connected; according to Gærtner, separate, beaked, opening inwards.—All the plants of this genus may be propagated by sowing their seeds upon a bed of light earth, where they are to remain, for they seldom succeed well if transplanted; therefore, in order to have them intermixed among other annual flowers, in the borders of the flower-garden, the seed should be sown in patches, at proper distances; and when the plants appear, pull up those which grow too close, leaving but three or four of them in each patch, observing also to keep them clear from weeds; which is all the culture they require. In July they produce their flowers, and ripen seeds in August, when they should be gathered and dried; then rub out each sort separately, and preserve them in a dry place. The season for sowing these seeds is in March; but if you sow some of them in August, soon afer they are ripe, upon a dry soil, and in a warm situation, they will abide through the winter, and flower strong through the succeeding year; by sowing the seeds at different times, they may be continued in beauty most part of the summer. The varieties with double flowers, are chiefly sown in flower-gardens; those with single flowers are rarely admitted into any but botanic gardens. They are all annual plants, perishing soon after they have perfected their seeds; which, if permitted to scatter upon the borders, will come up without any further care.——The species are,

* *With five Styles.*

1. Nigella Damascena; *Common Fennel Flower.* Flowers surrounded with a leafy involucre. Stalk upright, branching, a foot and half high; colour of the flowers pale blue. There is a variety with single white flowers, and another with double flowers, which is frequently sown in gardens, along with other annuals, for an ornament. From the fine-cut leaves about the flowers, it has the names of Fennel-flower, Devil-in-a-bush, and Love-in-a-mist, but the first has become obsolete. The expressed juice of this plant is excellent for the head-ache, for which purpose it is to be snuffed up the nose; it excites sneezing, and a considerable discharge of mucus and watery humours from the head; taken inwardly, it increases the urinary secretion, and relieves the jaundice.—Native of corn-fields in the South of Europe.

2. Nigella Sativa; *Small Fennel Flower.* Pistils five: capsules muricated, roundish; leaves somewhat hairy. This rises to the same height as the preceding. Its seeds were formerly much used as carminative, stimulant, and errhine; but though they are no longer employed medicinally, they are still used, in some parts of Germany and Asia, for culinary purposes instead of spice, as they are pleasantly aromatic. It flowers from June to September.—Native of Candia and Egypt.

3. Nigella Arvensis; *Field Fennel Flower.* Pistils five; petals entire; capsules turbinate. Stalks slender, nearly a foot high, either single or branching out at the bottom; each branch is terminated by one star-pointed flower of a pale blue colour, without any leafy involucre. There is a variety with white flowers, and another with double flowers; they appear from June to September.—Native of Germany, France, Italy, Carniola, and Switzerland.

** *With ten Styles.*

4. Nigella Hispanica; *Spanish Fennel Flower.* Pistils ten, equalling the corolla; stalk a foot and half high. The flowers are larger than those of the other species, and of a fine blue colour, with green veins at the back. There is a variety of it with double flowers. It flowers from June to September.—Native of Spain and the south of France.

5. Nigella Orientalis; *Yellow Fennel Flower.* Pistils ten, longer than the corolla; stalk branching, a foot and half high, with pretty long leaves, finely divided. The flowers are produced at the ends of the branches. It flowers from July to September.—Native of corn-fields in Syria.

Nightshade. See *Solanum.*

Nightshade, Deadly. See *Atropa.*

Nightshade, Enchanter's. See *Circæa.*

Nightshade, Malabar. See *Basella.*

Nipa; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male Flowers:* lateral, below the females, on the same plant. *Calix:* spathes oblong, concave, acuminate, coriaceous; outer larger, inner gradualyl inclosing; perianth proper none. *Corolla:* petals six, linear, equal, from spreading reflex. *Stamina:* filamentum one,

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filiform, erect, the length of the petals; anthera at the top of the filamentum, perforated, twelve-grooved, oblong. *Female flowers*, terminating. *Calix:* spathes as in the male. *Corolla:* none. *Pistil:* germen angular, often five-angled, obliquely truncate, smooth; style and stigma none, but in their stead a groove on each side. *Pericarp:* drupes very many, aggregate in a head, the size of the human head, angular; angles unequal, acute or blunt, attenuated below, blunted above, and smooth. Essential Character. *Male:* spathe. *Corolla:* six-petalled. *Female:* spathe. *Corolla:* none. *Drupes:* angular.——The only known species is,

1. Nipa Fruticans. Trunk in the young Palm none, but in an adult state some feet in height; leaves pinnate; pinnas striated, margined, acuminate, smooth. Flowers male and female, on the same plant, but distinct on different peduncles. The fruit is eaten both raw and preserved.—Native of Java, and other islands in the East Indies, where the leaves are used for covering houses and making mats.

Nipplewort. See *Lapsana.*

Nissolia; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-toothed, with the upper teeth deeper. *Corolla:* papilionaceous; banner roundish, subemarginate, reflex, with the edges folded back; wings oblong, blunt, erect, broader at top, spreading in front; keel closed, of the same form with the wings. *Stamina:* filamenta ten, united into a cylinder, cloven above; antheræ roundish. *Pistil:* germen oblong, compressed; style awl-shaped, ascending at a right angle; stigma capitate, obtuse. *Pericarp:* capsule oblong, round, of two or three joints, running out into a ligulate wing. *Seed:* one in each joint, oblong, round, blunt. Essential Character. *Calix:* five-toothed. *Capsule:* one seeded, ending in a ligulate wing.——The species are,

1. Nissolia Arborea; *Tree Nissolia.* Stem arboreous, erect. This is an inelegant tree, twelve feet high, the branches of which being often weak and bending, require support. Leaves deciduous, pinnate or ternate.—Native of Carthagena in New Spain; where it is found flowering in the woods in July and August.

2. Nissolia Fruticosa; *Shrubby Nissolia.* This is a thornless shrub, with numerous twining stems and branches, climbing the trees to the height of fifteen feet. Leaves numerous, alternate, pinnate, subvillose; flowers peduncled, small, yellow, inodorous.—Native of Carthagena, in woods and coppices; flowering in September.

Nitraria; a genus of the class Dodecandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, erect, very short, permanent. *Corolla:* petals five, oblong, spreading, channelled, arched at top with an inflex dagger-point. *Stamina:* filamenta fifteen, awl-shaped, almost erect, the length of the corolla; antheræ roundish. *Pistil:* germen ovate, ending in a thickish style, longer than the stamina; stigma simple. *Pericarp:* drupe one-celled, ovate-oblong, acuminate. *Seed:* nut solitary, three-celled, ovate, acuminate. *Observe.* The germen when immature is three-celled; nut scrobiculate, one-celled, six-valved at top; style very short, trifid. Essential Character. *Calix:* five-cleft. *Corolla:* five-petalled, with the petals arched at top. *Stamina:* fifteen or more. *Drupe:* one-seeded.——The only known species is,

1. Nitraria Schoberi; *Thick-leaved Nitraria.* There are two varieties of this shrub; one in the squalid nitro saline parts of the desert extending from the north of the Caspian Sea; the stems of which are nearly upright, almost unarmed; it is also the largest in all its parts. The other, is found in the salt plains of Siberia, between the rivers Irtis and Obo, by the salt lakes near the Jenisca, and beyond the lake Baikal. It is prostrate, tender, thorny, and smaller than the other in all its parts. Pallas informs us, that the berries, though saltish and insipid, are eaten in the Caspian desert, and are almost the only luxury in that arid soil. Linneus had this shrub twenty years, before it flowered in Sweden: and during ten years having in vain tried to make it flower in the garden at Upsal, he at length succeeded, by watering it with salt water.

Nolana; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate at the base, five-parted, five-cornered; segments cordate, acute, permanent. *Corolla:* one-petalled, bell-shaped, plaited, spreading, somewhat five-lobed, twice as large as the calix. *Stamina:* filamenta five, awl-shaped, erect, equal, shorter than the corolla; antheræ sagittate. *Pistil:* germina five, roundish; style among the germina, cylindric, straight, the length of the stamina; stigma capitate. *Pericarp:* properly none. According to Gærtner, drupes five, decumbent, three or five celled. *Seeds:* five, with a succulent rind, roundish, with the inner base naked, immersed in the receptacle, two-celled, and four-seeded. Essential Character. *Corolla:* bell-shaped. *Style:* among the germina. *Seeds:* five, berried, two-celled. According to Gærtner, drupes five, three or five celled, with one seed in each cell. ——The only known species is,

1. Nolana Prostrata; *Trailing Nolana.* Root annual, simple, filiform, often three feet long, blackish; stem a foot long, herbaceous, prostrate, roundish, very smooth, with white dots scattered over it; branches alternate, the lower ones the length of the stalk; leaves alternate, two together, reflex, rhomb-ovate, quite entire, blunt, somewhat fleshy, an inch long; flowers inferior; corolla of a fine blue colour, with dark purple veins at the throat; calix pale purple. It flowers in July, and ripens seed in September.—Native of Peru. To propagate it, the seeds should be sown on a hot-bed in March. When the plants are fit to remove, transplant them singly into small pots filled with light earth, and plunge them into a fresh hot-bed to bring the plants forward, otherwise they will not ripen their seeds in this country. When their flowers open in July, they should have a large share of air admitted to them when the weather is warm, to prevent their flowers from falling away without producing seeds. With this management, the plants will continue flowering till the early frosts destroy them; and ripe seeds will be produced in the beginning of September.

Noli me Tangere. See *Impatiens.*

None-so-pretty. See *Saxifraga.*

None-such. See *Medicago Lupulina.*

Nose-bleed. See *Achillea Ptarmico.*

Nursery.—Upon this subject, so important to all farmers and gardeners, and to the public in general, we shall subjoin the observations of the celebrated Philip Miller at full length. He defines the nursery-garden to be a piece of land set apart for the raising and propagating all sorts of trees and plants to supply the gardens and plantations. Of this kind there is an immense number in various parts of the kingdom, but especially in the neighbourhood of London, which are occupied by the gardeners, whose business it is to raise trees, plants, and flowers, for sale; and in many of these there is at present a much greater variety of trees and plants cultivated than can be found in any other part of Europe. But I do not, says Mr. Miller, propose to treat of these extensive nurseries, nor to give a description of them, and shall confine myself to such nurseries only as are absolutely necessary for all lovers of planting to have upon the spot where they

design to make their plantation. For if these are large, the expense of carrying a great number of trees, if the distance be great, will be no small expense, besides the hazard of their growing; which when the plants have been trained up in good land, and removed to an indifferent one, is very great. Therefore it is of the utmost consequence to every planter to begin by making a nursery. But in this article I must beg leave to observe, that a nursery should not be fixed to any particular spot: I mean by this, that it would be wrong to continue the raising of trees any number of years upon the same spot of ground, because hereby the ground will be so much exhausted by the trees, as to render it unfit for the same purpose. Therefore all good nursery gardeners shift and change their land from time to time, for when they have drawn off the trees from a spot of ground they plant kitchen herbs, or other things, upon the ground, for a year or two; by which time, as also by dunging or trenching the land, it is recovered, and make fit to receive other trees. But this they are obliged to from necessity, being confined to the same land; which is not the case with those gentlemen who have large extent of ground in the country. Therefore I would advise all such persons to make nurseries upon the ground which is intended for planting, where a sufficient number of trees may be left standing after the others have been drawn out to plant in other places; which, for all large-growing trees, but particularly such as are cultivated for timber, will be found by much the most advantageous method; for all those trees which come up from the seed, or which are transplanted very young into the places where they are designed to remain, will make a much greater progress, and become larger trees, than any of those which are transplanted at a greater age. Therefore the nurseries should be thinned early, by removing all those trees which are intended for other plantations while they are young, because hereby the expense and trouble of staking, watering, &c. will be saved, and the trees will succeed much better. But in exposed situations, where there are nurseries made, it will be necessary to permit the trees to stand much longer, that by growing close together they may shelter each other, and draw themselves up; and these should be thinned gradually as the trees advance, for by taking away too many at once the cold will check the growth of the remaining trees. But then those trees which are taken out from these nurseries, after a certain age should not be depended on for planting; and it will be prudent rather to consign them for fuel than to attempt to remove them large, whereby in endeavouring to get them up with good roots, the roots of the trees left standing will often be much injured. What has been here proposed must be understood for all large plantations in parks, woods, &c. but those nurseries which are only intended for raising evergreens, flowering shrubs or plants, which are designed to embellish gardens, may be confined to one spot, because a small compass of ground will be sufficient for this purpose. Two or three acres of land employed this way, will be sufficient for the most extensive designs, and one acre will be full enough for those of moderate extent. And such a spot of ground may be always employed for sowing the seeds of foreign trees and plants, as also for raising many sorts of biennial and perennial flowers to transplant into the borders of the pleasure-garden, and for raising many kinds of bulbous-rooted flowers from seeds; whereby a variety of new sorts may be obtained annually, which will recompense for the trouble and expense, and will also be an agreeable diversion to all those persons who delight in the amusements of gardening. Such a nursery as this should be situated conveniently for water; for where that is wanting, there must be an expense attending the carriage of water in dry weather. It should also be as near the house as it can with conveniency be admitted, in order to render it easy to visit at all times of the year, because it is absolutely necessary it should be under the inspection of the master, for unless he delights in it there will be little hopes of success. The soil of this nursery should also be good, and not too heavy and stiff, for such land will be very improper for sowing most sorts of seeds; because as this will detain the moisture in the spring and winter, the seeds of most tender things, especially of flowers, will rot in the ground, if sown early; therefore where persons are confined to such land, there should be a good quantity of sand, ashes, and other light manures, buried, in order to separate the parts, and pulverize the ground: and if it be thrown up in ridges to receive the frost in winter, it will be of great use to it, as will also the frequent forking or stirring of the ground, both before and after it is planted. The many advantages which attend the having such a nursery, are so obvious to every person who has turned his thoughts in the least to this subject, that it is needless for me to mention them here; and therefore I shall only repeat here what I have so frequently recommended, which is the carefully keeping the ground always clean from weeds; which would soon rob the young trees of their nourishment. Another principal business is to dig the ground between the young plants at least once every year, to loosen it for the roots to strike out; but if the ground is stiff, it will be better if it is repeated twice a year, in October and March, which will greatly promote the growth of the plants, and prepare their roots for transplanting. But there may be many persons who have the curiosity to raise their own fruit-trees, which I would recommend to every lover of good fruit, because the uncertainty of procuring the intended kinds of each fruit is very great, when taken from the common nursery gardens, so that most gentlemen who have planted many, have constantly complained of this disappointment; but besides this there is another inconvenience, which for want of skill is scarcely taken notice of, which is, the taking the buds or grafts from young trees in the nurseries which have not borne fruit; this having been frequently repeated, renders the trees so raised as luxuriant as willows, making shoots to the top of the wall in two or three years, and hardly ever become fruitful with the most skilful management. I shall therefore treat of the proper method to make a nursery of these trees; in the doing which the following rules must be observed. 1. That the soil in which you make the nursery, be not better than that where the trees are to be planted out for good; the not observing this is the reason that trees are often at a stand, or make but little progress, for three or four years after they come from the nursery, as it commonly happens to such trees as are raised near London, and carried into the northern parts of England, where, being planted in a poor soil and a much colder situation, the trees seldom succeed well; therefore it is by far the better method, when you have obtained the sorts you would wish to propagate, to raise a nursery of the several sorts of stocks proper for the various kinds of fruit, upon which you may bud or graft them; and those trees which are thus raised upon the soil, and in the same degree of warmth, where they are to be planted, will succeed much better than those brought from a greater distance and from a richer soil. 2. This ground ought to be fresh, and not such as has been already worn out by trees, or other large-growing plants; for in such soil your stocks will not make any progress. 3. It ought never to be too wet, nor over dry, but rather of a middling nature; though of the two extremes a dry is to be preferred, because in such

soils, though the trees do not make so great a progress as in moist, yet they are generally sounder, and more disposed to fruitfulness. 4. Observe to inclose it, that cattle and vermin may be excluded; for they make sad havoc with young trees, particularly in winter, when the ground is covered with snow, and they have little other food which they can come at. Some of the most mischievous, are hares and rabbits, which devour the bark, and soon destroy the trees. The ground being inclosed, should be carefully trenched about eighteen inches or two feet deep, provided it will allow it; this should be done in August or September, that it may be ready to receive young stocks at the season for planting, which is commonly in the middle or end of October. In trenching the ground, be careful to cleanse it from the roots of all noxious weeds, such as Couch-grass, Docks, &c. which, if left in the ground, will get in among the roots of the trees, so as not to be gotten out afterwards, and will spread and overrun the ground, to the great prejudice of your young stocks. After having dug the ground, and the season being come for planting, you must level down the trenches as equal as possible, and then lay out the ground into quarters proportionable to the size thereof, and those quarters may be laid out in beds for the sowing of seeds, or the stones of fruit. The best sorts of stocks for Peaches, Nectarines, &c. are such as are raised from the stones of the Muscle and White Pear Plumb, but you should never plant suckers of these, (which is what some people practise,) for they seldom make so good stocks, nor are ever well-rooted plants; besides, they are very subject to produce great quantities of suckers from their roots, which are very troublesome in the borders or walks of a garden, and greatly injure the tree; so that you should annually, or at least every other year, sow a few stones of each, that you may never be at a loss for stocks. For Pears, you should have such stocks as have been raised from the kernels of the fruit where perry has been made, or else preserve the seeds of some sorts of summer pears, which generally shoot strong and vigorous, as the Cuisse Madame, Windsor, &c. but when this is intended, the fruit should be suffered to hang upon the trees till they drop, and afterwards permitted to rot; then take out the kernels and put them in sand, being careful to keep them from vermin, as also to place them where they may not grow damp, which will make them mouldy. These should be sown for stocks early in the spring, upon a bed of good light fresh earth, where they will come up in about six weeks, and, if kept clear from weeds, will be strong enough to transplant in October following. But for many sorts of summer and autumn Pears, Quince stocks are preferable to free stocks, that is, Pear stocks. These are generally used for all the sorts of soft melting Pears, but they are not so good for the breaking Pears, being apt to render those fruits which are grafted upon them stony; these are very often propagated from suckers, which are generally produced in plenty from the roots of old trees; but those are not near so good as such as are propagated from cuttings or layers, which have always much better roots, and are not so subject to produce suckers as the other; which is a very desirable quality, since these suckers do not only rob the trees of great part of their nourishment, but are very troublesome in a garden. Apples are grafted or budded upon stocks raised from seeds which come from the cider press, or upon Crab-stocks, the latter of which are esteemed for their durableness, especially for large standard trees; these should be raised from seeds, as the pear-stock, and must be treated in the same manner, for those procured from suckers, &c. are not so good: the Paradise stock has been greatly esteemed for small gardens; it being of very humble growth, causes the fruit trees grafted or budded thereon to bear very soon, and they may be kept in small compass; but they are only proper for very small gardens, or by way of curiosity, since the trees thus raised are but of short duration; and seldom arise to any size to produce fruit in quantities, unless the graft or bud be buried in planting, so that they put forth roots; and then they will be equal to trees grafted upon free stocks, since they receive but small advantage from the stock. For Cherries, stocks should be raised from the stones of the common Black or the Wild Honey Cherry, both of which are strong free growers, and produce the cleanest stocks. For Plums, you may use the stones of most free-growing sorts; which will also do very well for Apricots, these being less difficult to take than Peaches and Nectarines; but these ought not to be raised from suckers, for the reason before assigned, but from stones. There are some persons who recommend the Almond stock for several sorts of tender Peaches, upon which they will take much better than upon Plum stocks; but these being tender in their roots, and apt to shoot early in the spring, and being also of short duration, are by many people rejected; but such tender sorts of Peaches which will not take upon Plum stocks, should be budded upon Apricots, upon which they will take very well; and all sorts of Peaches which are planted upon dry soils, will continue much longer, and not be so subject to blight, if they are upon Apricots; for it is observed, that upon such soils where Peaches seldom do well, Apricots will thrive exceedingly, which may be owing to the strength and compactness of the vessels in the Apricots, which render it more capable of assimilating, or drawing its nourishment from the Plum stock, which in dry soils seldom afford it in great plenty to the buds; and the Peach-tree being of a loose and spongy nature, is not so capable of drawing its nourishment therefrom, which occasions that weakness which is commonly observed in those trees when planted on a dry soil; therefore it is the common practice of the nursery gardeners, to bud the Plum stock either with Apricots or some free-growing Peach; and after these have grown a year, they bud the tender sorts of Peaches upon these shoots: by which method many sorts succeed well, which in the common way will not thrive, or scarce keep alive; and the gardeners call these Double-worked Peaches, The budding and grafting of Cherries upon stocks of the Cornish and Morello Cherry, produces the same effect as the Paradise stock upon Apples. Having provided young stocks of all these different sorts, which should be raised in the seminary the preceding year, they must be transplanted into the nursery in October. If intended for standards, they should be planted three feet and a half or four feet row from row, and at a foot and half distance in the row; but if for dwarfs, three feet row from row, and one foot in the row, will be a sufficient distance. In taking these stocks out of the seed-beds, you must raise the ground with a spade, in order to preserve the roots as entire as possible; then with your knife prune off all the very small fibres; and if there be any which have a tendency to root downright, such roots should be shortened: having thus prepared the plants, draw a line across the ground intended to be planted, and with your spade open a trench thereby exactly straight, into which place them at the distance before mentioned, setting them exactly upright, and then put the earth in close to them, filling up the trench, and with your foot press the earth gently to the roots of them, observing not to displace them so as to make the rows crooked, which will render them unsightly: these plants should by no means be headed or pruned at top, which will weaken them, and cause them

to produce lateral branches, by which they are spoiled. If the winter should prove very cold, it will be of great service to your young stocks, to lay some mulch upon the surface of the ground near their roots, which will prevent the frost from penetrating the ground, so as to hurt the tender fibres which were produced after planting: but you should be careful not to let it lie too thick near the stems of the plants, nor remain too long, lest the moisture should be prevented from penetrating to the roots of the plants, which it often does where there is not due care taken to remove it as soon as the frost is over. In thesummer, hoe and destroy the weeds, which if permitted to remain in the nursery, will greatly weaken and retard the growth of your stocks; and in the succeeding years, dig up the ground every spring between the rows, which will loosen it so that the fibres may easily strike out on each side, and the weeds will thereby be destroyed. If any of the stocks have put forth lateral branches, prune them off, that they may be encouraged to grow upright and smooth. The second year after planting, such of the stocks as are designed for dwarf trees will be fit to bud, but those which are designed for standards should be suffered to grow six or seven feet high before they are budded or grafted. See *Inoculation* and *Grafting*. The stocks which were budded in summer and have failed, may be grafted the following spring; but Peaches and Nectarines never take well from grafts, and should therefore be always budded.—The ground reserved for the Flower Nursery should be well situated to the sun, but defended from strong winds by plantations of trees or buildings, and the soil should be light and dry; which must always be observed, especially for bulbous-rooted flowers, which are designed to be planted therein, the particulars of which are exhibited under the several articles of flowers. In this part of the nursery should be planted the offsets of all bulbous-rooted flowers, where they are to remain until they become blowing roots, when they should be removed into the pleasure-garden, and planted either in beds or borders, according to the goodness of the flowers, or the management which they require. In this ground also the different sorts of bulbous-rooted flowers may be raised from seed, by which means new varieties may be obtained; but most people are discouraged from setting about this work, from the length of time before the seedlings will come to flower: but notwithstanding this, after a person has once begun, and continues sowing every year, after the parcel first sown has flowered, the regular succession of them coming annually to flower will not render this method so tedious as it at first appeared. The seedling Auriculas, Polyanthuses, Ranunculuses, Anemonies, Carnations, &c. should be raised in this nursery, where they should be preserved until they have flowered; then mark all that are worth transplanting into the flower-garden, which should be done in their proper seasons; for it is not so well to have all these seedling flowers exposed to public view in the flower-garden, because there are a great number of ordinary flowers produced among them, which would make but an indifferent appearance in the pleasure-garden.——For a Nursery, Dr. Hunter recommends a rich, deep, and stiffish mould, though the trees should afterwards be removed into a poorer soil. Reason, says he, teaches that young trees growing luxuriantly and freely in a good soil, will form vigorous and healthy roots; and when they come to be afterwards planted in worse land, they will be able from the strength of their constitution to feed themselves freely with coarse food. On the contrary, young trees raised upon poor land, by having their vessels contracted, and their outward bark mossy and diseased, will be a long time, even after being removed to a rich soil, before they attain to a vigorous state. Having fixed upon a proper place, of a sufficient size for the purpose, fence it with hedges, pales, or walls, to keep out cattle, hares, and rabbits; then in October or November trench the land two spits deep, and in spring turn it over again; after which, let the surface be laid smooth, and set out into quarters. A very judicious planter, adds Dr. Hunter, recommended to him the following method of making a seminary or nursery for forest trees. Trench the ground in November eighteen inches deep, if the soil will admit of it; but where the staple is too thin, one foot will be sufficient, in which case the sward must be pared off very thin, and laid in the bottom of the trench. The following year let this land be cultivated with a crop of cabbages, turnips, or rape, which must be eaten off with sheep. After this, a common digging will be sufficient, previously to its being formed into beds for the reception of the seeds. The urine of the sheep is one of the most cherishing manures for all plants raised in a seminary or nursery. The soil of the nursery, according to Mr. Marshall, should be rich and deep, and should be prepared by double diggings and other meliorations: if not deep and rich by nature, it must be made so by art; for if the roots of tender plants have not a soil they affect, or sufficient room to strike in, there will be little hope of their furnishing themselves with that ample stock of fibres which is necessary to a good plant, and with which it is the principal use of the nursery to supply them. The situation of the nursery is determined by the soil, or by local conveniences: the nearer it is, the more attendance will probably be given it; but the nearer it lies to the scene of planting, the less carriage will be requisite. In pruning seedlings, layers, and suckers, for the nursery, the roots should not be left too long, but trimmed off pretty close, to form a snug globular root. By this means the new fibres will be formed immediately round the main root, and may of course easily be removed with it, without disturbing the earth interwoven among them. The tops should, in most cases, be trimmed close up to the leader; or, if awkward or defective, be cut off a little above the root. Various methods are practised for putting in seedlings; by the dibble, by the scoop, by a single chop with the spade, by two chops one across the other, by square holes made by four chops of the spade, bringing up the mould with the last, or by bedding, a method chiefly made use of for quicksets. The chief art in putting them in, lies in not cramping the fibres of the roots, but letting them lie free and easy in the mould: the particular mode or instrument to be made use of depends much upon the size of the plants to be put in. This also determines in a great measure the proper distance between the rows, and between plant and plant. The proposed method of cleaning is also a guide to the distance. The natural tendency of the plant itself must also be considered. From six to twenty-four inches in the rows, with intervals from one to four feet wide, will comprehend the whole variation of distances, Pruning is necessary, to prevent the plants from crowding to each other, and to give them stem. Shrubs which do not require a stem should be planted in a quincunx, that they may spread every way; but forest and other trees require some length of stem, and in giving them this, the leading shoot is more particularly to be attended to. If the heads be double, one of the shoots must be taken close off; if it be maimed or defective, it may be well to cut the plant down to the ground, and train a fresh shoot; or if the head be taken off smooth, immediately above a strong side-shoot, this will sometimes outgrow the crookedness, and in a few years become a straight plant. The time of the plants remaining in the nursery is determined by a

variety of circumstances; and a seasonable thinning often becomes necessary. The general rule for this is to thin as soon as the tops or roots interfere. In taking up trees or shrubs for the purpose of planting them out where they are to stand, every root and fibre ought as much as possible to be preserved; and therefore no violence should be used in this operation. The best way is to dig a trench close by the side of the plant, and having undermined the roots, to let it fall of itself, or with a very little assistance, into the trench: if any roots still have hold, cut them off with a sharp instrument, so as to jar the main root as little as possible. If the root was properly pruned before planting, it will now turn out a globular bundle of earth and fibres. When the nursery lies at a distance from the plantations, much depends upon packing the plants judiciously. Valuable plants are sent in pots or baskets; straw however is used in general, and will sufficiently protect them from frost and drought, especially if, for the latter purpose, the straw be occasionally moistened with water. Moss is the most effectual article for keeping the roots moist and supple when removed to a great distance.

Having given the opinions of the above able horticulturists, we shall proceed to detail the remarks of other eminent authors, upon this important subject: Mr. Boutcher states, that it is an almost universally received opinion, that trees ought to be raised in the nursery on a poorer soil than that to which they are afterwards to be transported for good; and it has been directed by many of the most respectable authors; he himself adhered to it in early life, and it is so seemingly consistent with nature, that he is not surprised that it has been generally followed by young planters; at the same time that he cannot account for those who have had long practice, and much experience, not exposing the fallacies of that system. He adds, that he has given some examples, from frequently repeated experiments, of the ill effects he has felt by planting young and tender seedlings on the poorest soils, and the greater success attending those that are well grown on the same or in similar situations. The consequences of raising plants on poor hungry land are no less fatal than planting seedlings in such soils, and should be avoided as much as possible. In the culture of many trees, it is necessary to promote their vigorous growth at first, that they may afterwards become stately and handsome, which can only be effected by their being early nursed in a generous soil; if they are but barely supported from infancy on meagre ground, they will never afterwards become strong, though removed to that which is rich in feeding. He has sown the seeds of forest trees on the poorest ground, planted seedlings and strong well-nursed trees from five to ten feet high, on the same ground and at the same time; where the old well cultivated plants have frequently made good trees, when the seedlings have perished, and, from the sterility and coldness of the soil, the seeds have not so much as vegetated. In short, the roots of seedlings are not so well fitted as larger plants, to draw sufficient nourishment from crude, rank, and uncultivated soils; and as he has truly found what he has here said in many instances to be the case, it compels him to believe that the general practice of planting seedlings in poor, and large trees in good land, should be quite reversed. It has also been stated by others, that almost all writers on agriculture advise the farmer to be very careful to make choice of such plants only as have been raised in a nursery of poor soil, and always to reject such as have been reared in a richer soil than that in which he has to plant them; because a plant which has been reared in a barren soil, has been inured from its infancy to live hardily, and will advance with a great degree of luxuriance, if it be planted in one that is better; whereas a plant that has been nursed in a fertile soil, and has been rushed up to a great size, like an animal that has been pampered with high feeding, and swelled up with fat, will languish and pine away, if transplanted to a more indifferent soil. But it would be no difficult matter to shew the fallacy of this mode of reasoning, and to point out many errors which have crept into almost all sciences, from pursuing such fanciful analogies between objects so dissimilar as those mentioned in this example. But as this would be a digression, it may just be noticed, that it could seldom be attended with worse consequences than in the present case, as it leads to a conclusion directly the reverse of what is warranted by experience; for it has been found from reiterated experiments, that a strong and vigorous plant, that has grown up quickly, and arrived at a considerable magnitude in a very short time, never fails to grow better after transplanting, than another of the same size that is older and more stinted in its growth, whether the soil in which they are planted be rich or poor: so that instead of recommending a poor hungry soil for a nursery, it would perhaps be the best in all cases to set apart for this purpose the richest and most fertile spot that could be found; and in the choice of plants, always to prefer the youngest and most healthy, to such as are older, if of an equal size: this is given as the result of much experience in this business. And this practical planter suggests, that so much has been said concerning the question, whether a nursery should be on a soil and in a situation corresponding to those on which the trees are ultimately to be placed, that he should deem it unpardonable to dismiss the subject in silence. He briefly delivers his own opinion, so that the reader may apply or reject what agrees with, or is opposed to his. Mr. Boutcher's first remark is, that experience had taught him that it is only for an extensive scale of planting, that the nursery can be had recourse to; in other cases, it is no saving for a gentleman to rear a nursery. He confines himself to the nursing of seedlings only on the same principle; and from indisputable proofs, demonstrated both by himself and others, who have had much experience, and made impartial trials how far it might be to a gentleman's advantage to rear his own nursery from seed; and they have all found it unprofitable, and attended with considerable perplexity; which is not at all surprising, when we reflect on the multiplicity of business at that season most critical for ensuring success in this branch. If the soil and situation whereon the trees are ultimately to remain be good, or nearly resemble that which we are about to describe; then, if all other circumstances concur, he conceives the trees ought to be nursed on the spot; but for no other reason, than that it is less expensive to carry to a distance seedling, than transplanted trees. But if the soil whereon the trees are to be planted be bad, or essentially different from that we are about to describe, and if the situation be bleak, and exposed to violent winds, then he should conceive the attempt to rear nursery plants, clean, healthy, and well-rooted, opposed to common sense. After stating that great care and attention are necessary in rearing young plants; and that some are raised with more difficulty than others; it is asked, Are the Ash, the Beech, the Birch, the Elm, the Larch, And the Oak, reared in infancy with equal ease? Do they not, if properly treated, all equally flourish afterwards, on the mountain and in the vale, where soil is hardly found, and where it is found in abundance? Do we sow seed in sand, gravel, clay, the crevice of a rock, on the bleak top of a mountain, or in a fertile vale with equal expectation of seeing it rise a good plant?——*Sol.* That which Mr. Nichol supposes to be best suited for this purpose, is a loam of a middling texture, rather

inclining to sand, neither rich nor poor, from eighteen to twenty-four inches in depth, lying on a free, porous substratum, as this will be found more generally congenial to the nature of the different forest trees than any other soil. But there is no general rule without exception: if there be a diversity of soils, and if they do not too nearly approach the extremes of meagre sterility and excessive fertility, so much the better; since all the kinds do not exactly thrive in the same soil, and an opportunity would thereby be afforded of placing each in that congenial to its nature. The site should be neither high nor low, sheltered nor exposed, in any extreme, for the same reason, which is, that it may the more generally answer all purposes. For a nursery of this description, nothing can be more eligible than the spot which may occasionally be occupied as a kitchen-garden. The pulverization and mellowness afforded by the previous growth of various culinary crops, bring the land into the most suitable state for the raising of young trees, and at the same time clear it the most effectually from vermin, such as the grub and other insects. In all cases it will be advisable to trench the ground to its full depth, in preparing it for a nursery; and if necessary, to give it a dressing with lime, marl, dung, &c. in compost. Other manure should never be applied to nursery ground at the time of cropping with timber-trees. But at the time of cropping with esculents, manure, either simple or in a compost, may be applied, as convenience, or the nature of the crop in question, shall determine. But that the trees should immediately follow a manured culinary crop, is the best of all methods; as in that case no manure would be required for the timber crop. He has known an instance where a field was taken in for a nursery, from an old pasture of rough sward, and in which myriads of the grub-worm, slug, &c. had found an asylum. It was conceived that by subtrenching, or deeply digging it, the land might be effectually cleaned; and accordingly the field was planted with nursery plants, without any preparatory crop of grain, &c. But the result was, that most of the Firs, the Larches, the Elms, the Beeches, &c. became a prey to the vermin in the ensuing season; and their stems were found peeled entirely round, about an inch under the surface. For this reason it becomes a matter of caution, that a like misfortune be avoided, to take a crop or crops of grain, potatoes, turnips, &c. in order thoroughly to cleanse the soil of those noxious vermin, before venturing in it the more valuable crop of the nursery. But, in respect to the proper rotation, much must be left to the judgment of the operator and existing circumstances. The following example is given, on the suspicion that it may be applied, or partly rejected, according to the exigency of the case: 1st. Vegetables, with manure; winter fallow. 2nd. Evergreen and resinous trees, without manure. 3rd. Subtrenched; deciduous trees, resinous trees, without manure. 4th. Potatoes or turnips, with manure. 5th. Evergreen and resinous trees, as before, &c. However, for the extensive plantations of the Duke of Portland in Nottinghamshire, where the soil is of a light sandy kind, some well-situated valley is usually chosen, as near the centre of the intended plantations as possible, for the purpose of a nursery. If this valley be surrounded with hills on all sides but the south, so much the better. A piece of ground, consisting of as many acres as is convenient for the purpose, is fenced about in such a manner as to keep out all noxious animals. At each end of the nursery, large boarded gates are fixed, and also a road made down the middle, wide enough to admit carriages to go through, which is found to be very convenient for removing young trees from thence to the plantations. After the fence is completed, the ground on each side of the road is trenched about twenty inches deep, which may be done for about £3. 10s. or £4. an acre, and should be performed in the spring when the planting season is over. If after the trenching two or three chaldrons of lime be laid on an acre, the land will produce an excellent crop either of cabbages or turnips, which being eaten off by sheep in the autumn, will make the land in fine order for all sorts of tree seeds; but as the Oak is the sort of tree generally cultivated, this is the method pursued in raising and managing that most valuable species.—*Culture.* As soon as the acorns fall, after being provided with a good quantity, sow them in the following manner; Draw drills with a hoe in the same manner as is practised for pease, and sow the acorns therein so thick as nearly to touch each other, leaving the space of one foot between row and row, and between every fifth row the space of two feet for the alleys. While the acorns are in the ground, great care must be taken to keep them free from vermin, which would very often make great havoc among the beds, if not timely prevented; and this caution applies to most other sorts of tree seeds. As soon as the seedlings appear, the beds should be weeded, which should be often repeated, until they want thinning: and as the plants frequently grow more in one wet season where the soil is tolerably good, than in two dry ones where the soil is poor, the time for doing this is best ascertained by observing when the tops of the rows meet; which is done, when that is the case, by taking away one row on each side the middlemost, which leaves the remaining three rows the same distance apart as the breadth of the alleys. In taking up these rows, the workman ought to be careful neither to injure the plants removed, nor those left on each side. The rest of the young Oaks being now left in rows at two feet apart, let them again stand till the tops meet; then take up every other row, and leave the rest in rows four feet asunder, till they arrive to the height of about five feet; which is full as large a size as can be wished to be planted. In taking up the two last sizes, the method is to dig a trench at the end of each row full two feet deep; then undermine the plants, and let them fall into the trench with their roots entire: the same mode is necessary with the other sorts of trees, very much of their future success depending on the point of their being well taken up. But Mr. Nicol does not nurse trees in general more than two seasons, as they are either one or two years in the seminary, according to their kinds, before they come under view; and as the after treatment for many kinds is the same, for the sake of brevity he classes such as with propriety may be classed together, and whose culture in the nursery is similar, particularly those only that are of the greatest importance, and whose treatment is materially different. He advises that the Alder and the Birch should remain two years in the seminary, and then be removed into nursery rows. The richest and choicest ground in the nursery, provided it be of such soil and in such situation as is described above, should be allotted for them. They are to be planted in lines twelve inches asunder, and about four inches in line. The roots of the Alders may be trimmed a little with the knife. The Birches must not be touched. And he adds, that whether plants should be put in with the spade or setting-stick, is a question frequently agitated. He is of opinion, it is a matter of little importance to plants of this age which method is practised, provided either be well performed. The size of the roots should determine; for it would certainly be improper to force a large root into a small hole, to the evident detriment of the plant, by its roots and fibres being bundled together in a mass, without the intervention of mould. It is equally improper to force

a plant into a slit or gash, the sides of which, by the operation of making it, are hardened, and rendered impenetrable, in a great measure, by the tender fibrils, for a time, until rain and the influence of the weather soften them. He therefore, for the better performance of both methods, would advise: 1st, for dibbling; that the ground be well broke in the operation of digging or trenching; that whatever is dug be also planted the same day; that it neither be dug nor planted in too wet nor too dry a state; that the hole be made large and loose by a twitch of the hand; that the plant be just sufficiently fastened to keep it in proper position; and that, at the end of each day's work, the whole be levelled, and the earth closed to the stems with a short-headed rake: 2nd, for laying in with the spade; that (instead of digging over the ground first, and then planting in a slit or gash, whereby the sides of the slit are hardened, and the roots crowded in,) the digging and planting be both carried on together; that is, turn one furrow farther than where the row is to be placed, cut perpendicularly by the line; place in the plants; turn another furrow to their roots; turn a second, or if necessary a third furrow; cut and place as before, &c.; treading none, but smoothing all with the rake. Farther, the Ash, and Mountain Sorb, should also remain two years in the seminary. The poorest soil in the nursery should be their portion, reserving better for the kinds to follow. They should also be planted in lines twelve inches asunder, and four in line; the roots of both being moderately trimmed with the knife. The Beech and the Oak are to remain two years in the seminary, and should be planted in good soil, in lines fifteen inches apart, and five or six in line. Their roots ought on no account to be trimmed at this time; otherwise not one half of the plants will strike. They should remain for two seasons in this situation; at the end of the first, let their tap-roots be cut at the depth of six inches below the surface, a person cutting on each side the row with a spade sharpened on purpose, so as to effectually cut the tap-root of each plant, with as little injury to the upper part as possible, then pointing up the intervals of the rows, levelling all the stems of the plants. It is supposed, that at the end of the second season the plants will have made fibry roots, and be fit for removal to almost any situation. But if for any particular purpose it be necessary to nurse them longer, in that case they should be transplanted next season into fresh nursery rows; allowing them a little more room, and shortening all roots which have a tendency downwards. The common Chesnut, and also the Horse-chesnut, should also stand two years in the seminary, and any part of the nursery will suit them. They should then be planted in lines fifteen inches apart, and four or five in line. Their roots may be gently pruned. They should stand two or three seasons, according to their progress, in this situation. Being chiefly ornamental plants, and designed for the less untoward situations, they are frequently required of larger size. If so, at the end of the second season they should be moved, and planted into rows eighteen or twenty inches apart, and eight or nine inches in line; previously shortening all the roots that tend downwards, and tapping, as advised above for Beech and Oaks. But the Elm, the Hornbeam, and the Sycamore, are sometimes removed from the seminary at one, and sometimes at two years old; he prefers the latter, planting them in lines twelve inches apart, and four in line, and pruning the roots if required. At the end of the second season, they will be fit for removal to any situation where soil to the depth of four inches is found; but if intended for more barren sites, they should be removed at the end of the first year. In respect to the Larch, it should never remain more than one season in the seminary. Mr. Nicol is convinced of this, from having made a variety of experiments for ascertaining the quickest and most advantageous methods of rearing this useful tree. The result of experiment has proved to his entire satisfaction, that a healthy seedling of one year, nursed in moderately good soil, having a sufficiency of room, and kept properly clean of weeds, will in any soil or situation wherein it may afterwards be placed, outgrow another of any age within the seventh year after transplanting. He has planted many of this description, and within that period has measured them fifteen feet in height; while those on the same spot, planted the same day, and which were some two, some three years nursed, did not measure above twelve feet, nor were they so straight and beautifully formed. With regard to the Scotch Fir, and the Weymouth Pine, the former, unless for the purpose of decoration, or where it is wanted for variety, is never nursed, but taken from the seminary at two years old, and then planted out for good. Mr. Nicol approves of this practice, provided the plants stand thin in the seminary; but otherwise they should be nursed one year in rows a foot asunder, and an inch in line. If they are required of a larger size, they should be removed from this into other nursery lines, at twelve or fifteen inches apart, and four or five in line, according to the time they are to remain there, which however should not be longer than two years for any purpose whatever. The Weymouth Pine should also stand two years in the seminary, and then be nursed two or three years in rows, according to the purpose intended, or the quality and depth of soil wherein it is to be afterwards planted. In either case, fifteen inches between the lines will be sufficient; and if they are to remain two years, four in line; but if three, five or six. The tap-roots of the seedlings of either may be shortened a little; but at the second, or any subsequent removal, their roots must not be touched. But the common or Norway Spruce should be removed from the seminary at two years old, and nursed in lines twelve inches apart, and three in line, for two seasons; at the end of which, remove them into other lines fifteen inches apart, and four or five in line; there to remain one, or at most two years, in proportion to their progress, or the soil they are planted in. If they are intended for very barren sites, plants nursed for two seasons only are preferred. The roots of this plant should not be pruned at any time, if it can be avoided; nor indeed should any of the resinous tribes, except a small piece of the tap-root of seedling infants. The American Spruce and the Silver Fir are also to be taken from the seminary at the end of the second year, and planted in lines twelve inches apart, and four in line; nursing them there for two seasons, and then removing them into other lines, eighteen inches apart, and six in line, there to remain for one or two seasons more, according to circumstances. Longer they should not be nursed. If they be intended for bleak exposures and barren soil, they should be removed thereto at the end of the two first seasons of nursing, if possible. In regard to the Quick or White Thorn, which is a most useful plant, it may remain either one or two seasons in the seminary, according to the progress it may have made; then planting in lines twelve inches apart, and two in line; at the end of one season, removing the plants into other lines, twelve inches apart, and four in line. The roots may be gently pruned. It is observed, that the reason of removing them at the end of the first year, is to encourage the progress of their fibry roots. At the end of the second, they will be fit for hedging in any situation whatever; nor will plants of any age or size outgrow them within the third year, if they

are properly weeded and kept clean after that period.—*Season of Planting.* For the deciduous kinds, from the middle of February to the middle of March is considered the most eligible season; and for the evergreens, from the middle of July to the middle of August; taking advantage of wet or cloudy weather, and frequently watering in hot dry weather, till the plants have struck root perfectly. The plants of all descriptions should be carefully kept clean from weeds in the summer months; and the interstices of all the rows, which stand over a year, be pointed in with a narrow spade, in any of the winter months, taking care not to injure the roots of the plants in the operation. With respect to pruning, the evergreens must not be touched, unless they put forth rival stems or leaders; in which case the weakest must be displaced. The Larch is to be treated in the same manner. All branches of the deciduous kinds, which seem to rival the stem in size, or take upon them the office of leaders, are to be cut clean off by the bole with a sharp knife. This is the general management which is necessary to be noticed here. See *Planting*.

Nut, Bladder. See *Staphylæa.*
Nut, Cashew. See *Anacardium.*
Nut, Cocoa. See *Cocos.*
Nut, Earth. See *Arachis.*
Nut, Malabar. See *Justicia Adhatoda.*
Nutmeg Tree. See *Myristica.*
Nut, Physic. See *Jatropha.*
Nut, Common Hazel. See *Corylus.*
Nut, Poison. See *Strychnos.*
Nux Vomica. See *Strychnos.*

Nyctanthes; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, one-leafed, tubular, truncate, quite entire, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindric, the length of the calix; border five-parted, spreading, with the lobes two-lobed. *Stamina:* filamenta two, in the middle of the tube, very short; antheræ oblong, the length of the tube. *Pistil:* germen superior, subovate; style filiform, the length of the tube; stigmas two, acute. *Pericarp:* capsule obovate, compressed, with an emarginated dagger-point, coriaceous, two-celled, bipartile; cells parallel, appressed, valveless. *Seeds:* solitary, obovate, convex on one side, flat on the other, fastened to the bottom of the cell. *Observe.* The corolla appears for the most part to be five-parted; but it is sometimes six or seven parted, and Linneus observed it to be four-parted. Essential Character. *Corolla:* salver-shaped, with truncated segments. *Capsule:* two-celled, margined. *Seeds:* solitary.——The plants of this genus may be cultivated in the same manner as the *Jasminum Sambac*, to which the reader is referred.——The species are,

1. Nyctanthes Arbor tristis; *Square-stalked Nyctanthes.* Stem four-cornered; leaves ovate-acuminate; pericarp membranaceous, compressed; branches four-cornered. Trunk from one to two feet diameter; branches square and knotty: leaves opposite, ovate, pointed, entire, rugged; flower-stalks axillary, opposite, solitary, terminated by three small bunches of flowers, of a white or yellowish colour, like those of Jasmin, and very fragrant at night.—Native of sandy deserts in the East Indies.

2. Nyctanthes Undulata; *Wave-leaved Nyctanthes.* Leaves ovate-acuminate, waved; branches round. This shrub attains to the height of a man. The young shoots are hairy; flowers white, three or five together; fruit superior, smooth, and black, like a small cherry, with a thin skin, and a soft, dark, red, sweetish pulp, containing a round hairy seed.—Native of the East Indies, where it is much cultivated on account of the sweetness of the flowers, which are worn by the females to ornament their hair.

3. Nyctanthes Hirsuta; *Hairy Nyctanthes.* Petioles and peduncles villose. This is a tall tree, with a thick trunk of a close white wood, covered with a dark purple, smooth, inodorous, insipid bark; leaves opposite, decussated, acuminate, soft, smooth, shining, dark green above, on round, rufous, lanuginous petioles; flowers on the more tender branches, on long, rufous, lanuginous peduncles, from the axils of the leaves three or four or more together, white, smelling very sweet, opening during the night, and fading at sunrise.—Native of the East Indies and China.

4. Nyctanthes Angustifolia; *Narrow-leaved Nyctanthes.* Leaves obtuse-lanceolate, and ovate. This is compared with the Jasminum Sambac by Rheede. It has a very fine smell, and flowers in June and July.—Native of Malabar.

5. Nyctanthes Elongata; *Long-leaved Nyctanthes.* Leaves cordate, lanceolate-ovate, elongated and smaller; branches round.—Native of the East Indies.

6. Nyctanthes Viminea. Branches round, elongated; leaves ovate-acuminate; peduncles axillary, one-flowered; terminating ones three-flowered. This shrub has weak, smooth, osier-like branches. The flowers are white, double, terminating, one or two together, three times as large as those of the Sambac, handsomer, but not so fragrant.—Native of China and Cochin-china.

7. Nyctanthes Pubescens. Branches round, hirsute; leaves cordate, pubescent on both sides; flowers in bundles at the ends of the branches.—Native of the East Indies.

Nymphæa; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of four, or five, or six, large leaves, coloured above, permanent. *Corolla:* petals numerous, often fifteen, placed on the sides of the germen, in more than one row; nectary globose, sessile, in the middle of the stigma. *Stamina:* filamenta numerous, often seventy, flat, curved, blunt, short; antheræ oblong, fastened to the margin of the filamenta. *Pistil:* germen ovate, large; style none; stigma orbiculate, flat, many-cleft, rayed, crenate at the edge, permanent. *Pericarp:* berry hard, ovate, fleshy, rude, narrowed at the neck, crowned at the top, many-celled, (cells from ten to fifteen,) full of pulp. *Seeds:* very many, roundish. *Observe.* The second species differs from the rest in having a five-leaved calix, with roundish leaflets, and the petals very small. The sixth species has the pericarp turbinate, truncate, with one seed in each cell, the cells opening by their proper holes along the disk. Essential Character. *Calix:* four, five, or six leaved. *Corolla:* many-petalled. *Berry:* many-celled, truncated.—These are herbaceous perennial plants, with long tuberous roots; leaves alternate, on a very long petiole, half-sheathing, below floating; peduncles long, naked like scapes, one-flowered; flowers large, emerging; germen and stigma approaching to the Poppy.——The species are,

1. Nymphæa Advena; *Three-coloured Water Lily.* Leaves cordate, quite entire; lobes divaricate; calix six-leaved, longer than the petals; petioles half round, commonly erected above the water. It flowers in July.—Native of North America.

2. Nymphæa Lutea; *Yellow Water Lily.* Leaves cordate-entire; lobes approximating; calix five-leaved, longer than the petals. The leaves are smooth, plane, except that they turn up a little at the edge to keep off the water, tough and pliant, ten or twelve inches in diameter, floating, ovate, or nearly orbicular, bright green above, paler underneath, with branched raised nerves or veins; petioles smooth, three-sided, their length depending on the depth of water. The case is the same with the peduncle, which always elevates

the flower above the water; but after it is impregnated, the seeds are ripened under water, and fall into the mud at bottom to produce new plants. The peduncles are round, succulent, and one-flowered; flowers an inch and half in diameter, having a vinous smell. Linneus informs us that swine are fond both of the leaves and root of this plant; but that horses, cattle, sheep, and goats, refuse it: he asserts, that crickets are driven out of houses by the smoke in burning it, and that both they and cockroaches are destroyed by the roots rubbed or bruised with milk. Ray observes, that the flowers smell like brandy; and Dr. Withering remarks, that an infusion of a pound of the fresh root in a gallon of water, taken in the dose of a pint night and morning, cured a leprous eruption of the arm. The Germans have a variety of names for this plant, such as *die Gelba Seeblume, Gelbe Seerose, Gelbe Plumpen, Gelbe Mummeln*, &c.; the Dutch call it, *Geele Plompen;* the Danes, *Aackandel, Soeblomster*, and *Haarrod;* the Swedes, *Nackblad;* the Smolanders, *Siollon;* the French, *le Nenuphar Jaune;* the Italians, *Nenufaro Giallo, Ninfea Gialla;* the Spaniards, *Nenuphar Amarilla, Escudete;* and the Portuguese, *Nymphea Amarella, Golfiaõ.*—It is a native of most parts of Europe, in slow rivers, pools, and ditches; flowering in July and August. Kalm observed the same species in Canada, with a flower hardly so large as the *Caltha palustris.*—The best method of propagating this and the next species is, to procure some of their seed-vessels just as they are ripe and ready to open, and to throw them into canals or large ditches of standing water, where the seeds will sink to the bottom, and the following spring the plants will appear floating upon the surface of the water. When they are once fixed to the place, they will multiply exceedingly, so as to cover the whole surface of the water in a few years. They may also be cultivated in large troughs or cisterns, having earth at the bottom, and will flourish very well in them, annually producing a great quantity of flowers.

3. Nymphæa Alba; *White Water Lily.* Leaves cordate, quite entire; lobe imbricate, rounded: calix four-leaved; root tuberous, frequently the size of the human arm, creeping far and wide, and deep in the mud. The whole plant is larger in all its parts than the preceding. Flowers large, being sometimes six inches in diameter, and double; petals white, from sixteen to twenty or twenty-four in number, in two or three rows, wider than the leaves of the calix, and more ovate. According to Linneus, the flower raises itself out of the water, and expands about seven o'clock in the morning, and closes again, reposing upon the surface about four in the evening. The roots have an astringent bitter taste; they are used in Ireland, in the Highlands of Scotland, in the islands of Jura, &c. to dye a dark brown or chesnut colour. Swine are said to eat it; goats not to be fond of it; cows and horses to refuse it.—This plant is a native of most parts of Europe, in slow streams, pools, and ditches, flowering in July and August. Both it and the preceding are called *Watercan* or *Candock*, and *Watersocks*, in some counties of England. The Germans call it *die Weisse Seeblume*, or *Serose*, &c.; the Dutch, *Witte Plumpen*, and *Wateroos*, &c.; the Danes, *Aekande, Soeblomster*, &c.; the Swedes, *Sjoblad;* the French, *le Nenuphar Blanc, Lis d'Etang;* the Italians *Ninfea Bianca;* the Spaniards *Ninfea Blanca;* the Portuguese, *Nymphea Branca;* and the Russians, *Wodanoi Lelei*, &c. See the preceding species.

4. Nymphæa Odorata; *Sweet-smelling Water Lily.* Leaves cordate, entire, emarginate; lobes divaricating, with an obtuse point; calix four-leaved. It flowers in July. This is in all its parts smaller than the third species. The flowers have a sweet hawthorn-like scent.—Native of North America and the eastern parts of Siberia.

5. Nymphæa Lotus; *Egyptian Water Lily.* Leaves cordate, toothed. This resembles our common white species very much in the form of the flower and leaves, but the latter are toothed about the edge.—It is a native of the hot parts of the East Indies, Africa, and America. It is very common in ponds, lakes, and rivers, in Jamaica; and grows in vast quantities in the plains of Lower Egypt, near Cairo, while those parts are under water. It flowers there about the middle of September, and ripens seed towards the end of October. The Arabians call it *Nuphar.* The ancient Egyptians made a bread of the seed of this plant dried and ground.

6. Nymphæa Nalumbo; *Peltated Water Lily.* Leaves peltate, entire all round; root horizontal, long, creeping, consisting of joints linked together, ovate-oblong, white, fleshy, esculent, tubular within; petioles erect, very straight, round, hispid, or muricated, thicker below, attenuated above; peduncle the thickness of a finger below, attenuated above, spongy, muricated, one-flowered; flower as large as the palm of the hand, or larger, purple. This plant is the connecting link between the monocotyledonous and dicotyledonous plants; for by the structure of the seed it appears to belong to the latter, but in reality it ranks with the former, for it constantly puts forth one leaf only in germination, and does not produce a second until the first is entirely unfolded above water: this, Gærtner found to be the case with more than fifty nuts which he received from Lerche.—This plant is a native of both the East and West Indies, China, Cochinchina, Japan, Persia, and some parts of the Russian empire. Brown says it is pretty common in the lagoons beyond the ferry in Jamaica, but not in the deeper waters. Thunberg informs us that it is considered as a sacred plant in Japan, and pleasing to their deities, and that the images of their idols were often seen sitting on its large leaves. The long stalks are eaten among other pot-herbs. It differs from the Egyptian Lotus in having entire thin leaves, with the petiole and peduncle rugged. Loureiro relates, that it abounds in muddy marshes, and is cultivated in large handsome pots in the gardens and houses of the mandarins; that there is a variety with the flower of a pure white, and another with a very beautiful luxuriant flower, having about one hundred large petals, white or rose-coloured. Both root and seeds are esculent, sapid, and wholesome. They are accounted cooling and strengthening, and to be of service in extreme thirst, diarrhœa, tenesmus, vomiting, and too great internal heat. In China it is called *Llen-wha:* and the seeds and slices of the hairy root, with the kernels of apricots and walnuts, and alternate layers of ice, were frequently presented to the British ambassador and his suite, at breakfasts given by some of the principal mandarins. The Chinese have always held this plant in such high value, that at length they regarded it as sacred. That character, however, has not limited it to merely ornamental purposes: for the roots are not only served up in summer with ice, but they are also laid up in salt and vinegar for the winter. The seeds are somewhat of the form and size of an acorn, and of a taste more delicate than that of almonds. The ponds are generally covered with it, and exhibit a very beautiful appearance when it is in flower; and the flowers are no less fragrant than handsome. Sir George Staunton remarks, that the leaf, besides its common uses, has from its structure, growing entirely round the stalk, the advantage of defending the flower and fruit, growing from its centre, from any contact with the water, which might injure them. He also observes, that the stem never fails to ascend in the water, from what-

ever depth, unless in case of a sudden inundation, until it attains the surface, where its leaf expands, rests, and swims upon it, and sometimes rises above it. Though it is so difficult to rear this plant in England, it bears the rigorous cold of a Pekin winter.——The Tree Lotus must not be confounded with the Nymphæa: Mungo Park, in his extensive peregrinations in Africa, discovered this to abound in all the countries he traversed, but flourishing most in a sandy soil. It is rather a thorny shrub than a tree. The fruit is a small farinaceous berry, which, being pounded and dried in the sun, is made into excellent cakes, resembling, in colour and flavour, the sweetest gingerbread. Theophrastus describes the Lotus tree as sometimes less than a Pear-tree. The classic poets represent it as an aquatic tree.

7. Nymphæa Rubra; *Red Water Lily.* Leaves somewhat peltate, sharply toothed, downy, with permanent reticulated veins beneath, and prominent ribs above, their lobes divaricated and acute.—Native of the East Indies.

8. Nymphæa Versicolor; *Changeable Water Lily.* Leaves somewhat peltate, bluntly toothed, blistered on both sides, their lobes approximated and rounded; petals pale blush-coloured. The root propagates itself by tubers, like the potato, each tube flowering but once.—Native of the East Indies.

9. Nymphæa Cœrulea; *Blue Water Lily.* Leaves somewhat peltate, very slightly and bluntly toothed, smooth and even on both sides; rays of the stigma very numerous, inflexed. Its large and beautiful blue flowers are very fragrant, their stamens and pistils yellow. It blooms from May to September; and may be very easily kept in a tub, without being plunged into the bark bed.—It is a native of Egypt.

Nyssa; a genus of the class Polygamia, order Dicœcia.—Generic Character. *Male. Calix:* perianth five-parted, spreading, with a plain bottom. *Corolla:* none. *Stamina:* filamenta ten, awl-shaped, shorter than the calix; antheræ twin, the length of the filamenta. *Hermaphrodite. Calix:* perianth as in the male; sitting on the germen. *Corolla:* none. *Stamina:* filamenta five, awl-shaped, erect; antheræ simple. *Pistil:* germen ovate, inferior; style awl-shaped, curved inwards, longer than the stamina; stigma acute. *Pericarp:* drupe. *Seed:* nut oval, acute, scored with longitudinal grooves, angular, irregular. Essential Character. *Calix:* five-parted. *Corolla:* none. *Male. Stamina:* ten. *Hermaphrodite. Stamina:* five. *Pistil:* one. *Drupe:* inferior.—These plants may be propagated by seeds procured from the places where they grow naturally, and put into the ground as soon as they arrive, for they always lie a year before they come up. Sow them in pots filled with a light loamy earth, placing them where they may have only the morning sun; during the first summer the pots must be kept clean from weeds, and in dry weather duly watered. In autumn, plunge the pots into the ground; and if the winter should prove severe, cover them with old tan, pease-haulm, or other light covering; the following spring, plunge them into a moderate hot-bed, hooped over and covered with mats, observing constantly to keep the earth moist. This will bring up the plants by the beginning of May; when they should be gradually hardened, to bear the open air. During the following summer, plunge the pots again into an east border, and duly water them in dry weather. In autumn remove them into a frame, where they may be screened from frost, but in mild weather exposed to the air. The spring following, before the plants begin to shoot, part them carefully, and plant each in a small pot filled with loamy earth, and if they are plunged into a moderate hot-bed, it will accelerate their putting forth new roots; then they may be plunged into an east border, and in winter sheltered again under a frame. In the third spring, such plants as have made the greatest progress, may be planted in a loamy soil, in a sheltered situation, where they will endure the cold of this climate; but unless the ground be moist, they make very little progress. They may also be propagated by layers and cuttings.——The species are,

1. Nyssa Integrifolia; *Mountain Tupelo,* or *Sour Gum.* Leaves quite entire; nuts roundish, striated. This tree rises with a strong upright trunk to the height of thirty or forty feet, and sometimes nearly two feet in diameter; sending off many horizontal, and often depending, branches. The timber is close-grained and curled, so as not to be split or parted; and therefore much used for hubs of wheels of carriages.—Native of Pennsylvania.

2. Nyssa Denticulata; *Water Tupelo.* Leaves remotely-toothed; nuts oblong, grooved, somewhat wrinkled. This tree rises with a strong upright trunk to the height of eighty or a hundred feet, dividing into many branches towards the top. The berries are near the size and shape of small olives, and preserved in the same manner by the French inhabitants upon the Mississippi, where it greatly abounds, and is called the Olive-tree. The timber is white and soft when unseasoned, but light and compact when dry, which renders it very proper for making trays, bowls, &c.—It grows naturally in wet swamps, or near large rivers, in Carolina and Florida. There is a species called the Lime-tree, which is described as singularly beautiful, growing naturally in water, in the southern states of America, and rising to the height of about thirty feet. Mr. Bartram informs us, that he saw large tall trees of this sort on the banks of the Alatamaha river, growing in the water near the shore. He calls it Nyssa Coccinea; and observes, that there is no tree which exhibits a more desirable appearance than this in the autumn, when the fruit is ripe, and the tree divested of its leaves, for then they look as red as scarlet, with their fruit of the same colour. The most northern settlement of this tree yet known is on great Ogeechee, where it is called *Ogeechee Lime,* from the acid fruit being about the size of limes, and being sometimes used in their stead. See the next species.

3. Nyssa Candicans; *Ogeechee Lime Tree.* Leaves very slightly petiolated, oblong, entire, cuneated at the base, hoary underneath; female peduncles uniflorous; drupes oblong. This appears to be the Nyssa Coccinea of Mr. Bartram above mentioned, the only difference being, that Pursh describes the fruit as large and orange-coloured, not scarlet-coloured. He states it to be full of an acid juice similar to a lime; and that it is found on the banks of rivers in Carolina, and particularly on the river Ogeechee.

4. Nyssa Villosa. Leaves oblong, very entire, acute on both sides; female peduncles subtriflorous; nuts short-obovate, and obtusely striated.—Found in all the woods from New England to Carolina. The flowers are small, and of a greenish hue; and the berries black, and of the size of a pea. The natives call it *Sour-gum.* See the first species.

5. Nyssa Tomentosa. Leaves petiolate, oblong, acuminate, remotely serrate, tomentose underneath; female peduncles uniflorous; drupes oblong. Fruit the size of the preceding species, of a dark blue colour.—It grows on the banks of the river St. Mary, and also in Florida.

OAK. See *Quercus.*

Oak of Cappadocia. See *Chenopodium Ambrosioides.*

Oak of Jerusalem. See *Chenopodium Anthelminticum.*

Oat. See *Avena Sativa.*

Oat Grass. See *Avena.*

Obolaria; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* none, except two bractes. *Corolla:* one-petalled, unequal; tube bell-shaped, ventricose, pervious; border four-cleft, spreading a little; segments shorter than the tube, bifid, a little unequally laciniated. *Stamina:* filamenta four, awl-shaped, from the slits of the corolla, the nearest a little longer; antheræ small. *Pistil:* germen ovate, compressed; style subcylindric, the length of the stamina; stigma bifid, thickish, permanent. *Pericarp:* capsule subovate, compressed, ventricose, one-celled, two-valved, with the partition contrary. *Seeds:* numerous, small like meal. Essential Character. *Calix:* two-leaved, or none, except two bractes. *Corolla:* four-cleft, bell-shaped. *Stamina:* from the slits of the corolla. *Capsule:* one-celled, two-valved, many-seeded.——The only known species is,

1. Obolaria Virginica. Stem simple; leaves opposite, the upper ones purple on the outside; flowers in terminating spikes, clustered at the top, pale red. It has the habit of Orobanche, and is allied to that genus.—Native of Virginia and Pennsylvania.

Ochna; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, inferior, coriaceous, permanent, five-parted; parts ovate, blunt, spreading, (rather five-leaved.) *Corolla:* petals five to twelve, caducous. *Stamina:* filamenta many, short; antheræ roundish. *Pistil:* germen ovate, angular, five-cleft; style angular, erect, permanent; stigma simple. *Pericarp:* none. *Seeds:* nuts five, ovate, erect, compressed a little on the outside, somewhat convex, slightly excavated within, blunt, with a thin shell; receptacle very large, fleshy, depressed, five-cornered; corners protuberant, rounded, keeled at top, to each of which is fastened a nut, with a triangular rounded scar; ribs five, between the corners of the receptacle, running down from the vertex to the base, and raised. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Berries:* one-seeded, fastened to a large roundish receptacle.——The species are,

1. Ochna Squarrosa. Racemes lateral. This is a small tree. Leaves alternate, oblong, acute, finely serrate, smooth, on short petioles, the youngest remarkably coloured with purple, four or five inches long, and two broad; flowers large, yellow, inodorous. This is the Yerrajuvie of the Telingas, which the Cingalese call Bokaerae.—Native of the East Indies and Africa. In the Circar mountains, it flowers about the beginnnig of the hot season, about which time they produce their leaves, which they cast in the cold season.

2. Ochna Jabotapita. Racemes terminating. This is a middle-sized tree, with a grey irregular bark, and a soft pliant wood. Leaves alternately opposite, pale green: flowers abundant, on certain branchlets, yellow and very sweet.—Native of South America.

3. Ochna Parvifolia. Peduncles one-flowered. This is a shrub resembling the first species, except in the size of the leaves and inflorescence.—Native of Arabia Felix.

Ochroma; a genus of the class Monadelphia, order Pentandria.—Generic Character. *Calix:* perianth double; outer three-leaved; leaflets lanceolate, caducous; inner one-leafed, funnel-form, five-cleft. *Corolla:* petals five, wedge-form, coriaceous. *Stamina:* filamentum one, cylindric; antheræ five, large, linear, connate, creeping up and down. *Pistil:* germen superior, oblong; style filiform, covered with the cylinder of the stamina; stigmas five, awl-shaped, wide, contorted. *Pericarp:* capsule coriaceous, subcylindric, five-grooved, commonly ten-cornered, five-celled, five-valved; valves woolly within, rolled back at the edge; partitions kidney-form. *Seed:* very many, oblong. Essential Character. *Calix:* double; outer three-leaved. *Antheræ:* connate, irregularly furrowed. *Capsule:* five-celled, many-seeded.——The only known species is,

1. Ochroma Lagopus; *Down Tree.* This is a very large tree, with divaricating branches; wood white, tender, and so light that it is used instead of cork to nets. Bark thick, fibrous, ash-coloured, varied with white spots, and netted with rufescent wrinkles; leaves above a foot long, with rufescent hairs; stalks as long again as the leaves, round, rusty-coloured; flowers erect, three or four inches long, pale red or yellowish, succulent and fleshy; seeds inclosed in a fine rusty down.—Native of the Antilles, and of America.

Ochroxylum; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth five-cleft, very small, permanent; segments ovate, acute, spreading a little. *Corolla:* petals five, ovate, reflex, bluntish, excavated below the tip, thickish, with a thinner margin; nectary an angular gland, subtrilobate, fleshy. *Stamina:* filamenta five, awl-shaped, flattish below, erect, a little longer than the corolla; antheræ roundish, incumbent. *Pistil:* germina three, placed on the nectary, outwardly gibbous; styles short; stigmas simple. *Pericarp:* capsules three, approximating, subglobular, inwardly compressed, placed on the lobes of the nectary, now become larger, and three-lobed, one-celled, opening on the inside? *Seeds:* two, convex on one side, compressed and angular on the other. Essential Character. *Calix:* five-cleft. *Petals:* five. *Nectary:* an annular three-lobed gland. *Capsula:* three, approximating, one-celled, two-seeded.—Nothing more is known of the above genera, than what Schreber has here stated.

Ocimum; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, two-lipped, very short, permanent; upper lip flat, orbiculate, wider, ascending; lower lip four-cleft, acute, converging. *Corolla:* one-petalled, ringent, resupine; tube very short, spreading; one lip turned upwards, wider, half four-cleft, blunt, equal; the other lip turned downwards, narrower, entire, serrate, longer. *Stamina:* filamenta four, declined; two a little longer, and two putting forth a reflex process at the base; antheræ half-mooned. *Pistil:* germen four-parted; style filiform, situation and length of the stamina; stigma bifid. *Pericarp:* none. *Calix:* closed, cherishing the seeds. *Seeds:* four, ovate. Essential Character. *Calix:* with the upper lip orbiculate, the lower four-cleft. *Corolla:* resupine, with one lip four-cleft, the other undivided. *Filamenta:* the two outer putting forth a reflex process at the base.—These plants being most of them annual, are propagated from seeds, sown in March upon a moderate hot-bed; and when they come up are to be transplanted into another moderate hot-bed, where they must be watered, and shaded until they have taken root; after which they must have plenty of air in mild weather, and must be watered frequently. In May they should be taken up with a ball of earth to their roots, and planted out in either pots or borders; shading and watering them as before. They may also be increased by cuttings, taken off any time in May, and planted in a moderate hot-bed, observing to shade and water them during ten days; and in three weeks' time they will be fit to remove. The seeds are usually brought from the south of France, or Italy, every spring, because some of the sorts seldom ripen their seeds in

this country in the open air. But seeds may be saved here, by placing the plants in an airy glass-case or stove, in the autumn; supplying them with water, and letting them have free air in mild weather.——The species are,

1. Ocimum Thyrsiflorum; *Thyrse-flowered Basil.* Flowers, panicle, fascicled; plant very much branched; stem erect, woody, a foot and half high, the whole subdivided into branches, channelled on both sides; corollas purple, pale on the outside, with the lower lip white.—Native of the East Indies.

2. Ocimum Monachorum; *Monk's Basil.* Stamina toothless, the alternate ones bearded at the base; stem erect, a foot high, roundish, somewhat hairy, with the branches commonly superaxillary; bractes heart-shaped, caducous; corollas smaller, white, with the lower tip purple.—This is an annual plant, but its native place is unknown.

3. Ocimum Gratissimum; *Shrubby Basil.* Stem suffruticose; leaves lanceolate, ovate; racemes round; flowers small; corollas white, with yellow antheræ.—Native of the East Indies.

4. Ocimum Album; *White Basil.* Leaves ovate, blunt; whorls of the racemes approximating, the mature ones four-cornered; corollas crenate; stem a foot high, greenish white, woody at the base.—Annual; native of the East Indies, and the island of Java.

5. Ocimum Verticillatum; *Whorled Basil.* Leaves ovate, blunt; raceme elongated, naked; flowers whorled, in fours, peduncled; stem a foot high, the whole even, shorter than the raceme, ascending.—Native of the Cape.

6. Ocimum Basilicum; *Common Sweet Basil.* Leaves ovate, smooth; calices ciliate; stem suffruticose, three feet high, erect, round, tomentose, with straight, ascending branches; flowers white. The leaves are peculiarly smooth, soft, and cool to the touch, and if not too much bruised, exhale a very delightful smell. They vary in colour, and are often spotted with purple.—Native of India and Persia. The Common Basil, which is used in medicine, and also for culinary purposes, especially in France, is a hairy plant, and has also a strong scent of cloves, too powerful for most persons, but very agreeable to some. The varieties of this species are, 1. Common Basil, with very dark green leaves, and violet-coloured flowers. 2. Curled-leaved Basil, with short spikes of flowers. 3. Narrow-leaved Basil, smelling like Fennel. 4. Middle Basil, with a scent of Citron. 5. Basil with studded leaves. 6. Basil with leaves of three colours. There are many other varieties, differing in the size, shape, odour, and colour of the leaves, in Europe, but particularly in the East, where it is not only used in cookery, but the herb is reckoned good in the head-ache, and wandering rheumatic pains; and the seeds are reckoned very efficacious against the poison of serpents, both taken inwardly and laid upon the wound. It is common enough in our gardens. An infusion of the green herb in boiling water, is good in all kinds of obstructions, particularly of the menses, which it gently, though effectually removes, and of consequence all the numerous train of disorders which originate from a suppression of that evacuation. The dried leaves are much used as an ingredient in cephalic and herb snuffs, and other sternutatory powders.—It may be treated as a hardy annual, but is best raised on a hot-bed.

7. Ocimum Minimum; *Bush Basil.* Leaves ovate, quite entire. This, as its name intimates, is a low bushy plant, seldom above six inches high. The flowers are in whorls towards the top of the branches, smaller than those of the preceding, and seldom succeeded by ripe seeds in England. The varieties are, 1. Smallest Basil, with black purple leaves. 2. With variable leaves. They are both annuals, flowering in July and August.—Native of the East Indies.

8. Ocimum Scabrum; *Rugged Basil.* Racemes simple, erect; leaves ovate, dotted underneath; stem upright, panicled, a foot high and more, the whole plant hairy and rugged.—Native of Japan.

9. Ocimum Capitellatum. Leaves ovate; flowers aggregate; petioles lateral; stem oleraceous, bluntly quadrangular, two-grooved, sparingly branched, a foot high; corolla white.—Native of China.

10. Ocimum Sanctum; *Purple-stalked Basil,* or *Sacred Herb.* Leaves somewhat oblong, blunt, serrate, waved; stem rough-haired; bractes cordate; corolla bright purple, scarcely larger than the calix. It is almost scentless; flowers in September; and is a native of the East Indies.

11. Ocimum Americanum; *American Basil.* Leaves sublanceolate, acuminate, subserrate; racemes round; stem subherbaceous. From a branched root springs an upright stalk, bluntly four-cornered, smooth, somewhat woody at bottom, perennial, and brownish, pale above, with a tinge of green; corolla flesh-coloured. The whole plant has a very grateful smell.—Native of Martinico.

12. Ocimum Campeachianum; *Campeachy Basil.* Leaves lanceolate, hoary underneath; petioles very long, villose; flowers peduncled; stalk upright, nearly two feet high, sending out two or four branches towards the top; colour of the flowers white.—The whole plant has a strong aromatic odour, and grows naturally in Campeachy.

13. Ocimum Tenuiflorum; *Slender-spiked Basil.* Leaves ovate-oblong, serrate; bractes cordate, reflex, concave; spikes filiform; stem from one to two feet high, roundish, purple, brachiate, having spreading hairs scattered over it. The flowers are so small as to be scarcely visible to the naked eye; they begin to open from the top of the spike.—Native of the province of Malabar, and other parts of the East Indies.

14. Ocimum Polystachyon; *Many-spiked Basil.* Corollas four-cleft; racemes leafless, nodding at top; stem erect, two feet high, brachiate, four-cornered, the corners sharp and rugged. This plant is assigned a place among the *Ocima*, although it has no teeth to the filamenta; because it cannot be a *Nepeta*, on account of the lower lip not being crenate; nor a *Mentha*, because the stamina are declined. It is perennial, flowering early in July and August.—Native of the East Indies.

15. Ocimum Serpyllifolium; *Wild Thyme-leaved Basil.* Leaves linear-lanceolate, quite entire; genitals very long. This is a very branching shrub; the branches divaricating, villose, and hoary.—Native of Egypt.

16. Ocimum Grandiflorum; *Great-flowered Basil.* Stem shrubby; leaves ovate, serrate; genitals very long. This is a fragrant undershrub, three feet in height.—It was found by Forskahl in Egypt, and was brought from Abyssinia by the celebrated traveller Bruce.

17. Ocimum Menthoides; *Mint-leaved Basil.* Leaves linear-lanceolate, serrate; stem a foot high, upright, brachiate, four-cornered; flowers each on their proper pedicels. It flowers in July.—Native of the island of Ceylon.

18. Ocimum Molle; *Heart-leaved Basil.* Leaves ovate, cordate, acute, serrate, wrinkled; sinuses closed; bractes roundish, wedge-form. This is an annual, pubescent, sweet-smelling plant; stem thick, bluntly quadrangular. It flowers in September and October.—Native of the East Indies.

19. Ocimum Scutellarioides. Corollas sickle-shaped; pedicels branched; stem pubescent. It differs so much from its congeners in the flowers as to be almost of a distinct

genus.—Native of the island of Tanna, and of the East Indies.

20. Ocimum Prostratum; *Prostrate Basil.* Stems prostrate; leaves elliptic, marked with lines; corolla very small, bluish.—Native of the East Indies.

21. Ocimum Acutum; *Sharp-leaved Basil.* Racemes filiform; leaves ovate, acuminate, serrate; bractes rough-haired; stem upright, smooth, even.—Native of the East Indies.

22. Ocimum Crispum; *Curl-leaved Basil.* Racemes terminating; leaves ovate, serrate, curled; calices hispid; stem upright, villose, branched.—It is a native of Japan, and is cultivated about Nagasaki, where it flowers in October and November. The Japanese esteem an infusion of this herb for colds and rheumatism, and colour the roots of black radishes and turnips, with various fruits, of a deep red, with a decoction of this plant.

23. Ocimum Rugosum; *Wrinkled Basil.* Racemes terminating; leaves ovate, acute, serrate, wrinkled underneath; stem grooved very finely, tomentose, two feet high and more.—Native of Japan.

24. Ocimum Inflexum. Panicle terminating, racemed; stem and branches flexuose. The powder of this plant is used by the Japanese to burn incense to their idols.—Native of Japan.

25. Ocimum Virgatum. Racemes whorled, rod-like; leaves oblong, serrate; stem deeply grooved, very finely tomentose, flexuose, erect, branched.—Native of Japan.

Œdera; a genus of the class Syngenesia, order Polygamia Segregata.—Generic Character. *Calix:* common many-flowered, many-leaved, longer than the flowers, squarrose; leaflets lanceolate, the lower ones larger, containing several partial calicles; partial many-leaved; leaflets chaffy, lanceolate, equal to the florets. *Corolla:* common radiate, with many partial flowers: partial radiate, placed also in the disk; proper of the disk hermaphrodite, funnel-form, five-cleft, erect;—of the ray female, ligulate, lanceolate, the length of the common calix. *Stamina:* in the hermaphrodites; filamenta five, very short; antheræ cylindric. *Pistil:* in the hermaphrodites; germen oblong; style filiform; stigmas two, filiform, blunt;—in the females; germen oblong; style filiform; stigmas two, filiform, longer. *Pericarp:* none. *Calix:* unchanged. *Seeds:* in the hermaphrodites oblong, crowned with very many acute short chaffs;—in the females oblong, crowned also with very many chaffs. *Receptacle:* common chaffy; partial with linear deciduous chaffs. Essential Character. *Calices:* many-flowered. *Corollets:* tubular;—hermaphrodite, with one or two female ligulate florets. *Receptacle:* chaffy. *Down:* of several chaffs.—The species are,

1. Œdera Prolifera. Leaves lanceolate, opposite, ciliate, smooth on both sides. Stem shrubby, compound, with ascending branches, covered below with scars from fallen leaves; leaves opposite, sessile, narrow, acute, channelled, chiefly abounding towards the ends of the branches, green; flowers terminal, solitary, yellow; seeds uniform, oblong, compressed, light brown.—Native of the Cape, growing in sandy situations.

2. Œdera Aliena. Leaves linear, tomentose underneath. Stems two or three feet high, very leafy, round, glaucous, branched; leaves numerous, scattered, resembling those of Rosemary; flowers erect, of a very showy yellow, as large as those of Marigold. The genus of this plant is doubtful; it has the appearance of Stachlina or Gnaphalium, with the flowers of Calendula.—Native of the Cape.

3. Œdera Hirta. Leaves ovate, entire, hairy.—Native of the Cape.

Œnanthe; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal with fewer rays; partial heaped, with very many rays, but very short, insomuch that there are often none;—universal involucre many-leaved, simple, shorter than the umbel;—partial many-leaved, small, proper: perianth five-toothed, awl-shaped, permanent. *Corolla:* universal difform, rayed; florets of the ray abortive; proper of the disk hermaphrodite, with five inflex, cordate, almost equal petals; proper of the ray, male, with five very large, unequal, inflex, bifid petals. *Stamina:* filamenta five, simple; antheræ roundish. *Pistil:* germen inferior, oblong; furrowed; styles two, awl-shaped, permanent; stigmas blunt. *Pericarp:* none; fruit subovate, crowned with the perianth and pistil, bipartile. *Seeds:* two, subovate, on one side convex and striated, on the other flat, toothed at the top. *Observe.* The perianth is more manifest in this genus than in the other umbellate plants. Essential Character. *Florets:* difform; in the disk sessile, barren. *Fruit:* crowned with the calix and pistil, its bark corky.—The species are,

1. Œnanthe Fistulosa; *Common Water Dropwort.* Stoloniferous; stem-leaves pinnate, filiform, fistular. Roots tuberous: according to Haller, they are diffused widely in the water and mud, where they sometimes have bundles of fibres hanging to them; in gardens they are little bulbs. Stem from twelve to eighteen inches, and even two feet in height, rushy, upright, striated, smooth, green, and glaucous, except at the bottom, where it is red, and hollow within. The smell is unpleasant, and the taste hot and nauseous, as in many of the umbellate plants. This root is said to be poisonous, and to have killed within three days; and that out of seventeen Corsican soldiers, who had eaten of it, three died, the rest being cured by emetics. Linneus affirms that cows and horses refuse it, though on experiment it did not appear to be noxious to the former. Schreber informs us that it is left untouched by cattle. The seed is slightly aromatic. So little were deleterious effects suspected in this plant, that it was recommended formerly, in common with many umbellate plants, as a diuretic, and good in the stone and gravel: but Linneus's is a good general rule, that aquatics of this natural order, if not absolutely poisonous, are at least to be distrusted.—Native of most parts of Europe, in ponds, ditches, by river sides, in wet meadows, and marshes, flowering in June and July. This plant will grow very well in the common ground, as will also the second and sixth species.

2. Œnanthe Peucedanifolia; *Sulphurwort-leaved Water Dropwort.* All the leaves linear; root-leaves bipinnate; stem-leaves pinnate; universal involucre none; tubers of the root ovate, sessile. The roots of this are composed of many cylindric, ovate, white, sessile tubers, collected into a bunch, each terminating in a white fibre at the base. Dr. Withering, who considers this as only a variety of the preceding, says, that in the plants which he procured in the Isle of White, the leaflets are three or four inches long, whereas in the preceding they are rarely more than half or three quarters of an inch in length. Dr. Plot observed it in the ditches about Medley and Binsey common, and almost every where about Oxford; at Blackstone, on Wandsworth common; in Harefield river; and at Ham Abbey in Essex: Dr. John Sibthorp found it on the banks of the Isis beyond Iffley, and on peat bogs under Headington Wick copse. See the first species.

3. Œnanthe Crocata; *Hemlock Water Dropwort.* All the leaves many-cleft, blunt, nearly equal; stalks four or five feet high, emitting a yellowish fetid juice when broken. The root divides into four or five large taper ones, which,

when separated, bear some resemblance to Parsneps, for which some ignorant persons have boiled them. An infusion of the leaves, or three tea-spoonfuls of the juice of the root, taken every morning, effected a cure in a very obstinate cutaneous disease, but not without occasioning a very great disturbance and suffering in the constitution. The country people in Westmoreland apply a poultice of the herb to the ulcer which forms in the forepart of the hoof in horned cattle, and is called *the foul*. Dr. Withering says, the whole of this plant is poisonous; and Dr. Pulteney remarks, that the root is the most virulent of all the vegetable poisons that Great Britain produces. Many instances of its fatal effects are recorded, wherein it has been eaten for Water Parsneps, or Celery, which it very much resembles in its leaves. Mr. Ehret, the botanic painter, was heard to say, that while he was drawing this plant, the smell rendered him so giddy, that he was several times obliged to quit the room, and walk out in the fresh air, to recover himself; but that having opened the door and windows of the room, the free air enabled him to finish his work. A large spoonful of the juice of this plant being given to a dog, made him very sick and stupid, but in about an hour he recovered. Goats and sheep eat it with impunity, but horses and cattle refuse it. It may be safely used in external applications, but should be taken with great caution internally, as is evident from the above account, and also from the following. It is recorded in the *Philosophical Transactions*, that two French prisoners at Pembroke died by eating the root, which the inhabitants of that place call Five-fingered Root, and use as a cataplasm for the felon, or worst kind of whitlow. Eight young lads near Clonmel in Ireland, where the plant is called Tahow, mistook the root for the Water Parsnep, and having eaten of it, five of them died. Dr. Allen mentions an instance of four children, who had eaten of these roots, but by proper care did well; and also that a hog having grubbed up and eaten some of the roots, died in convulsions; Mr. Miller himself informed Sir William Watson, that a whole family were poisoned with this plant at Battersea. The method of cure is, to empty the stomach and intestines as soon as possible, and then to cause the patient to swallow large quantities of olive oil, or of oleaginous fluids; this is attended with difficulty, because the jaws are, as it were, locked together by the violence of the spasm. Hence the necessity of caution respecting this dangerous plant becomes very obvious, especially as it abounds in some places, and resembles Smallage very much; besides, the flavour of the root is by no means disagreeable, and is likely to prove very tempting to children.—It will not grow except in muddy places; and whoever wishes to cultivate it for botanical or medical purposes, must treat it accordingly, by planting it in very moist places.

4. Œnanthe Prolifera; *Proliferous Water Dropwort*. Marginal pedúncles of the umbels longer branched, male; root perennial, consisting of several tubers, which are round, narrowing to each end, long, of a dirty brown on the outside, white within; stem herbaceous, a foot and a half in height, upright, a little branched, green, angular, striated. It flowers in June and July.—Native of Sicily, and Italy.

5. Œnanthe Globulosa: *Globular-headed Water Dropwort*. Fruits globular; roots like those of Navew, perennial, branched; stem a foot high, or more, branched, angular at the base, and often purple. It flowers in June and July.—Native of Portugal.

6. Œnanthe Pimpinelloides; *Parsely Water Dropwort*. Root leaflets wedge-shaped, cloven; those of the stem entire, linear, very long, simple.—Native of the southern parts of Europe, and of England, growing in marshes, especially near the sea-coast; as at Quaplod in Lincolnshire; near Spalding; Hinton Moor, in Cambridgeshire; Bulvan Fen in Essex; near Mortlake; and between Sydenham and Southend.

7. Œnanthe Inebrians. Pinnas of the lower leaves ovate, of the upper linear; petioles angular.—Native of the Cape.

8. Œnanthe Tenuifolia. Leaves bipinnate; pinnas linear, the upper ones undivided.—Native of the Cape.

9. Œnanthe Ferulacea. Leaves superdecompound; pinnules awl-shaped, grooved.—Native of the Cape.

10. Œnanthe Interrupta. Leaves interruptedly bipinnate; segments gash-serrate.—Native of the Cape.

11. Œnanthe Exaltata. Stems striated; seeds turbinate, striated.—Native of the Cape.

Œnothera; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, superior, deciduous; tube cylindrical, erect, long, deciduous; border four-cleft, the segments oblong, acute, bent down. *Corolla:* petals four, obcordate, flat, inserted into the interstices of the calix, and the same length with the divisions of the calix. *Stamina:* filamenta eight, awl-shaped, curved inwards, inserted into the throat of the calix, shorter than the corolla; antheræ oblong, incumbent. *Pistil:* germen cylindric, inferior; style filiform, the length of the stamina; stigma four-cleft, thick, blunt, reflex. *Pericarp:* capsule cylindrical, four-cornered, four-celled, four-valved, with contrary partitions. *Seeds:* very many, angular, naked: receptacle columnar, free, four-cornered, with the angles contiguous to the margins of the partitions. Essential Character. *Calix:* four-cleft. *Petals:* four. *Capsule:* cylindrical, inferior. *Seeds:* naked.—This is an ornamental genus of herbaceous plants, chiefly American. They are all proper for affording ornament and variety, either in the open ground, or among other potted plants.——The species are,

1. Œnothera Biennis; *Broad-leaved Tree Primrose*. Leaves ovate-lanceolate, flat. Stem muricated, subvillose; root fusiform, fibrous, yellowish on the outside, white within, biennial. From these, the first year, arise many obtuse leaves, which spread flat on the ground: from among these, in the second year, the stems come out; they are three or four feet high. The flowers are produced all along the stalks, on axillary branches, and in a terminating spike: they are of a fine pale yellow colour, and delicately fragrant. They usually open between six and seven o'clock in the evening: and hence the plant is called the Evening, or Night Primrose. The mode of their expanding is curious: the petals are held together at top by the hooks at the end of the calix, the segments of which first separate at bottom, and discover the corolla, a long time before it acquires sufficient expansive force to unhook the calix at top; when it has accomplished this, it expands very fast, almost instantaneously, to a certain point, and then makes a stop, taking a little time to spread out quite flat; it may be half an hour from the first bursting of the calix at bottom, to the final expansion of the corolla, which commonly becomes flaccid in the course of the next day, sooner or later, according to the heat or coolness of the weather. The uppermost flowers come out first in June, the stalk keeps continually advancing in height, and there is a constant succession of flowers till late in autumn. The roots are eaten in some countries in the spring; for though a native of North America, it has been imported, first into Italy, and has been carried all over Europe.—We often meet with it in English gardens, where it is cultivated as a hardy plant, in the following way: sow the seeds in autumn; when the plants appear, thin them, and keep them clean; the following autumn, transplant them to places where they are designed to flower: as the roots strike deep in the ground, care should

be taken not to break them in removing. They will thrive in almost any soil or situation; and will flower even in London, better than most other plants. If they be once introduced, and permitted to scatter, there will be a supply of plants without any care.

2. Œnothera Grandiflora; *Great-flowered Tree Primrose.* Leaves ovate-lanceolate; stamina declined; stem shrubby. Biennial, flowering in July and August.—Native of North America. This, and the fifth, sixth, and seventh species, are commonly considered as green-house plants, though they produce flowers and seeds in the open air, and are therefore seldom preserved.

3. Œnothera Parviflora; *Small-flowered Tree Primrose.* Leaves ovate-lanceolate, flat; stem even, subvillose. It does not rise so high as the first species, the leaves are narrower, and the flowers smaller.—Native of North America.

4. Œnothera Muricata; *Muricated Tree Primrose.* Leaves lanceolate, flat; stem purple, muricated.—Native of Canada.

5. Œnothera Longiflora; *Long-flowered Tree Primrose.* Leaves toothletted; stem simple, hairy; petals distant, two-lobed; root biennial; root-leaves numerous, broad-lanceolate, toothletted, pubescent, with a white rib, obliquely nerved. Mr. Curtis remarks, that luxurious specimens of this plant exceed five feet in height; that the flowers are uncommonly large and showy, and continue blowing from July to October. —Native of South America. The plant is annual, of ready growth, and very productive of seeds, which ripen early. Sow them in the open border, where they are intended to flower, in March, or the beginning of April. A single plant is sufficient for one spot. Put a stick of four feet long to it when young, and tie up the branches to the stick when they are about a foot long.

6. Œnothera Mollissima; *Soft Tree Primrose.* Leaves lanceolate, waved, pubescent, very soft; stalk shrubby, more than two feet high, hairy; flowers axillary like the other sorts, at first pale yellow, but as they decay changing to an orange colour. It flowers from June to October. Biennial.—Native of South America. Propagated like the first species.

7. Œnothera Rosea; *Rose-flowered Tree Primrose.* Leaves ovate-toothed; lower ones lyrate; capsules club-shaped. It rarely exceeds a foot in height; its rose-coloured flowers expand during the whole of the day, and are produced during most of the summer months. This, and the next species, may be increased either by cuttings or seeds. This species produces abundance of seed, which should be sown in the spring with tender annuals: when the plants have acquired a proper age, and the season is favourable, plant them out singly in the open border.

8. Œnothera Purpurea; *Purple Tree Primrose.* Leaves ovate, lanceolate, glaucous, quite entire; capsules sessile; stigma dark purple. This is distinguished by the glaucous appearance of its foliage, the purple hue of its corolla, and the dark colour of its stigma. It is about two feet high, and produces abundance of fine purple flowers in July and August, which open like those of the seventh species during the day. —Cultivated in the same way as the preceding species.

9. Œnothera Sinuata; *Scallop-leaved Tree Primrose.* Leaves tooth-sinuate; capsules prismatic. Root annual; stem simple, round, a foot high, upright, nodding at top, when young hairy, when old smoothish; branches alternate. It sleeps during the night, with the upper leaves hollowed.—Native of North America.

10. Œnothera Fruticosa; *Shrubby Tree Primrose.* Leaves lanceolate, somewhat toothed; capsules pedicelled, acute-angled; raceme peduncled. Stem three or four feet high, round, hairy, pale red. This is a perennial, but altogether herbaceous, at least with us, and therefore improperly named *Fruticosa.* The flowers, which are large and showy, bright yellow, though they open in the evening, remain expanded during most of the ensuing day. The flower-buds, germen, and stalk, are enlivened by a richness of colour which contributes to render this species one of the most ornamental and desirable of the genus.—Native of Virginia. It may be increased by seeds, by parting the roots, and by cuttings, in the open air.

11. Œnothera Pumila; *Dwarf Tree Primrose.* Leaves lanceolate, blunt, smooth, subpetioled; stems prostrate, (ascending;) capsules acute-angled. This is distinguished from all the species with yellow flowers, by the inferiority of its size; in its most luxuriant state, rarely exceeding a foot in height, and commonly far more humble. It sends up many flowering-stems, producing blossoms from April to July, open in the morning as well as the evening. The stalks are rather ascending than prostrate.—Native of North America. It may be propagated by parting the roots, or by seeds. The best time for the former is the spring: but seeds should be sown in the autumn in pots, placed under a hot-bed frame in winter. In the spring the plants will appear: when fit to remove, plant a few in small pots, to be sheltered under a common frame in winter; plant the others in a sheltered border, where they will endure the cold of our ordinary winters well, and in the following summer produce flowers and seeds in plenty. The seedling plants will be much stronger, and flower better, than those from offsets.

12. Œnothera Macrocarpa. Stem branchy; leaves lanceolate, petiolate, distantly glandulous-denticulate, with the margin and nerves of a silky white colour; petals obcordated with a point; capsules elliptical, four-winged, with very short pedicels.—Grows on the banks of the Mississippi, near St. Louis. "This species," Mr. Pursh remarks, "exceeds in size and beauty of its flowers any other one known; they are of a bright yellow, very large, and open about five o'clock in the evening. The calix is covered with a very fine and white silky down, and is spotted with purple." It has not yet been found any where else but near St. Louis, where Mr. Thomas Nuttall gathered the ripe fruits of it; specimens of which he sent to this country.

13. Œnothera Fraseri. Plant somewhat glabrous; stem on the lower part simple, but branchy above; leaves ovate, petiolate, glandulose-denticulate; racemes leafy; capsules pedicellated, obovate, tetragonal.—Native of South Carolina. "This species," Mr. Pursh informs us, "approaches so near to Œnothera Fruticosa, that it is difficult to define the distinction, though their other habits are so very different. The present species flowers a short time; the stems decay, and form immediately a tuft of large radical leaves. Œnothera Fruticosa flowers till late in autumn, and never shews its radical leaves in that manner. The specific difference of Œnothera Fruticosa from Œnothera Fraseri will be: Œnothera Fruticosa,—Plant slightly pubescent; stem branchy from the base, divaricate; leaves sessile, lanceolate, subdentate, acute; capsules pedicellate, oblong-clavate, angular."

14. Œnothera Scapigera. Plant without a stem; leaves lanceolate, inciso-dentate; capsule oblong, sessile; tube of the calix very long; petals two-lobed, distant.—Grows on the banks of the Missouri, where Mr. Lewis discovered it. This singular species resembles the Œnothera Acaule of Cavanilles. The flowers open in the evening, are white, changing to red, and of an agreeable scent.

15. Œnothera Albicaulis. Plant very slightly pubescent; stem and nerves of the leaves white; leaves pinnatifid; segments divaricated; flowers subspicate, large, white; germen

sessile, cylindrical; stamina shorter than the corolla; petals obcordate.—Native of Upper Louisiana.

16. Œnothera Linearis. The whole plant pubescent, slender; leaves linear, entire; capsule stipitated, subrotund-tetragonal, villose.—Grows in the dry barren fields of Virginia and Carolina.

17. Œnothera Chrysantha. Stalk feeble, pubescent; leaves lanceolate, plain, entire, somewhat obtuse; tube of the calix as short again as the segments; capsule clavated, acute-angled, sessile; flowers small, of a golden yellow colour.—Grows on the barren lands of Canada, and on the mountains of Pennsylvania and Carolina, and flowers in July and August.

18. Œnothera Pusilla. Plant upright, subpubescent; stalk small, somewhat simple; leaves lanceolate-oblong, somewhat obtuse, entire; flowers axillary at the summit, small; capsule sessile, clavate-turbinate, with eight nearly equal sides.—Michaux discovered this plant on the rocks near Lake Mistassino.—It has also been found on the high mountains of Pennsylvania and Virginia.

19. Œnothera Minima. Stalk simple, one-flowered; leaves small, lanceolate, very entire, hairy; flower sessile, rough; germen prismatic.—Grows in the barren pine-woods of Georgia. This plant seldom exceeds an inch in height, and its flower is the smallest of all the genus.

20. Œnothera Glauca. Plant very smooth; leaves wide-oval, repand-subdentate, smooth, hoary; capsule ovate tetragonal, pedicellate.—Grows on the banks of the Mississippi, in Illinois, and on the peaks of Otter, Virginia; and flowers in July.

21. Œnothera Hybrida. Stalk erect, villose; leaves pubescent on both sides, lanceolate, remotely subdentate, wavy; capsule subspicate, standing on a short pillar, ovate-tetragonal.—Grows in the sandy fields of Virginia and Carolina.

Oil Seed, Oil Tree. See *Ricinus.*

Oily Grain. See *Sesamum.*

Olax: a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, concave, very short, quite entire; according to Gærtner, trifid, with blunt teeth. *Corolla:* one-petalled, funnel-form; border trifid, blunt, the third segment deeper; nectaries four, (according to Gærtner, three,) round, petioled, shorter than the corolla. *Stamina:* filamenta three, awl-shaped, alternate with the nectaries, and shorter; antheræ simple. *Pistil:* germen superior, roundish; style filiform, longer than the stamina, caducous; stigma capitate. *Pericarp:* berry fleshy, three-celled, half covered with the permanent calix and corolla. *Seeds:* several, six or eight in each cell, small, oblong, pale, with a navel in the middle of the inner side. Essential Character. *Calix:* entire; trifid, according to Gærtner. *Corolla:* funnel-form, trifid. *Nectary:* four; three, according to Gærtner. *Berry:* three-celled, many-seeded.——The species are,

1. Olax Zeylanica. This is a tree, with flaccid branches, wrinkled like those of Viscum or Misletoe, alternate; leaves ovate, smooth, veinless, alternate, quite entire, petioled; peduncles very short, somewhat branched, from the axils of the leaves. Native of Ceylon.

2. Olax Scandens. Leaves elliptic, obtuse, downy beneath; calix minutely fringed; flowers in short axillary clusters, small, whitish.—Native of forests on the coast of Coromandel, flowering all the year.

Oldenlandia: a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth four-parted, the parts awl-shaped, superior, permanent. *Corolla:* one-petalled; tube cylindrical, closed by a beard; border four-parted, acute, spreading, a little longer than the calix. *Stamina:* filamenta four, simple, within the tube; antheræ small. *Pistil:* germen roundish, inferior; style simple, the length of the stamina; stigma bifid, obtuse. *Pericarp:* capsule twin, roundish, two-celled, opening between the teeth of the calix. *Seeds:* numerous, very small. *Observe.* According to Schreber, this genus scarcely differs from *Hedyotis;* there is, however, a difference in the calix, corolla, and receptacle. Essential Character. *Calix:* fastened to the pericarp, with four free awl-shaped teeth at top. *Corolla:* one-petalled, four-cleft. *Capsule:* inferior, two-celled. *Receptacles:* free, fastened to the partition by the base only.—To propagate the plants of this genus, sow the seeds early in the spring on a hot-bed; and when the plants come up, transplant them to another hot-bed, or into small pots plunged into the bark-bed. Water and shade them until they have taken root; then give them free air in warm weather, and frequently refresh them with water. Some seeds will ripen in July: gather them from time to time, as they become ripe; for there will be fresh flowers produced until autumn. Or, if the seeds be permitted to scatter in the pots, the plants will soon appear, and will live through the winter in the stove, and flower early in the following spring.——The species are,

1. Oldenlandia Verticillata; *Whorled Oldenlandia.* Flowers in whorls, sessile; stipules bristle-bearing; stems about a foot high, simple, jointed, even, round, with a groove on each side.—Native of Amboyna and Jamaica, on open hills.

2. Oldenlandia Repens; *Creeping Oldenlandia.* Capsules sessile, hispid; leaves lanceolate; stem creeping, filiform, branched, jointed, rooting at every joint, even.—Native of the East Indies, and of China near Canton.

3. Oldenlandia Capensis; *Cape Oldenlandia.* Flowers in whorls, peduncled; leaves linear. It strongly resembles the above.—Native of the Cape.

4. Oldenlandia Uniflora; *One-flowered,* or *Water Oldenlandia.* Peduncles quite simple, lateral; fruits rough-haired; leaves subovate, acute; stems branched and creeping. In Jamaica it is found frequently in the waters, and then grows of a length proportioned to the depth of the stream, with which it yields and bends: both leaves and stalks are then of a reddish colour. Sometimes it is found upon the banks, and then it is of a green colour, and a creeper, generally running more or less, according to the quantity of moisture.—Native of Virginia and Jamaica.

5. Oldenlandia Biflora; *Two-flowered Oldenlandia.* Peduncles two-flowered, longer than the petioles; leaves lanceolate; root very long, from one to two feet, slender, with a few lateral fibres; when fresh, the bark is orange-coloured; in the cultivated sort it is longest, and with fewest fibres; stem in the cultivated sort erect, round, jointed below, very ramous, somewhat scabrous, from six to twelve inches high.—Native of the East Indies.

6. Oldenlandia Umbellata; *Umbelled Oldenlandia,* or *East India Madder.* Umbels naked, lateral, alternate; leaves linear. This is a small biennial, but sometimes triennial plant; root very long; stem in the cultivated sort erect. It is used in dyeing red, purple, a deep clear brown, and orange, and to paint the red figures on chintz. The woody part of the *Chay* root, as it is called, is white and tasteless; it is the bark only that is possest of the colouring principle: when fresh, it is orange-coloured, tinges the spittle yellow, and leaves a slight degree of acrimony on the point of the tongue for some hours after chewing; to appearance it loses its yellow colour in drying, but still retains the above property on being chewed. It

impregnates cold water or spirits with a straw colour; to boiling water it gives a brownish porter colour. The watery infusions and spirituous tinctures are changed into a bright and deep red by alkaline substances; and are rendered paler, or nearly destroyed, by acids. The colouring powers of this root are said to improve by keeping three or four years. When the wild sort can be had in any quantity, it is esteemed a third or fourth stronger, and yields a better colour; and when these roots can be had of two years' growth, they are reckoned still better. This plant is the Tsherl Vello of the Telingas; and the Say a Ver, or Imburel, of the Tamuls. The Telinga physicians do not give any part of the plant a place in their materia medica; but the Malabar physicians say that the roots cure poisonous bites, colds, and cutaneous disorders, and warm the constitution.—This plant has been introduced into the island of Jamaica; it is a native of the East Indies, growing in very light, dry, sandy ground, near the sea; flowering during the latter part of the wet season; and ripening seeds in January. It is much cultivated on the coast of Coromandel, where its roots descend to a great depth in the sand.

7. Oldenlandia Hirsuta; *Hairy Oldenlandia.* Umbels axillary; stem and calices hispid; leaves ovate, acute. This is a diffused plant.—Native of Java.

8. Oldenlandia Corymbosa; *Hyssop-leaved Oldenlandia.* Peduncles many-flowered; leaves linear-lanceolate. This is a low annual plant, seldom above three or four inches high, dividing into many branches, which spread near the ground.—Native of Jamaica.

9. Oldenlandia Paniculata; *Panicled Oldenlandia.* Peduncles panicled, terminating; leaves oval, lanceolate; stem almost upright, even, dichotomous; flowers purple.—Native of the East Indies.

10. Oldenlandia Pentandra; *Five-stamined Oldenlandia.* Flowers five-stamined, one-styled; leaves linear; peduncles two-flowered.—Native of the East Indies.

11. Oldenlandia Digynia; *Two-styled Oldenlandia.* Flowers five-stamined, two-styled, sessile; leaves lanceolate.—Native of the East Indies.

12. Oldenlandia Trinervia; *Three-nerved Oldenlandia.* Stem decumbent; leaves ovate, three-nerved; flowers in whorls, axillary; capsules hispid; root branched, slender.—Native of the East Indies.

13. Oldenlandia Fœtida; *Stinking Oldenlandia.* Umbel terminating, trichotomous; leaves spatulate.—Native of Tongataboo in the South Seas.

14. Oldenlandia Debilis; *Weak Oldenlandia.* Umbels axillary, peduncled, few-flowered; leaves ovate, sessile.—Native of the island of Tongataboo.

15. Oldenlandia Tenuifolia; *Fine-leaved Oldenlandia.* Peduncles axillary, solitary, one-flowered; leaves linear, subulate.—Native of the East Indies.

16. Oldenlandia Zanguebariæ; *African Oldenlandia.* Peduncles few-flowered; corollas salver-shaped; leaves linear; stem herbaceous, manifold, eight inches high.—Native of the eastern coast of Africa.

Old Man's Beard. See *Isnardia.*

Olea; a genus of the class Diandria order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, small, deciduous; mouth four-toothed, erect. *Corolla:* one-petalled, funnel-form; tube cylindrical, the length of the calix; border four-parted, flat; segments subovate. *Stamina:* filamenta two, opposite, awl-shaped, short; antheræ erect. *Pistil:* germen roundish; style simple, very short; stigma bifid, thickish, with the clefts emarginate. *Pericarp:* drupe subovate, smooth, one-celled. *Seed:* nut ovato-oblong, wrinkled; according to Gærtner, subbilocular. *Observe.* The third species has male and female flowers on the same plant with the hermaphrodites; the nut obovate, substriated, perforated at the base. Essential Character. *Calix:* four-cleft, with subovate segments. *Drupe:* one-seeded.——The species are,

1. Olea Europæa; *European Olive.* Leaves lanceolate, quite entire; racemes axillary, contracted. There are many varieties of this species: viz. 1. The common European Olive: leaves lanceolate, flat, hoary underneath. 2. The Warted Olive: leaves lanceolate, flat, villose underneath; branches warted. 3. The Long-leaved European Olive: leaves linear-lanceolate, flat, silvery underneath. 4. The Broad-leaved European Olive: leaves oblong, flat, hoary underneath. 5. The Iron-coloured European Olive: leaves lanceolate, ferruginous underneath. 6. The Twisted-leaved European Olive: leaves oblong, bent obliquely, pale underneath. 7. The Box-leaved European Olive: leaves oblong, oval; branches spreading, divaricated.—The Olive, in all ages, has been held in peculiar estimation, as the bounteous gift of heaven; and is still the pleasing emblem of peace and plenty. It seldom becomes a large tree; but two or three stems frequently rise from the same root, from twenty to thirty feet high, putting out branches almost their whole length, covered with a grey bark. The leaves are stiff, about two inches and a half long, and half an inch broad in the middle, gradually diminishing to both ends, of a lively green on their upper side, and hoary on their under, standing opposite. The flowers are produced in small axillary bunches; they are small, white, and have short tubes, spreading open at top.—Unripe olives pickled, especially the Provence and Lucca sorts, are very grateful to many persons, who suppose them to excite appetite and promote digestion. They are prepared by repeatedly steeping them in water, to which some add alkaline salt or quicklime, in order to shorten the operation; after this they are washed, and preserved in a pickle of common salt and water, to which an aromatic is sometimes added. But the principal consumption of Olives is in the preparation of common salad oil. The best is of a pale bright amber colour, bland to the taste, and without any smell. It becomes rancid by age, especially if kept in a warm place, and congeals by cold at 38° of Fahrenheit's thermometer, and does not become rancid if kept in a degree of cold equal to the freezing point of water. The Neapolitans extract the oil by crushing the fruit to a paste with a perpendicular mill-stone, running round a trough. This paste is put into flat round baskets, made of rushes, piled one upon another under the press. After the first pressure scalding water is poured into each basket, its contents stirred up, and the operation repeated till no more oil can be skimmed off the surface of the tubs beneath; but by this method the oil is seldom pure, does not keep well, and soon grows rancid. Another process is recommended, which is performed by pounding the fruit in a mortar.—A handful of the crushed substance is thrown into a long woollen bag, which is rubbed very hard upon a sloping board, and then wrung; afterwards hot water is added, and it continues to be pressed as long as a drop of oil can be extracted. This is supposed to have been the original process; and when performed by a stout and skilful workman, is thought much more effectual than the common mode of proceeding.—The ancients considered the Olive to be a maritime tree, and they supposed it would not thrive at any distance from the sea; though by experience we find it will succeed very well in any country where the air is of a proper temperature; it will however bear the spray of the sea better than most trees. With a

little protection in severe frosts, an Olive-tree may be maintained against a wall; and in Devonshire there are some of these trees which have grown many years in the open air without being injured by frost, though their summers are not warm enough to bring their fruit to maturity. Notwithstanding the general preference which the oil of Olives and of Almonds have obtained by their fluidity, all the mild vegetable oils are nearly of the same nature. Oil, in various shapes, forms a considerable part of our food, both animal and vegetable, and affords much nourishment; but in some constitutions oily substances do not unite with the contents of the stomach, especially where acids abound. Oil internally used is supposed to correct acrimony, to lubricate and relax the fibres, and hence is prescribed in coughs, catarrhal affections, and erosions, in worm cases, in nephritic pains, spasms, colics, constipations of the bowels, and to prevent the effects of poison, &c. Externally, it has been found a useful application to bites and stings of poisonous animals, to burns, tumors, &c.; either applied alone, or mixed with liniments and poultices. It was much used by the ancients to rub over their bodies; this has been found of great service in dropsies, particularly in ascites: it is said to have been successful in rabies canina; but having been since resorted to in a similar case, without success, little confidence can be placed on a solitary instance. Though the effects of oil taken internally extend over the primæ viæ, yet it may be doubted whether it produces any medicinal effect after having passed into the blood. It is an ingredient in several officinal compositions; and when united with water by the intervention of alkali, is usually given in coughs, hoarseness, &c.—The Olive-tree will grow almost in any soil; but when it is planted in rich moist ground, the tree grows larger, and makes a finer appearance, than in poor land; but the oil is not so good as in a leaner soil. Calcareous ground is esteemed the best for these trees, the oil being finer, and keeping longer than any other. In Languedoc and Provence, they propagate the Olive by truncheons, split from the roots of the trees. When their tops are killed by hard frost in winter, they send up several stalks from the root; when these are grown pretty strong, they separate them with an axe from the root, in doing which, they are careful to preserve a few roots to them. These are cut off in the spring, after the danger of the frost is over, and planted about two feet deep in the ground, covering the surface with litter or mulch, to prevent the sun and wind from penetrating the ground and drying the roots; when the plants have taken new root, they stir the ground, and destroy the weeds. In countries where the inhabitants are curious in making oil, they graft their truncheons with that sort of Olive which they prefer. Stubborn lands, and unkindly hills, where the soil is a potter's clay mixed with pebbles, and producing only bushes, are adapted to the Olive, which is a long-lived slow-growing tree. That such lands are congenial to this tree, is evident from the abundance of wild olives that spring in them, and the quantity of berries strewn over them.—In England the Olive may be propagated by laying down the tender branches in the same way as for other trees, which should remain undisturbed two years; in which time they will have put out roots, and may then be taken off from the old plants, and transplanted either into pots filled with fresh light earth, or into the open ground, in a warm situation. The best season for transplanting is the beginning of April, when you should, if possible, take the opportunity of a moist season; and those which are planted in pots should be placed in a shady part of the green-house, until they have taken root: but those planted in the ground should have mulch laid about their roots, to prevent the earth from drying too fast, and be now and then refreshed with water; but you must by no means let them have too much moisture, which will rot the tender fibres of their roots, and destroy the trees. When the plants have taken fresh root, those in the pots may be exposed to the open air, with other hardy exoties, with which they should be housed in winter, and treated as Myrtles, and other less tender trees and shrubs; but those in the open air will require no farther care until the winter following, when you should mulch the ground about their roots, to prevent the frost from penetrating deep into it: and if the frost should prove very severe, you should cover them with mats, which will defend them from being injured thereby; but you must be cautious not to let the mats continue after the frost is past, lest their leaves and tender branches should turn mouldy for for want of free air; which will injure them as much, if not more, than if they had been exposed to the frost; for it often happens that the frost only destroys the tender shoots, but the body and larger branches remaining unhurt, they put out again in the succeeding spring. These trees are generally brought over from Italy every spring, by the importers of Orange-trees, Jasmines, &c. who sell them at a reasonable price; and as the trees they bring over have often stems of a size to which young plants in this country would not arrive in ten or twelve years, it is better to purchase of them, than to undertake the tedious process of raising them by layers. When you procure these stems, first soak their roots twenty-four hours in water, and clean them from the filth they have contracted in their passage; then plant them in pots filled with fresh light sandy earth, and plunge them into a moderate hot-bed, observing to screen them from the violence of the sun in the heat of the day, and also to refresh them with water, whenever you find the earth in the pots dry. In this situation they will begin to shoot in six weeks or two months after, when you should let them have air in proportion to the warmth of the season, and after they make tolerably strong shoots, inure them to the open air by degrees; and place them, when wholly removed into it, in a situation where they may be defended from strong winds; in this place they should remain till October following, when they should be removed into the green-house, as before directed. Having thus managed these plants until they have acquired strong roots, and made tolerably good heads, you may draw them out of the pots, preserving the earth to their roots, and plant them in the open air in a warm situation, where you must manage them as was before directed for the young ones: and these will in two or three years produce flowers; and in very warm seasons some fruit, provided they do well. The Lucca and Box-leaved Olives are the hardiest, and of course the best to plant in the open air; but the first sort produces the largest trees.

2. Olea Capensis; *Cape Olive.* Leaves ovate, quite entire; racemes panicle-shaped, divaricate. This is a small shrub, with a straight jointed trunk, and subhirsute bark. Corolla small and white.—Native of the Cape.

3. Olea Americana; *American Olive.* Leaves lanceolate, elliptic, quite entire; racemes narrowed; all the bractes permanent, connate, small. There are male and female flowers in this species, on the same plant with the hermaphrodites.—Native of Carolina and Florida.

4. Olea Cernua; *Nodding-flowered Olive.* Leaves oblong, lanceolate, very blunt; racemes axillary, simple; flowers drooping; branches round, smooth, with an ash-coloured bark, and raised scattered dots, compressed a little at top; flowers twice as large as in the common sort.—Native of Madagascar.

5. Olea Apetala; *Apetalous Olive.* Leaves elliptic; flowers in racemes, apetalous; branches round at bottom, with an

ash-coloured dotted bark, alternately compressed towards the top.—Native of New Zealand.

6. Olea Excelsa; *Laurel-leaved Olive.* Leaves elliptic, acute; bractes perfoliate, the lowest cup-shaped, permanent, the upper ones leafy, large, deciduous; branches round, with a smooth ash-coloured bark, with raised dots scattered over it; flowers twice as large as those of the Common Olive; calix very small, with very blunt teeth.—Native of Madeira.

7. Olea Fragrans; *Sweet-scented Olive.* Leaves lanceolate, serrate; peduncles lateral, aggregate, one-flowered. The flowers are small, and white, with a scent like the highest perfumed green tea. This is a large tree, which Osbeck mentions as one of the ornamental trees in the Chinese gardens. He says it is about six yards high, with small white sweet-scented flowers, three or four in one involucre. It flowers in July and August.—Native of China, Cochin-china, and Japan.

Oleander, or *Rose-bay.* See *Nerium.*

Oleaster. See *Elæagnus.*

Olive. See *Olea.*

Olyra; a genus of the class Monœcia, order Triandria.—Generic Character. *Male Flowers*, below the females. *Calix:* glume two-valved, one-flowered; valves equal, lanceolate; outer subventricose, terminating in a capillary straight even awn; inner narrower, acute, folded in on both sides. *Corolla:* none; nectary two-leaved, very small; leaflets obovate, subemarginate, membranaceous, erect. *Stamina:* filamenta three, capillary, very short; antheræ linear, acute at both ends. *Female Flowers*, solitary, terminating on the same panicle, much larger than the males. *Calix:* glume two-valved, one-flowered, large, spreading; valves almost equal, ovate, concave, nerved; outer terminating in a long awl-shaped subflexuose awn, villose at bottom; inner narrower, acuminate. *Corolla:* glume two-valved, much shorter than the calix, coriaceous, shining, awnless, blunt; outer much longer; nectary three-leaved, very small; leaflets obovate, membranaceous, erect. *Pistil:* germen oblong; style filiform, almost the length of the calix; stigma capillary, pubescent. *Pericarp:* glume of the corolla involving, falling. *Seed:* ovate. Essential Character. *Male. Calix-glume:* one-flowered, awned. *Corolla:* glume awnless. Swartz says, no corolla. *Female. Calix-glume:* one-flowered, spreading, ovate. *Style:* bifid. *Seed:* cartilaginous.——The species are,

1. Olyra Paniculata. Panicle terminating; culm branching; roots filiform, long, thicker; leaves sheathing, as it were shortly petioled at the end of the sheath, broad, lanceolate, acuminate, horizontal, spreading, smooth, striated, marked with lines below; sheaths pubescent. It flowers from January to July.—Native of the dry coppices in Jamaica.

2. Olyra Pauciflora. Flowers axillary. It flowers in the spring.—Native of woods in Jamaica.

Omphalea; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male Flowers. Calix:* perianth four or five leaved, spreading; leaflets two, opposite, larger, ovate, convex, coloured. *Corolla:* none; nectary-glands four, or a fleshy ring encircling the germen. *Stamina:* filamentum one, columnar, thick, short; antheræ two, oblong, incumbent, connate at the top, polliniferous at the edge; or one plano-convex, trifid. *Female Flowers*, in the same raceme. *Calix:* perianth five-leaved; leaflets three, larger, ovate, encircling the germen. *Corolla:* none. *Pistil:* germen ovate; style none; stigma trifid. *Pericarp:* capsule oblong, or roundish, fleshy, bluntly triangular, three-celled, three-valved. *Seeds:* nuts, solitary, ovate, hard. Essential Character. *Male. Calix:* four-leaved. *Corolla:* none. *Filamentum:* columnar, with the antheræ inserted into it. *Female. Calix:* five-leaved. *Corolla:* none. *Stigma:* trifid. *Capsule:* fleshy, three-celled.—*Nuts:* solitary.——The species are,

1. Omphalea Axillaris. Racemes axillary; leaves distich, ovate, acuminate, shining, on very short petioles; stipules mucronate; stem shrubby.—Native of Jamaica.

2. Omphalea Cauliflora. Racemes cauline, scaly at the base; leaves distich, oblong, acute, shining; stem arborescent.—Native of Jamaica.

3. Omphalea Cordata. Racemes compound, leafy, terminating; leaves scattered, cordate, villose underneath, biglandular at the base; stem scandent.—Native of rocky coppices in Jamaica, and other West India Islands.

4. Omphalea Nucifera; *Cobwort.* Racemes compound, leafy, terminating; leaves scattered, oblong, very smooth, biglandular at the base; stem arboreous. This is a small tree with an upright even trunk, from twelve to fifteen feet high. The kernels of the nut are esculent and sapid, the cotyledons only being emetic. The branches and petioles pour out a tenaceous watery liquor.—Native of Jamaica, where it is frequently cultivated.

Oneberry. See *Paris.*

Onion. See *Allium.*

Onoclea; a genus of the class Cryptogamia, order Filices.—Generic Character. Capsules under the recurved and contracted pinnules of the frond resembling pericarpia.——The species are,

1. Onoclea Sensibilis. Fronds pinnate, subracemose at the tip.—Native of various parts of North America.

2. Onoclea Polypodioides. Fronds bipinnate; fructifications three-valved; root creeping, filiform, shining, rufous.—Native of the Cape of Good Hope, in the fissures of rocks near the Table mountain.

Ononis; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth five-parted, almost the length of the corolla; segments linear, acuminate, slightly arched upwards; the lowest under the keel. *Corolla:* papilionaceous; banner cordate, striated, depressed at the sides more than the other petals; wings ovate, shorter by half than the banner; keel acuminate, as long as, or longer, than the wings. *Stamina:* filamenta ten, connate, in an entire cylinder; antheræ simple. *Pistil:* germen oblong, villose; style simple, rising; stigma blunt. *Pericarp:* legume rhomb-shaped, turgid, subvillose, one-celled, two-valved, sessile. *Seeds:* few, kidney-form. Essential Character. *Calix:* five-parted, with linear segments. *Banner:* striated. *Legume:* turgid, sessile. *Filamenta:* connate, without a fissure.——The species are,

**With Subsessile Flowers.*

1. Ononis Antiquorum. Flowers solitary, larger than the leaflets; lower leaves ternate; branches almost even, spiny; root perennial; stems straight, hard, smooth, and almost woody; flowers purple.—Native of pastures and meadows in Dauphiny, and the southern parts of Europe. This is a hardy plant, and only cultivated in botanic gardens.

2. Ononis Spinosa; *Thorny Rest-harrow.* Flowers axillary in pairs; leaves ternate; upper ones solitary; branches thorny, villose. It has a strong creeping root, which spreads far in the ground, and is with great difficulty eradicated; hence its names of *Restis bovis* and *Arrete bœuf*, or *Oxstopper*, and *Rest-harrow.* Stems a foot and half high, slender, purple, hair, sending out many lateral branches, armed with sharp prickles. The flowers come out singly from the side of the branches, they are of a bright purple colour, marked with lines, and are succeeded by small pods, containing one or two kidney-shaped seeds.—A decoction of the roots has been recommended in cases of stone and jaundice. Meyrick.

observes, that the root is a powerful diuretic, and that the principal virtue of the plant lies in the bark of the root, a strong decoction of which, sweetened to the palate, and drank in large quantities, is excellent against the gravel and all nephritic complaints, softening the parts, and increasing the urinary discharge. It is likewise very effectual in removing obstructions of the liver and other viscera, and has been found serviceable in the dropsy.—It is a very proper plant to be sown on sea and fen banks, as its roots bind the earth very strongly, and creep in all directions. Cows and goats eat it; sheep are fond of it; but horses and hogs reject it. The names this plant has obtained are, *Cammock*, *Petty Whin*, *Grand Furze*, and *Rustburn*. This and the next species are both very troublesome weeds in pastures and corn-fields; as the roots spread and multiply so widely in the ground, and are so tough and strong, that the ploughshare will hardly divide them.

3. Ononis Arvensis; *Hairy Rest-harrow*. Flowers axillary, in pairs: leaves ternate; upper ones solitary; branches unarmed, subvillose. Linneus and others suppose this to be a mere variety of the Thorny Rest-harrow; but Mr. Miller declares that he has cultivated both by seeds, and always found them to retain their difference; which consists in the hairiness of the stalks of this species, which are also more diffused, less upright, without spines, while the leaves are broadre, and sit closer on the branches.—It grows in pastures, and on the borders of corn-fields, chiefly in light lands. A variety has been found on our sea-coasts, near Deal in Kent, and Yarmouth in Norfolk; also by Charlton Church, Woolwich, and Gravesend.

4. Ononis Repens; *Creeping Rest-harrow*. Stems diffused; branches erect; upper leaves solitary; branches unarmed, subvillose. This is very nearly allied to the preceding species, but differs in having the stems procumbent, diffused every way, and in being smaller.—Native of the Levant.

5. Ononis Hircina; *Stinking Rest-harrow*. Flowers subspiked, in pairs; lower leaves ternate, upper solitary, somewhat villose; branches hairy, villose. This species has a strong disagreeable smell, resembling that of goats, and never has any thorns. It seems to be stronger than our Common Rest-harrow, and is recommended by some foreign physicians as a powerful diuretic, and serviceable for cleansing the urinary passages, and in an incipient dropsy. The bark of the root is the most efficacious part of the plant.—Native of Sweden, Germany, Italy, and Hungary.

6. Ononis Serrata; *Serrate-leaved Rest-harrow*. Flowers subsessile, solitary; lower leaves ternate, serrate, toothed, wedge-form, with three teeth usually at the tip; stem herbaceous, round, decumbent, subdichotomous; branches slender. It flowers in June and July.—Native of the south of Europe.

7. Ononis Minutissima; *Small-flowered Rest-harrow*. Flowers subsessile, lateral; leaves ternate, smooth; stipules ensiform; calices scariose, longer than the corolla; flowers sessile, solitary, small, yellow. This is an annual plant, about nine inches high, standing out on two sides; branches towards the bottom.—Native of the south of Europe, flowering in June and July. This a hardy annual plant, propagated by seeds, sown in the place where they are to remain, and requiring no other care but to thin them where they are too close, and to keep them clean from weeds.

8. Ononis Mitissima; *Cluster-flowered Annual Rest-harrow*. Flowers sessile, in spikes; bractes stipular, ovate, ventricose, scariose, imbricated; stem upright, a foot and half high, sending out small side-branches. It rises easily from seeds in the open air, and may be managed as the preceding, together with the other annual hardy sorts.—Native of Spain and Portugal.

9. Ononis Alopecuroides; *Fox-tail Rest-harrow*. Spikes leafy; leaves simple, blunt; stipules dilated. This is an annual plant, rising with an upright branching stalk a foot high.—Native of Spain and Portugal.

10. Ononis Variegata; *Variegated Rest-harrow*. Stipules cordate, very wide, plaited, toothed, emarginate, wider than the leaves; flowers axillary, solitary, subpeduncled; calices shorter than the corolla. Annual.—Native of the sea-coast of the south of Europe; abounding in the island of Sicily.

** *Flowers peduncled, Peduncles awnless.*

11. Ononis Alba; *White Rest-harrow*. Peduncles awnless, very short; leaves simple; stipules dilated, serrate at top; stem a foot high, diffused, round, a little flexuose at bottom, hairy, subviscid branches. This is a mean between the ninth and twelfth species. From the former it differs in its serrate stipules: the floral leaves of the same structure with the stem-leaves, only smaller, not linear, and narrower towards the base. The whole plant is covered with a light down, except the leaves, and it is a little viscid.—Native of Barbary.

12. Ononis Pubescens; *Downy Rest-harrow*. Peduncles awnless, very short; upper leaves simple; stipules ovate, lanceolate, quite entire; stem a foot high, branched, diffused, round; flowers many together, purple. The whole plant pubescent, viscid.—It flowers in August, and is a native of the south of Europe.

13. Ononis Cernua; *Hanging-podded Rest-harrow*. Racemes strict; leaves wedge-form; legumes drooping, linear, recurved; branches round, purple, with whitish hairs scattered over them; flowers frequently single, from the side of the branches, large, of a bright yellow colour.—Native of the Cape.

14. Ononis Geminata; *Two-flowered Rest-harrow*. Leaves ternate, obovate; peduncles lateral, two-flowered.—Native of the Cape.

15. Ononis Umbellata; *Umbelled Rest-harrow*. Peduncles awnless, umbelled; leaves ternate, emarginate; stems prostrate.—Native of the Cape.

16. Ononis Argentea; *Silvery Rest-harrow*. Twining: peduncles awnless, umbelled; leaves ternate; leaflets sessile, silvery, tomentose.—Native of the Cape.

17. Ononis Involucrata; *Involucred Rest-harrow*. Hirsute, prostrate: peduncles awnless, involucred; involucre four-leaved; leaves ternate, wedge-form.—Native of the Cape.

18. Ononis Filiformis; *Thready-stalked Rest-harrow*. Peduncles awnless, subtriflorous; leaves ternate, subsessile; leaflets ovate, mucronate; root simple, descending; stems numerous, branched, hardish, filiform, diffused, a span high.—Native of the Cape.

19. Ononis Capensis; *Cape Rest-harrow*. Racemes on long peduncles; leaves ternate, suborbiculate, herbaceous, pubescent; corolla yellow and violet purple.—It is an annual plant.—Native of the Cape.

20. Ononis Prostrata; *Prostrate Rest-harrow*. Peduncles awnless, one-flowered, very long; leaves ternate, acute; stipules awl-shaped; stems prostrate.—Native of the Cape.

21. Ononis Reclinata; *Spreading Rest-harrow*. Peduncles awnless, one-flowered; leaves ternate, roundish, crenate; legumes drooping; corollas white, with the standard purple underneath. Annual.—Native of Spain and Italy.

22. Ononis Cenisia; *Narrow-leaved Trailing Rest-harrow*. Peduncles awnless, one-flowered; leaves tern-wedged; sti-

pules serrate; stems prostrate. The whole plant is sometimes covered with flowers, which are purple, and sometimes they are only at the ends of the branches.—Native of Italy, and of Dauphiny.

****With awned Peduncles.*

23. Ononis Vaginalis; *Sheathed Rest-harrow.* Peduncles one-flowered, awned; leaves sessile, ternate, and stipules sheathing, toothed. Viscid, villose, with a woody stem; corolla yellow, with a purple striated standard. At one time of the year it puts on so different an appearance, as to be easily taken for a distinct species; with the branchlets clustered, half an inch long; and the leaflets and stipules smaller, closely imbricate.

24. Ononis Cherleri; *Dwarf Rest-harrow.* Peduncles one-flowered, awned; leaves ternate, viscid and hairy; stipules serrate. Root woody; stem procumbent, diffused, wrapped in stipules every way; flowers axillary, their stalks erect, but nodding with the legume.—Native of the south of Europe.

25. Ononis Viscosa; *Clammy Rest-harrow.* Peduncles one-flowered, awned; leaves simple, the lowest ternate. Annual, with a strong, herbaceous, hairy stalk, a foot and half high, sending out branches the whole length.—Native of the south of France, Spain, and Portugal.

26. Ononis Ornithopodioides; *Bird's-foot Rest-harrow.* Peduncles two-flowered, awned; legumes linear, drooping; stem erect, flexuose, with short alternate branches. It flowers in July, and the seeds ripen in autumn.—Native of Sicily.

27. Ononis Pinguis; *Greasy Rest-harrow.* Peduncles one-flowered, awned; leaves ternate, lanceolate; stipules quite entire.—Native of the south of Europe.

28. Ononis Natrix; *Yellow-flowered Shrubby Rest-harrow.* Peduncles one-flowered, awned; leaves ternate, viscid; stipules quite entire; stem shrubby. This is a very strong smelling plant, with the odour of Theriaca, and not very clammy; root large and wrinkled; stems more or less upright, commonly a foot high; flowers large, yellow, solitary, the upper part rayed with red lines.—Native of the South of France, of Spain, Portugal, Carniola, and Switzerland. It is propagated by seeds, sown in thin drills, upon a bed of light earth. When the plants come up, keep them clean from weeds till autumn; then take them up carefully, and transplant them into the borders of the pleasure-garden, where they are to remain; the second year they will flower, and produce ripe seeds, but the roots will continue several years, and are very hardy.

*****Shrubby.*

29. Ononis Tridentata; *Three-tooth-leaved Rest-harrow.* Shrubby: leaves ternate, fleshy, sublinear, three-toothed; peduncles two-flowered; stem erect, panicled; flowers in terminal clusters, rose-coloured, on axillary jointed stalks.—Native of Spain and Portugal. This, with all the following species, may be propagated by seeds sown upon a bed of light earth in April. The plants will come up in May, when they must be kept clean from weeds; and if they be too close, some of them should be carefully drawn up in moist weather, and transplanted at four or five inches' distance; in the autumn they should be transplanted again, to the places where they are to remain. Those plants which were left growing in the bed where they were sown, must be treated in the same way. They will not thrive in pots, and do not flower till the second year, when they make a fine appearance during the continuance of their flowers. It will not thrive in the open air in England, unless it be planted in a warm situation; and in a very severe frost, covered to protect it. The seeds must be sown upon a well-sheltered border.

30. Ononis Crispa; *Curled-leaved Rest-harrow.* Shrubby: leaves ternate, waved, roundish, toothed, viscid, pubescent; peduncles one-flowered, awnless. Stem erect, panicled, pubescent, viscid; flowers lateral, axillary, solitary, on a very short peduncle; corolla yellow, the size of the leaves; with the standard streaked of a blood-red colour on the outside.—Native of Spain.

31. Ononis Hispanica; *Spanish Rest-harrow.* Shrubby: peduncles awned, one or two flowered; all the leaves ternate, channelled, recurved, serrate all along the edge; plant strict viscid, inodorous; flowers yellow, streaked with red.—Native of Spain.

32. Ononis Fruticosa; *Shrubby Rest-harrow.* Shrubby: leaves sessile, ternate, lanceolate, serrate; stipules sheathing; peduncles subtriflorous. This is a very beautiful low shrub, rising with slender stalks about two feet high, dividing into many branches. The flowers come out in panicles at the end of the branches upon long peduncles, which generally sustain three large purple flowers. It varies with white flowers. The flowers appear in May and June.—Found on hills and mountains in the south of France. This species will thrive very well in a shady border, and produce abundance of seeds. Mr. Curtis observes, that though it affects a dry and sandy situation, it is by no means nice as to soil or place, being hardy enough to survive a severe winter. In the collections near London, it is frequently found in pots, and kept with green-house plants. The best mode of raising it is from seed.

33. Ononis Rotundifolia; *Round-leaved Rest-harrow.* Shrubby: leaves ternate, ovate, toothed; calices three-leaved, bracted; peduncles subtriflorous; stem round, striated, somewhat villose, a foot and half or two feet in height. The flowers form handsome bunches at the ends of the branches, of a fine rose colour. The standard is very large, roundish, and pubescent.—It flowers from May to July, and is a native of Switzerland. It flowers in our open bordes, and ripens its seed, by which it is generally propagated. It may also be increased by slips, is very hardy, and easily cultivated. Its beauty has introduced it into our nurseries.

34. Ononis Microphylla; *Small-leaved Rest-harrow.* Shrubby, thorny: leaves minute, ternate, quite entire; legumes recurved. This shrub is very much branched, somewhat spreading, and armed with stout thorns.—Native of the Cape.

35. Ononis Mauritanica; *Barbary Rest-harrow.* Shrubby: leaves quinate, obovate, mucronate, silky underneath; stipules filiform; peduncles racemed.—Native of the Cape.

36. Ononis Subocculta. Flowers sessile; all the leaves ternate; leaflets orbiculate; stipules lanceolate, serrate; calices of the same length with the corolla. This species derives its specific name *Subocculta*, from the following singular peculiarity. In autumn the petals become so small, as to be concealed under the germen at the bottom of the calix, so as not to be seen; the fruit however is not on this account abortive. All parts of the flower are straight, distinct, not touching each other, but pale and flat, and seeming to be the commencement of a regular flower of four unequal petals. The flowers are more generally found in this state, than developed, coloured, and equal in length to the calix.—Native of Dauphiny and the county of Nice.

37. Ononis Strata. Stems prostrate; leaves ternate, smooth, striated; stipules ovate, acute, serrate; peduncles one-flowered; calices and legumes hirsute. Root perennial, hard, knobbed, tubercled, furnishing several creeping stems, commonly simple, from four to six inches in length, which have few leaves on their lower parts, and at top display a parcel of yellow flowers in a raceme.—Native of Dauphiny.

38. Ononis Decumbens. Leaves ternate, linear, lanceolate; stem decumbent; flowers in axillary spikes; legumes smooth. Perennial. The roots send forth several strong branches, which spread, and incline towards the ground. The flowers appear in loose panicles at the end of the branches; they are yellow, and are succeeded by smooth turgid pods, about half an inch long, each containing two or three kidney-shaped seeds. It flowers in July, and the seeds sometimes ripen here in the autumn.

Onopordum; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common roundish, ventricose, imbricate; scales numerous, spiny, prominent every way. *Corolla:* compound tubular, uniform; corollets hermaphrodite, equal; proper one-petalled, funnel-form; tube very slender; border upright, ventricose, five-cleft; segments equal, one more deeply serrated. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular, the length of the corolla, five-toothed. *Pistil:* germen ovate; style filiform, longer than the stamina; stigma crowned. *Pericarp:* none. *Calix:* slightly converging. *Seeds:* solitary; down capillary, sessile. *Receptacle:* chaffy; chaffs coadunate into the cells, truncate, mucronate, shorter than the seeds. Essential Character. *Scales:* mucronate. *Receptacle:* honeycombed.—Some of these plants were formerly cultivated for the table, but it was before the English gardens were well supplied with other esculent plants: at present they are rarely eaten here. They require no culture, and if the seeds are permitted to fall, they will come up fast enough.——The species are,

1. Onopordum Acanthium; *Woolly Onopordum*, or *Cotton Thistle.* Calices squarrose; scales spreading; leaves ovate, oblong, sinuated. In the first year this plant puts out many large downy leaves, sinuated on their edges, and very prickly; they spread on the ground, and continue the following winter. In the spring the stalk rises in the middle of the leaves, upon dunghills or good ground, growing five or six feet high, and dividing at top into many branches, which have leafy borders running along them, indented, and each indenture terminated by a spine. The stalks are terminated by scaly heads of purple flowers, appearing in June; to these succeed oblong angular seeds, crowned with a hairy down. This plant is distinguished from the Thistles by the receptacle reticulated with square membranous cells, like a honeycomb. When the flowering is over, the innermost scales of the calix close strongly together. In the Thistles, as soon as the seed is ripe, the first hot day opens the heads, extends the pappus, and the least wind carries away the seeds: but in this plant they remain shut up and strongly defended; nor can they commit themselves to the earth, or be eaten by birds, till long exposure to the weather has decayed the calix, and on this account they afford sustenance to the winged tribes late in the year. It is not very liable to the depredations of insects; and is defended by its strong spines from the attacks of most quadrupeds: the ass alone will sometimes browze upon it. The receptacle of the flowers, and the tender stalks peeled and boiled, may be eaten in the same manner as Artichokes and Cardoons.—The ancients thought this plant a specific in cancerous cases. Some of the moderns recommend its use externally in a cancer of the lips and face. Scopoli prescribes a decoction of the root as a specific in a recent gonorrhœa. It is good, as Hill observes, if used when fresh, for the jaundice, dropsy, suppressions of the menses, and other disorders arising from obstructions. Besides the name given above, it is called *Oat Thistle, Wild White Thistle, Argentine* or *Silver Thistle;* in Yorkshire, *Piy-leaves.*

2. Onopordum Illyricum; *Illyrian Onopordum.* Calices squarrose; lower scales hooked; leaves lanceolate, pinnatifid. This rises with a stalk six or seven feet high, branched from its base, broadly winged, and extremely spinous; the leaves are long and narrow, and the indentures on their sides are regular, ending in sharp spines. The heads of the flowers, which are purple, are larger, and the spines of the calix are longer, than those of the first sort.—Native of the south of Europe, and of Egypt, and the Levant.

3. Onopordum Deltoides; *Siberian Onopordum.* Calices squarrose, cobwebbed, tomentose underneath. Perennial; flowering in August. The leaves resemble those of Burdock.—Native of Siberia.

4. Onopordum Arabicum; *Arabian Onopordum.* Calices imbricated. This grows to the height of nine or ten feet and the stalks divide into many branches. Flowers solitary, erect, purple.—Native of the south of Europe.

5. Onopordum Græcum; *Grecian Onopordum.* Calices squarrose, cobwebbed-tomentose; leaves spiny, subulate-lanceolate, sinuate, tomentose; corollas purple, very narrow. —Native of the Levant.

6. Onopordum Acaulon; *Dwarf Onopordum.* Stemless: root biennial, fusiform, half a foot long, straight, black, and irregular on the outside; stem single, not more than two inches in height, erect, terminated by a sessile red and white flower.—Native of Greece: it flowers in July and August.

7. Onopordum Orientale; *Oriental Onopordum.* Calices squarrose; leaves oblong, pinnate-sinuate, decurrent; head large; stalk upright, branching, seven or eight feet high.—It grows naturally near Aleppo in Syria.

Onosma: a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted; segments lanceolate, erect, permanent. *Corolla:* one-petalled, bell-shaped; tube very short; border tubular-ventricose, a little thicker than the tube; mouth generally five-cleft; throat naked, pervious. *Stamina:* filamenta five, awl-shaped, very short; antheræ sagittate, erect, the length of the corolla. *Pistil:* germen four-parted; style filiform, the length of the corolla; stigma blunt. *Pericarp:* none. *Calix:* unchanged. *Seeds:* four, ovate. Essential Character. *Corolla:* bell-shaped, with the throat pervious. *Seeds:* four.—The plants of this genus being natives of walls or rocks, are best cultivated on a wall or rubbish. Sow the seeds soon after they are ripe, laying the stalks over the place to shade them from the sun. When the plants are well established, if they be permitted to scatter their seeds, they will maintain themselves very well. In the common ground they are short-lived, and apt to rot.——The species are,

1. Onosma Simplicissima; *Simple Onosma.* Leaves clustered, lanceolate, linear, hairy; flowering-top nodding, yellowish white; corolla constantly white. The wild plant is never more than a foot high, and soft to the touch.—Native of Siberia, abounding upon the calcareous rocks on the banks of the Wolga, flowering from April to June.

2. Onosma Orientalis; *Oriental Onosma.* Leaves lanceolate, hispid; fruits pendulous; flowers on stalks, yellow, in a terminal double cluster.—Native of the Levant.

3. Onosma Echioides; *Hairy Onosma.* Leaves lanceolate, hispid; fruits erect; root fusiform, with a bark peeling off in scales, which are as red as vermilion. It flowers from March to June.—Native of the south of Europe, Italy, France, Switzerland, Austria, and Hungary.

Opercularia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* common perianth, one-leafed, bell-shaped, three to six flowered, six to nine toothed; teeth acute, unequal, permanent; proper perianth,

none. *Corolla:* universal none; proper one-petalled, funnel-form; mouth four or five cleft, erect. *Stamina:* filamenta four, inserted into the receptacle; antheræ distinct. *Pistil:* germen inferior, immersed in the receptacle; style filiform; stigma thickish, bifid. *Pericarp:* none. *Seeds:* solitary, convex on one side, grooved on the other. *Receptacle:* common flat above, closing the aperture of the calix below the teeth; below pyramidal, grooved, angular; the angles continued into partitions, by which the cavity of the calix is divided into cells equal to the number of seeds; deciduous. ESSENTIAL CHARACTER. *Flower:* compound. *Calix: Common:* one-leafed, unequally toothed, closed by a common receptacle; flowering above; seeding below; falling when ripe.——The species are,

1. Opercularia Umbellata. Florets in the disk three; corollets three-toothed; pericarp none, unless the common calix of the flower be reckoned as such; it is bell-shaped, cut with seven or nine equal teeth; the seeds are inclosed within the cavity of it, equal in number to the corollets. Stem round, hairy, with opposite branches.—Native of New Holland.

2. Opercularia Aspera. Corollets four or six; border four or five parted; stamina four or five, inserted into the receptacle, not the corolla; antheræ separate. Stem upright, forked, round, smooth.—Native of New Zealand.

3. Opercularia Diphylla. Common calices hispid; heads as in the preceding, but little more than half the size.—Native of New Zealand.

Ophioglossum; a genus of the class Cryptogamia, order Filices.—GENERIC CHARACTER. *Capsules:* numerous, connected by a membrane into a distich spike, subglobular; when ripe opening transversely, without any elastic ring. *Seeds:* very many, extremely minute. *Observe.* The seventh species, and probably those species which are nearly allied to it, with a twining stem, recede in some degree from the common sort, and those which resemble it in the fructification.——The species are,

1. Ophioglossum Vulgatum; *Common Adder's Tongue.* Frond ovate, veinless, bearing the spike; root fibrous; stem single, round, very smooth, upright, simple, or unbranched, from a hand or a finger's length, to a span or more in height; terminated by a distich, jointed, tongue-shaped, greenish spike, brown when ripe; bearing one ovate leaf, an inch and half long. The spike consists of numerous capsules, full of minute chaffy seeds. The expressed juice of this plant is frequently made use of by country people, for internal wounds, bruises, and spitting of blood, with good success. The leaves bruised and boiled in a sufficient quantity of hog's lard, until they become crisp, and then strained, afford an excellent cooling ointment for green wounds, which is a very ancient recipe for that purpose.—Native of moist meadows and pastures in Europe, and of most parts of Great Britain, producing its spike in May.

2. Ophioglossum Nudicaule; *Naked Adder's Tongue.* Fronds ovate; scape leafless. This is a very small plant, not an inch high; root bundled, filiform; leaves few, radical, petioled, quite entire.—Native of the Cape.

3. Ophioglossum Lusitanicum; *Portuguese Adder's Tongue.* Frond lanceolate; herb annual, stemless, two inches high, erect; leaf single, petioled, acute, quite entire, smooth, the length three times as great as the breadth.—Native of Portugal, China, and Cochin-china.

4. Ophioglossum Reticulatum; *Netted Adder's Tongue.* Frond cordate. This plant generally rises to the height of five or six inches above the root.—Native of Jamaica, and the continent of South America.

5. Ophioglossum Palmatum; *Palmate-leaved Adder's Tongue.* Frond palmate, erect, two feet high, with the spike at the base. This is the largest of the species.—Native of South America.

6. Ophioglossum Pendulum; *Pendulous Adder's Tongue.* Fronds linear, very long, undivided. This is a parasite, hanging down from the branches of old trees.—Native of the East Indies.

7. Ophioglossum Scandens; *Climbing Adder's Tongue.* Stem flexuose, round; fronds conjugate, pinnate; leaflets spike-bearing on both sides. This rises to a considerable height on trees. It is found every where within the tropics.—Native of both Indies, China, and Cochin-china.

8. Ophioglossum Flexuosum; *Winding-stalked Adder's Tongue.* Scape flexuose, round; fronds opposite, petioled, palmate; pinnas lanceolate, quite entire, smooth. This is very nearly allied to the preceding; fronds remote on the stem, three or four lobed.—Native of the East Indies.

9. Ophioglossum Japonicum; *Japonese Adder's Tongue.* Stem flexuose, angular; fronds superdecompound; pinnules alternate, gashed.—Native of Japan.

Ophiorhiza; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, erect, compressed, five-toothed, equal, permanent. *Corolla:* one-petalled, funnel-form; tube inflated at the base; throat almost closed with hairs; border five-cleft, blunt, spreading. *Stamina:* filamenta five, filiform, very short, inserted into the tube; antheræ oblong, the length of the tube. *Pistil:* germen bifid, superior; style filiform, the length of the stamina, thicker above; stigmas two, blunt. *Pericarp:* capsule two-lobed, wide, bluntish; lobes oblong, divaricated, two-celled, opening inwards, with a contrary partition. *Seeds:* numerous, angular, fixed all round to an oblong stalked receptacle, loose in the middle of each cell. ESSENTIAL CHARACTER. *Corolla:* funnel-form. *Germen:* bifid. *Stigmas:* two. *Fruit:* two-lobed.——The species are,

1. Ophiorhiza Mungos. Leaves lanceolate-ovate; stem simple; flowers sessile from the upper side of the horizontal spike. The Ceylonese call this plant *Ekawerya*, and *Naghawalli*, from Nagha, the ribband-snake; for the bite of which, the leaves of this plant are accounted a specific.—Native of the East Indies.

2. Ophiorhiza Mitreola. Leaves ovate; roots from the lower joints of the stem, in bundles, long, filiform, white; stem herbaceous, a foot high, simple, or branched, erect, four-cornered at bottom, towards the upper part roundish, rather weak.—Native of America, in Virginia; and of wet meadows near rivers, in Jamaica.

3. Ophiorhiza Subumbellata. Stem shrubby; leaves lanceolate, acute; umbels axillary, trifid.—Native of the island of Otaheite, in the South Seas.

Ophioxylum; a genus of the class Polygamia, order Monœcia.—GENERIC CHARACTER. *Hermaphrodite flowers. Calix:* perianth five-cleft, acute, erect, very small. *Corolla:* one-petalled, funnel-form; tube long, filiform, thickened in the middle; border five-parted, spreading a little, without a nectary. *Stamina:* filamenta five, very short, in the middle of the tube; antheræ acuminate. *Pistil:* germen superior, roundish; style filiform, the length of the stamina; stigma capitate. *Pericarp:* berry twin, two-celled. *Seeds:* solitary, roundish. *Male flowers*, on the same plant. *Calix:* as in the hermaphrodites; Linneus and Gærtner say, bifid. *Corolla:* one-petalled, funnel-form; tube long; border five-cleft; nectary in the mouth of the corolla, cylindric, quite entire. *Stamina:* filamenta two, very short; antheræ acuminate, converging within the nectary. ESSENTIAL CHARACTER.

Hermaphrodite. Calix: five-cleft. *Corolla:* five-cleft, funnel-form. *Stamina:* five. *Pistil:* one. *Male. Calix:* bifid, *Corolla:* five-cleft, with a funnel-form mouth. *Nectary:* cylindric. *Stamina:* two.——The only species known is,

1. Ophioxylum Serpentinum; *Scarlet-flowered Ophioxylum.* Stem upright, round, quite simple; leaves in fours, placed crosswise, lanceolate, ovate, smooth, acuminate, petioled. Jussieu describes this shrub as having three or four leaves in whorls; flowers glomerate, terminating, white with a red tube; males mixed with the hermaphrodites, two-stamined only, with a cylindric entire crown at the throat of the tube, without any germen. It flowers in May.—Native of the East Indies.

Ophira: a genus of the closs Octandria, order Monogynia. —GENERIC CHARACTER. *Calix:* involucre two-valved, three-flowered; valves lateral, kidney-form, emarginate, conduplicate, permanent. *Corolla:* four-petalled, superior; petals oblong, converging. *Stamina:* filamenta eight, the length of the corolla; antheræ ovate. *Pistil;* germen inferior, turbinate, hispid; style filiform, shorter than the stamina; stigma emarginate. *Pericarp:* berry one-celled. *Seeds:* two. *Observe.* It bears much resemblance to the *Grubbia* of Bergius, which has a superior germen, and simple stigma. ESSENTIAL CHARACTER. *Involucre:* two-valved, three-flowered. *Corolla:* four-petalled, superior. *Berry:* one-celled.——The only species known is,

1. Ophira Stricta. This is an upright shrub, with opposite ovate-linear leaves, and lateral sessile flowers.—Found by Burmann in Africa.

Ophrys; a genus of the class Gynandria, order Diandria. —GENERIC CHARACTER. *Calix:* spathes wandering; spadix simple; perianth none. *Corolla;* petals five, oblong, converging upwards, equal, two of these exterior; nectary longer than the petals, hanging down posteriorly, one somewhat keeled. *Stamina:* filamenta two, very short, placed on the pistils; antheræ erect, covered with the inner margin of the nectary. *Pistil:* germen oblong, contorted, inferior; style fastened to the inner margin of the nectary; stigma obsolete. *Pericarp:* capsule subovate, three-cornered, blunt, striated, three-valved, one-celled, opening at the keeled angles. *Seeds:* numerous, like saw-dust; receptacle linear, fastened to each valve of the pericarp. *Observe.* The second species has four stamina, or two in each cell. Some modern writers have very unadvisedly cancelled the whole class Gynandria, and removed this natural order into the class Diandria. ESSENTIAL CHARACTER. *Nectary:* somewhat keeled underneath.——The species are,

* *With branched Bulbs.*

1. Ophrys Nidus Avis; *Bird's-nest Ophrys.* Bulbs in bundles of fibres; stem sheathed, leafless; lip of the nectary bifid. The name is derived from the matting and twisting of the fibrous roots; from which arise two oval veined leaves, three inches long, and two broad, joined at their base; between these springs up a naked stalk, about eight inches high, terminated by a loose spike of herbaceous flowers, resembling gnats, composed of five petals, with a long bifid lip to the nectarium, a crest or standard above, and two wings on the side; capsule angular, opening in six parts, and filled with small seeds like dust.—Native of various parts of Europe. In England, it is found about Charlton, Gravesend, Maidstone, and Rochill, in Kent; Selborne, in Hampshire; Madingly wood, in Cambridgeshire; Aldborough, in Suffolk; and Heydon, in Norfolk; near Ingleton; and in Offley park, in Yorkshire; Buckham wood, in Cumberland; and near Kendal, in Westmoreland; not uncommon about Newton Cartmel; where it was found by Mr. Hall, who observes, that the woods in that part of Lancashire are cut down every fifteen years; that for six or eight years after they are cut, this plant is not to be found, but as soon as the grasses are nearly destroyed by the shade, it appears again, and in some places is tolerably plentiful. Mr. Blackstone observed it in White-heath wood, by Harefield. It is also found in some woods of Scotland, but is not common. This plant refuses culture, but may be transplanted from the places where it grows naturally, into a shady part of the garden, where, if the roots are not disturbed, it will continue many years, and flower, but not increase. The best time to remove the roots is in July, or August, when the leaves are decaying; for it will be difficult to find the roots after the leaves are gone. It flowers in May and June.

2. Ophrys Corallorhiza; *Coral-rooted Ophrys.* Bulbs branched, flexuose: stem sheathed, leafless; lip of the nectary trifid. The roots consist of six white succulent obtuse fibres, branched like coral.—Native of the northern parts of Europe; also of Switzerland, Carniola, and the south of France. In Britain it is found sparingly, in fir woods, in the north of Scotland. It flowers in August and September; and must be treated like the preceding species.

3. Ophrys Spiralis; *Spiral Ophyrs,* or *Triple Ladies' Traces.* Bulbs aggregate, oblong; stem somewhat leafy; flowers in a spiral, directed one way; lip of the nectary undivided, crenulate; root-leaves four or more, forming a tuft, ovate, lanceolate, smooth, entire at the margins, bright green, half an inch in breadth, dotted when magnified, and faintly ribbed. It is found in many parts of France, Germany, Austria, Switzerland, Italy, and England; flowering from August to October. It may be met with, on Hanwell Heath, near Isleworth; and on Enfield Chase, in Middlesex; Barn Elms, in Surry; Dartford, in Kent; on the Hill of Health, between Cambridge and Madingly; and by Hinton, and Feversham Moors, in Cambridgeshire; on the south side of Shotover Hill, in Oxfordshire; on the Fen, in Little Marlow, Buckinghamshire; Warckton, in Northamptonshire; in the closes near Buddon wood, Leicestershire; at East Leke, in Nottinghamshire; near Leeds, in Yorkshire; in the lime-stone pastures about Newton Cartmel; and is not uncommon in the northern counties; on the road from Truro to Redruth, in Cornwall; under the rocks at Pinney Cliffs, near Lyme. It grows in pastures, both dry and moist; not only in a calcareous soil, but in dry sand, barren clay, elevated pastures, rocky sunny exposures, good soil, boggy commons, &c.; and is not so much rare, as overlooked. Mr. Curtis remarked, that it grows more readily than its congeners in a garden, and that the protuberant germina, placed regularly one above another, somewhat resemble plaited hair, whence perhaps its name of *Ladies' Traces,* or, if this conjecture be correct, *Ladies' Tresses.* It will grow in almost any soil or situation.

4. Ophrys Cernua; *Nodding Ophrys.* Bulbs in bundles; stem leafy; flowers drooping; lip of the nectary oblong, entire, acute; the root consists of very many thick fibres; root-leaves linear, long; stem-leaves sheathing, very short; spike dense, oblong; flowers closely recurved, drooping.—Native of Virginia, and Canada.

5. Ophrys Ovata; *Common Ophrys,* or *Twayblade.* Bulbs fibrous; stem two-leaved; leaves ovate; lip of the nectary bifid; root perennial; flowers numerous, in a loose spike, four inches long or more, yellowish green. They have a fragrant musky scent; and are on pedicels, longer than the germina or bractes.—Native of most parts of Europe, and common all over Great Britain, where it has long been called Twayblade, from its two leaves, although it sometimes varies with three. A strong infusion of the fresh root is good against the bleeding of the piles, and the expressed juice is recommended to

be outwardly applied to the same purpose. It flowers in May and June: as it grows naturally in woods, and thickets, the shady part of any garden, especially in a moist soil, will be a proper place to plant it.

6. Ophrys Cordata; *Mountain Ophrys*, or *Least Twayblade*. Bulb fibrous; stem two-leaved; leaves cordate. They grow above the middle of the stem, being between heart-shaped and triangular, broad, terminating in a small projecting point; flowers few, in a short spike. Lightfoot remarks, that the whole plant is of a tender and delicate texture; the leaves smooth, about half an inch wide at the base; the flowers in a thin spike ten or twelve in number, green, often turning red in decay.—Native of the northern parts of Europe, in moist woods. In England it is found in boggy ground, in Yorkshire, Lancashire, and Westmoreland: as on Ingleborough; between Sheffield and Chatsworth, Almondborough, and Kighley, in Yorkshire; Kendal and Longsledale, in Westmoreland; in marshy places by the sides of rivulets; and in many places on the Highland mountains of Scotland. It flowers in June and July.

** *With round Bulbs.*

7. Ophrys Lilifolia; *Lily-leaved Ophrys*. Bulb roundish; scape naked; leaves lanceolate; lip of the nectary entire; dorsal petals linear; flowers red.—Native of the swamps of Virginia and Canada. This and the two following species require to be planted in bog-earth, in a moist shady border, or in pots with bog-moss and earth, set in pans of water.

8. Ophrys Loeselii; *Dwarf Ophrys*, or *Twayblade*. Bulb roundish; scape naked, three-cornered; lip of the nectary obovate; flowers herbaceous, from three or five to eleven.—Native of Denmark, Sweden, Prussia; and found in England, on Hinton, Feversham, and Fulbourn moors, near Cambridge.

9. Ophrys Paludosa; *Marsh Ophrys*, or *Twayblade*. Bulb roundish; scape almost naked, five-cornered; leaves rugged at the top; lip of the nectary entire; flowers in a raceme, very many, yellowish green; the two side-petals ovate oblong, from reflex erect, the two inner lateral ones linear, recurved, the single upper one straight, forming the arch for the stamina; lip of the nectary lanceolate, ovate, reflex, entire.—Native of bogs, in Sweden, Russia, Germany, and Great Britain. Found between Hatfield and St. Alban's, and in Romney marsh; also on Gamlingay bogs, where it grows in great plenty among the Sphagnum; at Hurst Hill, Tunbridge Wells; in Hallinghall wood, near Loughborough; Buddon wood, and Stocking wood, near Leicester; on Cawstone and Felthorp heaths, in Norfolk; and between Russland Chapel and Thwaite Moss, in Furness Fells, Cumberland. It flowers in June and July.

10. Ophrys Monophyllos; *One-leafed Ophrys*. Bulb round; scape naked; leaf ovate; lip of the nectary entire; culm eighteen inches high, firm, simple; stipules very small, sharply lanceolate.—Native of Russia and Switzerland.

11. Ophrys Alata. Bulb round; stem leafy; leaves lanceolate; lip trifid, the middle segment very short.—Native of the Cape.

12. Ophrys Muscifera; *Fly Ophrys*. Bulbs roundish; stem leafy; lip of the nectary convex, with three divisions, the middle segment cloven; leaves three or four, sheathing the stem at the base, lanceolate, pale green, smooth, shining, marked with numerous longitudinal nerves, the intermediate space covered with a thin, somewhat pellucid, puckered skin, giving them a silvery hue; flowers in a long thinly scattered spike, sometimes fifteen in number, but seldom more than four or five; the three outer petals linear, with reflexed margins, the upper one forming right angles with the others; the two inner thread-shaped, spreading, resembling the antennæ of an insect, deep reddish brown, fringed with short hairs, fixed to the upper lip of the nectarium, which is hooded, covering the stamina; lower lip three-lobed; side-lobes linear, entire; middle somewhat ovate, bifid, with reflex margins, covered with a velvety down, reddish brown, and with a bluish spot on the centre, which is naked. The whole extremity resembles a fly, to which this blue spot greatly contributes. There are several varieties; as the Fly-shaped, the Great Fly, the large Green Fly, the Blue Fly, and the Yellow Fly Ophrys.—Native of Sweden, Norway, Switzerland, Austria, Carniola, France, Italy, and Great Britain; where it is found about Wrotben and Northfleet in Kent; Harefield in Middlesex; Croydon in Surry; Hinton, Feversham, Fulbourn, Linton, the Devil's Ditch, and Chippenham, in Cambridgeshire; Bath Hills near Bungay; and Eastham wood in Suffolk; on St. Vincent's Rocks near Bristol; in Plumpton woods near Ulverstone; at Rushton in Northamptonshire: at Aspley in Nottinghamshire; in Barrowfield wood and Brigstear moss, Westmoreland; and in most calcareous pastures. It flowers in May and June.—This, with the thirteenth, fourteenth, fifteenth, and eighteenth species, may be preserved in gardens, though not propagated there. The best time to remove the roots from the places where they naturally grow, is just before the stalks fall, for at that time they may be easily discovered, and are beginning to rest, so that the bulb will be fully formed for flowering the following year, and will not shrink; but when they are removed at the time when they are in action, the bulb designed for flowering the following year, not being fully ripened, will shrink, and frequently perish. The roots should be taken up with large balls of earth round them, and be planted again as soon as possible. When they are removed into a garden, they should be so placed as that the soil and situations may be as nearly as possible similar to those from which they were taken. Such as grow in moist pastures, should be planted in shady moist borders; those which are inhabitants of woods, may be planted under trees; but such as grow upon chalk hills, should have a bed of chalk prepared for them in an open situation; and when they are fixed in their several places they should not be disturbed; for provided they are kept clean from weeds, the less the ground is disturbed, the better the plants will thrive, and the longer they will continue. Mr. Curtis observes, that he has not yet heard of these plants being propagated by seed, and that it is to be wished that some intelligent gardener would exert himself in making experiments to raise them in this way.

13. Ophrys Apifera; *Bee Ophrys*. Bulbs roundish; stem leafy; lip of the nectary three-lobed, the lobes bent in underneath, shorter than the petals. Haller has mistaken this for the preceding species. Height of the stalk, from half a foot to a foot; the leaves ovate-lanceolate, underneath silvery, with linear fibres, frequently imperfect, and of a brown colour; bractes large, sheathing, green, and of equal length with the flowers, which are from three to six. The root appears to possess the same virtues with those of the Orchis whence *Salep* is made, but being much smaller, is not worth cultivating on that account. This singularly beautiful plant is not uncommon on our calcareous soils, near woods, and in meadows. It can scarcely be found at all in the vicinity of London, owing to the rapacity of florists, who root up all that can be found for sale. It has been found near Charlton Church, and Chisselhurst in Kent, a well as on Trunhill downs in the same county; about Harefield in Middlesex; in Madingley wood; at Hinton, Feversham, Fulbourn, Burrough green, Chippenham, and Linton, in Cambridgeshire:

at Bolnhurst in Bedfordshire; at Bradenham in Buckinghamshire; at Blatherwick and Asply in Northamptonshire; at Pently Hangings in Oxfordshire; about Earsham and Mulbarton in Suffolk; on St. Vincent's Rocks near Bristol; near Carisbrook Castle in the Isle of Wight; and at Great Comberton towards Woller's Hill; and at Tedestone near Whitbourne in Worcestershire. It flowers in June and July, and ripens seed in the end of August. See the twelfth species.

14. Ophrys Aranifera; *Spider Ophrys.* Bulbs roundish; stem leafy; lip of the nectary roundish, entire, emarginate, convex, longer than the petals; leaves next the root an inch and half long, almost an inch broad, ovate-lanceolate, somewhat blunt, marked with impressed lines, smooth, spreading on the ground, those of the stalk few, narrower, and more pointed; flowers from three to six, in a thin spike. The nectary, which at first is of a bright aad very rich brown colour, soon changes to a faded yellow green; when the flowering is past, the petals incline forward close over the nectary. The flower is not so beautiful as that of the two preceding species: it is fancied by some to resemble a bee, by others a spider; from the breadth of the lip, and its being marked with different shades of brown, it derives its resemblance to the latter; others have discovered a likeness to a small bird in the flower.—It is a native of England, in chalky pastures; as about Northfleet, Bocton church-yard, and other places, in Kent; Heatherhead in Surry; near Wheatley, between Whitney and Burford; Caversham warren and Stansfield in Oxfordshire; about Branham near Tadcaster in Yorkshire; about Bury in Suffolk; at Shelford, Abington, Hildersham, and Bartlow, in Cambridgeshire. With a little attention and management, this plant will grow and flower more freely than many of the same tribe. The following treatment has succeeded. Take up the roots carefully when in flower, bare them no more than is necessary to remove the roots of other plants; fill a large-sized garden pot with three parts choice loam moderately stiff, and one part chalk mixed well together, and passed through a sieve somewhat finer than a common cinder sieve: in this mixture place your roots at about the depth of two inches and three inches apart, water them occasionally during summer, if the weather prove dry: at the approach of winter, place the pot in a frame under a glass, to keep it from wet and frost, which combined destroy the beauty of the foliage, if not the plant itself. Observe: this species emerges in the autumn before any of the others make their appearance.

15. Ophrys Monorchis; *Yellow*, or *Musk Ophrys.* Bulb globular; scape naked; lip of the nectary trifid, cross-shaped; stem about six inches high, round, and smooth; root-leaves two or three, sheathing the stem, lanceolate, acute, smooth. The flowers are greenish yellow, with a faint musky smell. They appear in July.—Native of Sweden, Denmark, Germany, Switzerland, Austria, Prussia, Italy, and England; where it is found near Enfield in Middlesex; at the chalk pits near Gogmagog hills in Cambridgeshire; and at Marham near Swaftham, and near Snettisham, in Norfolk. See the twelfth species.

16. Ophrys Alpina; *Alpine Ophrys.* Bulbs ovate; scape naked; leaves awl-shaped; lip of the nectary undivided, blunt, one-toothed on each side.—Native of the mountains of Lapland, Denmark, Switzerland, Dauphiny, Piedmont, Carniola, Austria, &c.

17. Ophrys Camtschatea; *Siberian Ophrys.* Scape filiform, sheathed; raceme close; lip of the nectary linear, bifid.—Native of Siberia.

18. Ophrys Anthropophora; *Man Ophrys.* Bulbs roundish; stem leafy; lip of the nectary linear, three-parted, the middle segment elongated, bifid; root-leaves four or five, sheathing the stem at the base, lanceolate, but varying in breadth, spreading; above these, one or two more closely embracing the stem; flowers numerous, in a long loose spike. It varies in size; and in the colour of its flowers, from yellow green to bright ferruginous. The root, and indeed the whole plant, emits a strong odour.—Native of the southern parts of Europe, and of England, where it is principally found in dry pastures and old chalk-pits; as, near Northfleet, Greenhithe; between Gravesend and Cliffe; at Dartford; in Bocton church-yard; in the way to Branley; and at Truhill, &c. in Kent; about Croydon and Leatherhead in Surry; near Linton in Cambridgeshire; at Kimbolton in Huntingdonshire; at Dalington near Sudbury in Suffolk; and at Ashwelthrope near Norwich. It flowers in June. See the twelfth species.

19. Ophrys Crucigera. Bulbs roundish; stem leafy; lip of the nectary undivided, marked with a convex cross.—Suspected to be a variety of the thirteenth species.

20. Ophrys Volucris. Bulbs roundish; leaves oblong, sheathing the stem; lip cut out ovate; stem a foot high.—Native of the Cape.

21. Ophrys Bracteata. Bulbs roundish; spikes mixed with longer bractes; lip three-lobed; stem a span high.—Native of the Cape.

22. Ophrys Atrata. Leaves linear, setaceous; lip cordate, spatulate; stem simple, a hand high; spike terminating; flowers sessile, remote, under each a bristle-shaped bracte, the length of the flower. The whole plant turns black in drying.—Native of the Cape.

23. Ophrys Catholica. Bulbs fibrous; flowers three-petalled; helmet ventricose, large; lip cross-shaped; stem leafy; leaves three, alternate, embracing, lanceolate; the root-leaves shorter; raceme four or five flowered; bracte the length of the corolla; helmet one-leafed.—Native of the Cape.

24. Ophrys Circumflexa. Bulbs undivided; flowers three-petalled; wings emarginate; lip trifid, the lateral segments bent round; leaves lanceolate; spikes five-flowered or thereabouts, with ventricose bractes.—Native of the Cape.

25. Ophrys Caffra. Stem three-leaved; lip bifid; flowers in a raceme, three or four, yellow.—Native of the Cape.

26. Ophrys Bivalvata. Flowers in bundles; lip lanceolate; stem a span or a foot high; spike corymbed, without a distinct peduncle; germen streaked.

27. Ophrys Alaris. Lip of the nectary entire, waved; stem a span high or more; stem-leaves three, the first obsolete, the second oval, lanceolate, the third spatheform; spike few-flowered, with ovate acute bractes.—Native of the Cape.

28. Ophrys Patens. Leaves awl-shaped; lip of the nectary very short, capillary; stem hardly a hand high, longitudinally imbricated with leaves; root-leaves short, linear; flowers two to four, rather large.—Native of the Cape.

29. Ophrys Nervosa. Stem naked, angular; leaves ovate, nerved; lip of the nectary entire, reflex; flowers at the top of the scape elongated in a spike, alternate, drooping, purple; spike sharply angular, erect, smooth, about a span in length; corolla three-petalled. Under each flower a very short, ovate, purple bracte.—Native of Japan.

30. Ophrys Triphylla. Stem three-leaved; lip triangular, toothed at the base.—Native of the Cape.

31. Ophrys Inversa. Leaves ensiform; lip bifid, entire.—Native of the Cape.

32. Ophrys Bicolor. Leaves linear, ensiform; lip cut out bifid.—Native of the Cape.

33. Ophrys Squamata. Bulbs bundled; scape elongated,

leafless, spiked; root-leaves imbricate, oblong, acute, keeled; lip of the nectary trifid, bearded, bent down.—Native of New Caledonia.

34. Ophrys Unifolia. Bulb ovate; scape round, sheathed; leaf round, fistular, reflex, perforated in the middle to let the scape pass.—Native of New Zealand.

Opobalsamum. See *Amyris.*

Opuntia. See *Cactus.*

Orache. See *Atriplex.*

Orange. See *Citrus.*

Orchard.—In planting an orchard, great attention should be paid to the nature of the soil; and such sorts of fruits only should be chosen, as are best adapted to the ground designed for planting; otherwise there can be little hopes of their succeeding: and it is for want of rightly observing this method, that we see in many places orchards planted which never arrive to any tolerable degree of perfection, the trees starving, and their trunks either covered with moss, or the bark cracked and divided, both which are evident signs of the weakness of the trees; whereas if perhaps instead of Apples, the orchard had been planted with Pears, Cherries, or any other sort of fruit adapted to the soil, the trees would have grown very well, and produced fruit in abundance. As to the position of an orchard; where you are at full liberty to choose, a rising ground open to the south-east is to be preferred; but by no means plant upon the side of any hill where the declivity is very great; for in such places the great rains commonly wash down the better part of the ground, which deprives the trees of their necessary support: but where the rise is gentle, it is advantageous to the trees, by admitting the sun and air between them more effectually than can be done upon an entire level; which is exceedingly advantageous for the fruit, by dissipating fogs, and drying up the damp, which when detained amongst the trees, mix with the air, and render it rancid. If the ground be defended from the west, north, and east winds, it will also render the situation still more advantageous, for it is chiefly from those quarters that fruit-trees receive the greatest injury; therefore if the place be not naturally defended from these by rising hills, which is always to be preferred, let large-growing timber-trees be planted for that purpose at some distance from the orchard. A great regard should also be had to the distance of planting the trees, which is what few persons properly consider. Planting them too close exposes them to blights; and will cause the fruit to be ill-tasted, by confining the air, when laden with a great quantity of damp vapours arising from the perspiration of the trees and exhalations from the earth, which being imbibed by the fruit, render their juices crude and unwholesome. To prevent this, plant the trees fourscore feet asunder, but not in regular rows. The ground between the trees they plough and sow with wheat and other crops, in the same manner as if it were clear from trees, (and the crop is found to be as good as those quite exposed, except just under each tree,) until they are grown large, and afford a great shade; while the trees, by the ploughing and tilling of the ground, are rendered more vigorous and healthy, scarcely ever exhibiting any moss, or other marks of poverty, and will abide much longer, and produce much better fruit. If the ground selected for an orchard, have been a pasture for some years, plough it in the green sward the spring before you plant the trees, and let it lie a summer fallow; which will greatly improve it, provided it be stirred two or three times, to rot the sward of grass, and prevent weeds growing. At Michaelmas plough it rather deeply, in order to loosen it for the roots of the trees, which should be planted in October, if the soil be dry; but if moist, it will be better to defer it till the beginning of March. Their distance apart, even in a close orchard, must never be less than forty feet; and they will succeed better, if placed eighty feet asunder. When you have finished planting the trees, provide some stakes, to support them, and prevent their being blown out of the ground, especially if it should happen after they have been planted some time; for the ground in the autumn being warm, and for the most part moist, the trees will very soon push out a great number of young fibres, which, if broken off by their being displaced, will greatly retard the growth of the trees. In the spring following, if the season should prove dry, you should cut a quantity of green sward, which must be laid upon the surface of the ground about their roots, turning the grass downward, which will prevent the sun and wind from drying the ground, whereby a great expense of watering will be saved; and after the first year they will be out of danger, if they have taken well. In ploughing the ground between the trees, be careful not to go too deeply among their roots, lest you should cut them off, which would greatly damage the trees; but when the ground is cautiously stirred, the effect will be very beneficial. It is a good rule never to sow too near the trees, nor to suffer any great-rooting weeds to grow about them, which starve their roots by exhausting the soil. If, after the turf which was laid round the trees be rotted, you dig it in gently about the roots, it will greatly encourage them. There are some persons who plant many sorts of fruit together in the same orchard, mixing the trees alternately; but this is a method which should always be avoided, for it occasions a greater difference in the growth of the trees, and not only renders them unsightly, but also the fruit upon the lower trees ill-tasted, by the tall ones overshadowing them: so that whoever is determined to plant several sorts of fruit upon the same spot, should observe to place the largest-growing trees backward, and so proceed to those of the next least growth, continuing the same method quite through the whole plantation; whereby it will appear at a distance in a regular slope, and the sun and air will more equally pass through the whole orchard, affording equal benefit to every tree; though it must be admitted that this can only be practised upon good ground, in which most sorts of fruit trees will thrive. The orchard should be dunged or manured every two or three years; which is equally necessary for every crop raised from among the trees: so that where persons are not inclinable to improve their orchards, on account of the expense of manure, the crop expected from the ground, in addition to the fruit yielded by the trees, will more readily induce them to incur that expense. In choosing trees for an orchard, always observe to procure them from a soil nearly akin to that where they are to be planted, or rather poorer; for if you procure them from a very rich soil, and plant them in indifferent land, they will not thrive well, especially for four or five years after planting; so that, as we have shown under the article *Nursery*, it is a a very wrong thing to raise young trees in a very rich soil, and afterwards to transplant them into a very poor soil. The trees should be young and thriving; for, whatever some persons may advise to the contrary, it has always been observed, that though large trees may grow and produce fruit after being removed, they never make so good trees, nor are so long-lived, as those which are planted while young. After the trees are planted out, they will require no other pruning, except cutting out dead branches, and lopping off those that cross each other, and render the heads of the trees confused and unsightly: the pruning them too often, and the shortening their branches, is very injurious; espe-

cially to Cherries and stone-fruit, which will gum prodigiously, and decay in places where they are cut; while the Apples and Pears, which are not of so nice a nature, will produce a greater quantity of lateral branches, which will fill the heads of the trees with weak shoots, whenever their branches are thus shortened; which often occasions the casting off of the fruit produced at the extremity of their shoots. It may seem strange to some persons, says the celebrated Mr. Miller, that I should recommend the allowing so much distance to the trees in an orchard, because a small piece of ground will admit of but very few trees, planted in this method; but, if they will please to observe, when the trees are grown up, they will produce a great deal more fruit than twice the number when planted close, and their fruit will also be better tasted. The trees planted at a great distance, are never so liable to be blighted, as has been observed in Herefordshire; where they find, when orchards are so planted or situated, that the air is pent up amongst the trees, and the vapours that arise from the ground, and the perspiration of the trees, collect the heat of the sun, and reflect it in streams, so as to cause what they call a fire-blast; which is the most injurious to their fruits, and is most frequent where the orchards are open to the south sun. But as orchards should never be planted, except where large quantities of fruit are desired, so it will be the same thing to allow twice or three times the quantity of ground; since, as has been already observed, there may be a crop of any sort of grain upon the same place, so that there is no considerable loss of ground; and for a family only, it is hardly worth while to plant an orchard, since a kitchen garden well planted with espaliers, will afford more fruit than can be eaten while good, especially if the kitchen-garden be proportioned to the size of the family. Even if cider be required, there may be a large avenue of Apple-trees extended across a neighbouring field, which would render the path pleasant; or, there may be some single rows of trees planted, to surround fields, which will effectually answer the same purpose, without being liable to the fire-blasts beforementioned. Those small pieces of ground adjoining to houses, and that are called orchards because they are stuck full of fruit-trees, without much regard to soil or aspect, seem to have only one advantage, that the proprietor is at hand to protect the fruit from plunderers. But the orchards in the cider counties, and particularly in Herefordshire, are dispersed over all parts of the country, at various degrees of elevation, and in aspects that look to every point of the compass; although the south-east, with a screen to the north, seems to be the favourite aspect. But though this has reason on its side, wherever the fruit plantations are extensive, it is prudent to place them with different aspects; for, as Mr. Marshall has observed, in the year 1783, orchard fruit was cut off in every aspect, except the north-west. This was probably owing to the blossoms being kept back, till frost and blight were past; but there can be little doubt that on ground gently inclining to the south, or south-east, and well defended to the north and east, there will be in general a greater probability of a crop, and the fruit will be better flavoured. The richest soil is commonly in valleys, and they are there more sheltered from storms; but they are also more subject to spring frosts, insects, and blights. The best orchards of Apples are on a strong clayey soil, which is congenial to most varieties of this fruit; some of them however affect a light sandy loam, as the Stire, Hagloe Crab, and Golden Pippin; and it is a fact, well ascertained, that cuttings from the same tree, and grafted upon similar stocks, will produce cider of a different quality, when planted in different soils. It seems to be admitted, that the liquor produced from trees in clay, is of a stronger body, and will keep better, than that which is made from trees on a sandy soil. Pears are less difficult in their soil than apples, and they are not so liable to be injured by frost and blight. They are generally supposed to flourish most in a calcareous soil; though the Squash Pear draws the finest Perry from deep strong land. Stocks for grafting upon are raised either in November or February. The must, or residue of Apples or Crabs after the cider or vinegar has been squeezed out, is sown on a bed of highly cultivated mould in a garden, and is kept clean by hand. If new varieties, or the improvement of old ones, be the object, the seed-bed ought to be made as rich as possible; but if the preservation of varieties be all that is wanted, a common loamy soil is sufficient. It must however be remarked, that this method of sowing the must is a bad one, because the largest and best kernels are bruised in the press; and thus the stocks are mostly raised from the smaller ones. It would surely be better to pick a few of the best Apples from the tree, or rather to let them remain till they are so ripe as to drop off themselves, and then to take out the soundest and healthiest kernels. Stocks raised from apple kernels are, however, much inferior to such as are raised from the crab. The tree will bear fruit three or four years sooner; but the crab stock will endure twenty or thirty years longer, and is not so liable to moss and canker. At the end of two years, the seedlings are planted out in a nursery, in rows, three feet distant, and from fifteen to eighteen inches, or even two feet asunder in the rows; care being had not to cramp the roots, but to bed them evenly in the mould. The plants should be sorted according to their strength, the tap-roots taken off, and the longer side rootlets shortened: whilst they remain in the nursery, which they generally do till they are finally planted out in the orchard, they are trimmed twice a year. It is a good method to transplant them two years before they are to be transferred to the orchard, into fresh unmanured ground, double dug, and set in a quincunx order, four feet apart every way. For raising and improving varieties, the soil should be deep and good; and the plants should be moved every second, third, or fourth year; but all this trouble is very seldom taken. While the plants are small, the intervals may be cropped with such kitchen-garden produce as will not overshadow them, or exhaust the ground. In trimming or pruning, if there be two leaders, the weaker should be taken off; if the leader be irrecoverably lost, cut the plant down, to within a handsbreadth of the soil, and train a fresh stem; take the undermost boughs off by degrees, always preserving sufficient heads to draw up the sap; not trimming them up to naked twigs, as is the common practice, thereby drawing them up tall and feeble. The length of stem to which stocks are usually trained is six feet, or sometimes near seven; if they were still higher, they would be more out of the reach of stock, and be much less injurious to whatever grows under it. The usual size at which stocks of the common height are planted out, is four to six inches girth, at three feet high; to which size they will attain in seven or eight years, with proper management. In planting the orchard, the proper distance ought to be proportionable to the natural growth, or spread of the trees; in old orchards, the trees are only eight or even six yards asunder, and the more prevailing distance has since been ten yards, though some allow twelve yards, which is still better, but yet not enough; for in the grass grounds of Gloucestershire, and the arable fields of Herefordshire, twenty yards is a common distance; some of twenty-five yards, so that a chain's length, or twenty-two yards, might be taken as a good medium distance, and in this case each acre would hold forty trees. In grounds, the

trees should be in lines, for the convenience of ploughing; in close orchards, they should be set in the quincunx manner. The time of planting is October and November, or February, March, and April. Where the soil is dry and light, autumn is preferable; but in a cold wet situation and tenacious soil, the spring months are best. The leader should now be shortened, and the smaller side-boughs be taken off, leaving a proper choice of the larger side-boughs entire and untouched, to draw up the sap, and to furnish wood proper for grafting. The common method of planting is to dig a hole, wide enough to receive the roots, which being placed within it, the mould is returned upon them, in the order in which it came out, carefully replacing the sods on the surface, that no grazing ground may be lost. A better method is this: the ground being set out with stakes, driven in at the centres of the intended holes, describe a circle, five or six feet in diameter, round each stake; if the ground be in grass, remove the sward in shallow spits, placing it on one side of the hole; put the best of the loose mould by itself on another side, and the dead earth in a third heap: where the subsoil is cold and retentive, the holes should not be made much deeper than the cultivated soil; in a dry light soil, the holes should be made deeper, both to obtain a degree of coolness and moisture, and to establish the plants firmly in the ground. In soils of a middle quality, the hole should be of such a depth, that when the sods are thrown to the bottom of it, the plant will stand at the same depth in the orchard as it did in the nursery. The holes ought to be made previous to the day of planting; and if the ground and weather be dry, the holes should have two or three pails full of water thrown into each, the evening before. In planting, the sods should be thrown to the bottom of the hole, chopt with the spade, and covered with some of the finest of the mould: if with this the bottom be not raised high enough for the plant, return some of the worst mould before the sods are put in. Upon the fine mould spread the lowest tier of roots, drawing them out horizontally with all their fibres, pressing them evenly into the soil, and covering them by hand with some of the finest of the mould; one person steadying the plant, another adjusting and bedding the roots, and a third supplying the mould; which being raised high enough to receive another tier of roots, they are to be spread and bedded like the former: thus proceeding till the roots are all bedded freely, yet firmly, among the best of the soil. When they are covered some depth, press the earth in well with the foot, and raise the remainder into a hillock round the stem, to afford coolness, moisture, and stability to the plant. It is a common fault to plant fruit-trees too deeply in the ground; though, provided they can withstand the violence of the wind, they can scarcely be planted too near the surface. Young trees are frequently planted in hop grounds, and therefore want no protection; the land not being converted either into arable or pasture, till the trees are out of the reach of cattle: but when they are planted in pasture land, or open fields, tall thorns, fastened by withes, are commonly placed round them; this however is a slender guard, and the thorns are apt to chafe the stem of the tree. The most effectual, but expensive guard, is composed of four posts put down in a square, with rails mortised into them; and to be effectual, the posts should be put at such a distance and height, and the rails so close, that cattle may not be able to injure the tree: the posts also should be set slanting outwards, that the area of the fence may be widest at top. Some persons set only three posts in a triangle, connected by rails, in the same way as four; in both cases, care should be taken that the lower be sufficiently close, to prevent sheep from creeping through, for, especially when snow is on the ground, they will be sure to bark the young trees. The plantation will require copious watering the first summer, if the season should prove dry: the surface over the roots should be kept from grass and weeds, and in a loose pulverized state, so as to allow the roots to spread horizontally on every side. In Herefordshire, the soil of orchards is generally kept under tillage; in Gloucestershire, in grass: either mode has its disadvantages.—Fruit-trees when fully grown, especially if they be of a spreading growth, and are suffered to form drooping branches, are very injurious to arable crops, at least in our moist climate; their roots, their drip, and their shadows, are destructive, not to corn only, but to clover and turnips: they also impede the circulation of the air, as has been before noticed, and are in the way of the plough-teams. It is however certain that tillage is favourable to the growth of young trees; whereas in grass grounds, their progress is comparatively slow, for want of the earth being stirred about their roots, and through the injuries they receive from cattle when grazing. Hence, where circumstances will allow, it is best to plant fruit-trees upon a newly broken-up sward, to keep the soil under a state of arable management until the trees be well grown; then to lay it down to grass, and let it so remain until the trees be removed, and their roots decayed, when it will again require a course of arable management. After orchard trees are planted and fenced, they have seldom any more care bestowed upon them; boughs are suffered to hang dangling to the ground, their heads so loaded with wood as to be impervious to the sun and air, and they are left to be exhausted by the moss and misletoe. By this redundancy of wood, the roots are unprofitably exhausted; the bearing wood is robbed of a part of its sustenance, and the natural life of the tree unnecessarily shortened; the outer surface only is able to mature fruit properly; every inner and underling branch ought therefore to be removed. It is common to see fruit-trees with two or three tiers of boughs pressing hard upon one another, with their twigs so intimately interwoven, that a small bird can hardly creep in among them. Trees thus neglected, acquire, from want of due ventilation, a stinted habit, and their fruit becomes of a crude and inferior quality. Misletoe is a great enemy to Apple orchards, and is frequently permitted to be very injurious to them: the ordinary method of clearing trees from it, is to pull it out with hooks in frosty weather, when being brittle it breaks off from the branches. Sheep are as fond of it as they are of Ivy; but although a labourer could clear fifty or sixty trees in one day, the Herefordshire orchards are generally injured, and often exhausted, by this parasite. The trees are also very often entirely subdued by Moss, which kills many trees, and injures others so much, that they are only an incumbrance to the ground, and a disgrace to the country: this evil may be easily checked, and in great measure avoided. In Kent, there are men who make it their business to clean orchard trees from Moss, at a certain price by the tree, or by the whole. Draining the land, if two retentive of moisture, will sometimes prevent or cure Moss; or digging round the trees in winter, and bringing fresh mould, or the scouring of ponds and roads, or the rubbish of old walls well prepared and pulverized, and laid round the trees; for whatever promotes the health of the tree, will in some degree mitigate these and other diseases. When fruit-trees are hidebound, they are scored, by cutting the bark with the point of a knife, from the top to the bottom of the stem. Spring frosts are an enemy against which it is very difficult to guard orchard trees: dry frosts are observed only to operate in keeping the blossoms back; but wet frosts after rain, or a foggy air, and

before the trees have had time to dry, are very injurious, even to the buds. This cannot be avoided: much however may depend on the strength of the blossoms; all the assistance that art can give in this case is, to keep the trees in a healthy vigorous state, to enable them to throw out strong buds and blossoms; and by keeping them thin of wood, to give them an opportunity of drying quickly, before the frost sets in. Blights are very often fatal to the vernal blossoms, and the consequent crop of fruit. Were it not for this enemy invading orchards in May, many persons think there would be a crop of fruit every year as regularly as there is a crop of corn. Perhaps if trees in the full vigour of their life were to be kept in perfect order, and not suffered to over-bear themselves, this constant fertility might be looked for, if they were not attacked by natural evils; and perhaps these natural evils might be in some degree mitigated. But when trees are badly planted on an unpropitious soil, or ill-grafted on an infirm stock, have little care bestowed on them to protect them from cattle, and to keep them free from Moss and Misletoe, are suffered to run to unprofitable wood, and when they have a hit, as it is called, or bear a large crop of fruit, it is beaten down with poles or sticks, by which the buds that are forming for the succeeding year are mostly bruised or beaten off; is it any wonder that with all this ill management, neglect, and bad usage, that the crop of fruit should often fail, or that spring frosts and blights should have their full effect upon the trees so weakened and injured? It seems rather surprising that, instead of bearing once in two or three years, they should ever bear at all. The term Blight, (see that article,) seems to be vague and indefinite; and whether insects be the cause or effect of it, does not yet seem to be settled. It has however been asserted, that if a piece of mat or white paper be thrown over a tree at night, and examined in the morning, if there has been a blight, there will be little black spots like the point of a pin. They seem lifeless; but if the sun shine, by twelve o'clock they will be in motion. By next morning they will be gone from the mat, and then, and not till then, they go into the leaves of the trees, where they form nests, and do the mischief. In two or three days after the blight has infected an orchard, the leaves of the trees will be curled. If the inside be examined with a powerful microscope, a thousand small insects will be seen; these will seize upon the half-formed embryo, and destroy it in the midst of its fading leaves. If the blossom be not out, or the fruit formed, when these vermin arrive, they do no injury; but if the young fruit be just formed, and not of sufficient strength to repel the attack, it falls an immediate sacrifice to their depredations. The critical period at which the fruit is subject to the mortality of the blight, lasts only a few days; and therefore by having orchards in different aspects, there will be a great probability that one or other of them may escape it: the utmost assistance that art can afford, is to keep the trees in a state of health and vigour. Smaller insects are hurtful to the leaves, blossoms, and nascent fruit; larger insects devour the fruit in a state of maturity. Apples, particularly cider fruit, are of a texture firm enough to resist their attacks; but in some years wasps devour great quantities of pears; so that if a price were set in the spring upon every wasp that comes out in May, it might be the means of destroying many nests by anticipation.—The Devonshire orchards are generally situated in valleys, and dips, or hollows, or near houses, and not spread over the arable land and pasture ground as in Herefordshire and Gloucestershire. Some of them lie bleakly exposed to the north; others in the current of the south-west wind. But those which succeed best are neither exposed to the north-east, nor to the sea-winds from the west and south-west. The richest deepest soils appear to have been chosen for orchard grounds; the shallower soils are probably unfit for fruit-trees; but where situation will admit, such as are encumbered with large stones, with good soils intervening, are singularly eligible. In Kent, particularly about Maidstone, are many small inclosures, from one to ten acres, and somewhat more, planted with fruit of different kinds, for which the rocky soil of the neighbourhood seems particularly adapted. The best method known there for raising orchards of Apples and Cherries, and plantations of Filberts, is to plant them among hops. The constant culture of the land for the hops, with the warmth and shelter they afford the young trees, causes them to grow with great luxuriance. It is a very common practice to plant Hops, Apples, Cherries, and Filberts, all together. Eight hundred Hop-hills, two hundred Filberts, and forty Cherry and Apple trees, to an acre. The Hops stand about twelve, and the Filberts about thirty years: by which time the Apple and Cherry trees require the whole land. Sometimes Apple and Cherry trees are planted in alternate rows, with two rows of Filberts between each row. The method of planting Apple and Cherry trees, is to dig holes about two feet square, and two spits deep, taking out the rock, and turning down the surface of the soil, on which the young tree is placed, and the remainder of the earth is trodden down close about the roots. The trees are supported by stakes until they get sufficient strength not to be hurt by gales of wind. A composition of lime and night-soil is painted on their stems with a brush, which is said to promote not only their growth, but to protect them from cattle. The soil preferred for Cherries is a deep loam upon the rock: if grown by themselves, they are planted from twenty to thirty feet distant, and are put somewhat deeper in the earth than Apples, though in other respects the management is the same. Cherries seem to affect a calcareous soil, if we may judge from the size and flourishing state of the Black Cherry in the Chiltern part of Buckinghamshire, on the almost bare chalk-rock. In some parts of Ireland it is the common practice, in planting orchards for Apples for making cider, to set cuttings three or four feet long half way in the ground, of such sorts as grow rough and knotty in the wood. They are called *Pitchers*, and rarely fail to yield well and soon.—*Pruning Orchards.* If pruning be judiciously performed, fruit trees will come into bearing sooner, and continue in vigour for nearly double their common age. No branch should ever be shortened, except for the figure of the tree, and then it should be taken off close at the separation. The more the range of branches shoot circularly, a little inclining upwards, the more equally will the sap be distributed, and the better will the tree bear. The ranges of branches should not be too near each other, that the fruit and leaves should all have their full share of sun; and where it suits, the middle of the tree should be so free from wood, that no branch crosses another, but all the extremities point outwards. October or November, or as soon as the fruit is off, is the proper season for pruning. Few men cut true enough with a bill, it is therefore best to take off superfluous branches with a saw, and afterwards to smooth the places with a knife: for it is essential that every branch which is to come off should be cut perfectly close and smooth. The wounds must then be smeared over with a medicated tar. The bark cannot grow over a stump, because there is no power to draw the sap that way; for which reason it is always advisable to cut a little within the wood. Every branch should be taken off that comes near to the ground, that has received any material injury, where the leaves are much curled, or

that has a tendency to cross the tree, or run inwards: a little attention may also be paid to the beauty of the head, leaving all the branches as nearly equidistant as possible. If then there be any remaining blotches, open or score them with a knife, and, where the bark is ragged from any laceration, pare it gently down till you come to the live wood, touching over each with the medicated tar. After this, rub the Moss clean off, and score the trees; in doing which, take care not to cut through the inner or white rind which joins the bark to the wood. When trees are much thinned, they are subject to throw out a great quantity of young shoots in the spring; these should be rubbed off, and not cut, for cutting increases the number. The medicated tar is composed of half an ounce of corrosive sublimate, reduced to fine powder by beating it with a wooden hammer, and then put into a three-pint earthen pipkin, with about a glassful of gin or other spirit, stirred well together, and the sublimate thus dissolved. The pipkin must then be filled by degrees thus vegetable or common tar, and constantly stirred till the mixture is intimately blended. This quantity will be sufficient for two hundred trees. Being of a very poisonous nature, it should not be suffered to lie about the house. The sublimate dissolves better, when united with the same quantity of spirit of hartshorn or sal ammoniac. This mixture being apt to run, consistency may be given it by mixing pounded chalk or whiting.—*On Planting Orchard Trees*, &c. If possible, choose the trees the year before they are to be planted, and see that they are properly pruned in the nursery, by taking off close all rambling and unsightly branches, leaving only three or four good leading shoots: by this forecast, the trees will not require pruning for some time; and it will greatly accelerate their growth, that they have no wounds to be healed in the year of their being transplanted. Take care that your trees be young; and plant no galled, fretted, or cankered plants. When they are taken up, retain the roots as long as is convenient, which will dispose them to run horizontally, from which, as they are more under the influence of the sun, the sap becomes better concocted, and produces the fairest and sweetest fruit. An orchard should be screened on the east, north, and west sides, and open to the south. The natural growth of the different fruit should be attended to in the disposition of the trees. One row of the tallest strongest growers should be planted on the three cold sides, and that row should be planted twice as thick as any other; then one row more of the next free-growers, parallel to the last rows; and so on, gradually declining in size till you come to the centre. The intention here is to raise shelter; and it would be advisable, on the outside of these outer rows, to run a shaw or belt of underwood, more than a pole wide, of four or six rows of the freest-growing trees which the country produces; the wood of which will more than pay the expense. Half the trees should be cut down in about fourteen years, to become stools, and the other half at a proper distance of time; so that the belt, for the whole duration of the orchard, shall be of young wood, and feathering down to the bottom. Nothing can be better for this purpose than the Sweet Chesnut, where the soil suits it. The Hawthorn likewise, properly trained, has a wonderfully good effect in blunting or absorbing the baneful quality attendant upon the blighting air. Before the ground be laid out, be careful to secure the little risings or inflections, to catch the sun, and exclude the cold. Firs may be happily introduced at a distance for shelter: all together might be so disposed as at the same time to protect the fruit, and heighten the appearance of the grounds. Such an orchard may often bear a crop when the neighbourhood in general fails; and every one knows the value of a good crop in a failing year. The plantations, belt, and larger trees, will keep off the blighting winds; and the orchard being open in the middle and to the south, the stagnant vapours which stint the fruit in the spring will be dissipated, and each tree will enjoy the influence of the sun and air. Besides, the ground being open in the middle, the herbage will be the more valuable. In new plantations, avoid planting too deep or too thick. Sunshine will bring sweet fruits; while shade, and planting the trees too deeply in the earth, will place the roots beyond the influence of genial warmth, and produce crude acid juices. When the top of a tree separates by the weight of its branches, an iron bolt may be introduced, by boring a hole through the upper part of the cleft with an half-inch auger; first cutting the bark and some of the wood with a chisel, so as the head at one end, and the nut and screw at the other, may be hid under the bark, which will soon grow over the iron, if often touched over with the medicated tar. There is not any culture we are acquainted with equal to Hops, for raising an orchard; and when the proper time for grubbing up the Hops comes, the trees may be secured, and the land turned to grazing. It would be better not to take up the Hops all at once, and to crop the vacant land for two or three years with Potatoes. Thus the trees would continue in better health by taking away the shelter gradually. Let the agriculture be what it may, the land should never be ploughed or dug deep directly over the roots of a newly planted fruit-tree; for as the roots collect the best sap from their extreme points, if those points be broken off from the upper side of the roots, the tree is compelled to subsist on nurture drawn from the under strata, and consequently the sap will be of a worse quality. Where hogs and poultry are constantly running over the ground, the trees seldom fail of a crop, which is the best proof that manure is necessary. Any manure will suit an orchard; but the sweepings of cow-houses, hog-yards, slaughter-houses, dog-kennels, emptying of drains, &c. are more disposed to facilitate the growth and promote the health of fruit trees, than manure from the stable. Watering in dry weather tends much to keep the trees in health, and to secure their bearing by swelling the buds for the next year's crop; for when the buds are strong at first coming out, they are not so liable to blight. Those sorts of fruit which are known to thrive best in the neighbourhood, should in general be preferred: and care should be taken not to suffer trees to bear much fruit whilst young. Where trees are much overrun with Moss, a strong man, with a good birch broom, in a wet day, would do great execution. On young trees, the best method of destroying Moss, is to rub all the branches, spring and autumn, with a hard scrubbing-brush and soap-suds, as a groom does a horse's legs. Canker in a great measure arises from animalcules; and where the only object is to remove this disease, hog's lard is preferable to tar; but where wet is to be guarded against, tar is better. If the soil of an orchard be a strong clay, chalk, or a cold sharp gravel, plant the trees above ground, raising over them a little mound of good fresh mould, as large as an extensive ant-hill, sowing the top with White Dutch Clover. It is recommended that the rows of trees should not stand north and south, but a point of the compass towards the east; as the sun will then shine up the rows soon after ten o'clock, which in the spring will serve to dissipate the vapours collected in the night, and thus prevent the fruit from being stinted in the early stages of its growth.—*On Root Pruning.* When a tree has stood so long that the leading roots have entered into the under strata, they are apt to draw a crude fluid, which the organs of more delicate fruit-trees cannot convert into such

balsamic juices as to produce fine fruit. To prevent this evil, as soon as a valuable tree begins to show a sickly pinkiness upon the leaves, or the fruit inclining to ripeness before it has acquired its full growth, at the same time the bark becoming dry, hard, and disposed to crack; let the ground be opened for three or four feet, and with a chisel cut close every root the least tending downwards. Should there be any mouldy appearance or rottenness among the roots, take them off, and wash the others clean; and if the ground be too wet, throw a few stones or brickbats under the stem of the tree. As the roots invariably collect the sap from the extreme points, this cutting compels the horizontal roots to work and exert themselves; and if there be any energy left, they will soon throw out fresh fibres, and thus collect a more congenial sap for the support of the tree. At the same time cover the ground thinly over with manure as far as the roots may be supposed to extend; rub the stem and branches with soap-suds; and water the ground in very dry weather. There is nothing so likely to produce canker as the descending roots, though canker may certainly arise from an improper soil, a vitiated sap, the generation of vapour, animalcules, and the want of a free circulation of the fluids; the last especially often causes it, being brought on by injudiciously shortening the leading branches. The medication before recommended will stop the progress of the evil on the parts to which it is applied; but the canker may again break out on the other parts of the same tree, and that arises from the roots striking into a cold congenial subsoil.—*Tools.* The tools wanted in an orchard are: two pruning-knives, a saw two chisels, a mallet, a spoke-shave, and a painter's brush. With the chisels and spoke-shave work upwards, or the bark will shiver: the saw must be coarse-set, all the other tools sharp and smooth. The blade-bone of a doe will be found better than the iron of the spoke-shave, to rub off the rotten bark-moss, &c. See *Nursery*, *Planting*, *Pruning*, and the genera *Pyrus* and *Prunus*.

Orchis; a genus of the class Gynandria, order Diandria. —Generic Character. *Calix;* spathes wandering; spadix simple; perianth none. *Corolla:* petals five, three outer, two inner, converging upwards into an helmet; nectary one-leafed, fastened to the receptacle by the lower side between the division of the petals; upper lip erect, very short; lower lip large, spreading, wide; tube behind horn-shaped, nodding. *Stamina:* filamenta two, very slender, very short, placed on the pistil; antheræ obovate, erect, covered with a bilocular folding of the upper lip of the nectary. *Pistil:* germen oblong, twisted, inferior; style fastened to the upper lip of the nectary, very short; stigma compressed, blunt. *Pericarp:* capsule oblong, one-celled, three-keeled, three-valved, opening three ways under the keel, cohering at the top and base. *Seeds:* numerous, very small, like saw-dust. Essential Character. *Nectary:* a horn or spur behind the flower.—The species of Orchis are found, some of them copiously, in meadows or moist groves, others more partially and sparingly on dry chalky hills: they flower in June and July, and are most beautiful, some of the kinds very richly scented. All the plants of this genus, for the singularity and beauty of their flowers, deserve a place in every good garden; and the reason of their not being more cultivated in gardens is, that it is difficult to transplant them. This difficulty may however be easily overcome, where a person has an opportunity of marking their roots in the time of flowering, and letting them remain until their leaves are decayed, when they may be transplanted with safety; for it is the same with most sorts of bulbous or fleshy-rooted plants, which, if transplanted before their leaves decay, seldom live, even where a large ball of earth is preserved about them; for the extreme parts of their fibres extend to a great depth in the ground, from whence they receive their nourishment; and if these fibres be broken or damaged by taking up the roots, they seldom thrive after, although they may remain alive a year or two. This remark applies to Tulips, Fritillarias, and other similar roots, when removed after they have made shoots: so that whoever would cultivate them, should search them out in their season of flowering, and mark them; and when their leaves are decayed, or just as they are going off, the roots should be taken up and planted in a soil or situation as nearly as possible resembling that wherein they naturally grow, otherwise they will not thrive; so that they cannot be placed all in the same bed, for some are only found upon chalky hills, others upon moist meadows, and some in shady woods, or under trees; but if the soil and situation be adapted to their various sorts, they will thrive and continue several years, and, during their season of flowering, will afford as great varieties as any flowers that are at present cultivated. These plants, Mr. Curtis remarks, multiply themselves very little, the small increase they make appearing to be from offsets: hitherto we have no satisfactory proof of their being propagated from seed; yet the seed-vessels in many of them are large, well-formed, and filled with seeds, which, though extremely minute, appear perfect. The smallness of the seed is certainly no argument against its vegetating: some of the Ferns, the seed of which are much smaller, are now well known to be propagated from seed; and it is most probably owing to a want of minute attention, that the progress of Orchis seedlings has not been yet accurately observed. Such as are disposed to doubt the vegetative power of these seeds, may perhaps urge that their barrenness is owing to their not being properly impregnated; the antheræ in this tribe appearing to be different in their structure from those of other plants, and not containing, so far as we have yet been able to discover; any similar pollen. ——The species are,

**Helmet of the Corolla spurred.*

1. Orchis Carnea; *Great-flowered Cape Orchis.* Bulbs undivided; helmet of the corolla two-spurred; bractes erect; leaves roundish, grooved underneath; spike compact; flowers inodorous, white within, flesh-coloured without.—Native of the Cape.

2. Orchis Bicornis: *Yellow-flowered Cape Orchis.*—Bulbs undivided; helmet of the corolla two-spurred; lip five-parted; bractes reflex; leaves ovate, oblong, marked with lines underneath; spike loose; flowers very fragrant, smelling like cloves, of a yellowish green colour. They are extremely sweet-scented, and appear in September.—Native of the Cape.

3. Orchis Biflora; *Two-flowered Orchis.* Bulbs undivided; helmet of the corolla one-spurred; wings spreading; lip lanceolate, acuminate; root-leaves ovate, small; flowers from three to five in a raceme, remote, pedicelled.—Native of the Cape.

4. Orchis Cornuta; *Horned Orchis.* Bulbs undivided; helmet of the corolla one-spurred; wings spreading; lip very small, subovate; leaves on the stem many, alternate, large, lanceolate, sheathing at the base; spike loose.—Native of the Cape.

5. Orchis Spathulata; *Spathulate Orchis.* Bulbs undivided; helmet of the corolla spurred; root-leaves very many, linear, shorter by half than the stem; scape a span high, sheathed; leaves acute, scariose, wider; flowers generally two, alternate.—Native of the Cape.

6. Orchis Tripetaloides; *Three-petalled Orchis.* Leaves lanceolate; helmet of the corolla arched, blunt, spurred;

nectary lanceolate, very small; stem a foot high, even; root-leaves several, a hand in length; flowers alternate, distinct. —Native of the Cape.

7. Orchis Sagittalis. Helmet of the corolla spurred, two-eared; lip lanceolate; root-leaves four or five, shorter by half than the stem, lanceolate, bluntish; stem a span high, covered entirely with leafy, membranaceous, acute sheaths. —Native of the Cape.

8. Orchis Barbata; *Bearded Orchis.* Helmet of the corolla erect, spurred; nectary subtrifid, ciliate; bulbs oblong, undivided, very hairy.—Native of the Cape.

9. Orchis Draconis; *Dragon Orchis.* Bulbs undivided; helmet of the corolla spurred; nectary linear, ovate at the tip; scape a foot and half high, of the thickness of a goose-quill, wholly sheathed with leaves; spike with few flowers, somewhat remote; bractes broad lanceolate, netted, veined, the length of the germen.—Native of the Cape.

10. Orchis Tenella; *Delicate Orchis.* Helmet of the corolla spurred, conical at the base; nectary linear; stem the length of the thumb; leaves both on the root and stem linear; spike oblong, with from five to eight flowers.—Native of the Cape.

11. Orchis Monorrhiza; *One-bulbed Orchis.* Bulb solitary; lip of the nectary three-parted, the lateral parts bristle-shaped; horn linear, compressed, the length of the germen; leaves oblong; stem simple, upright, from eighteen to twenty-two inches high.—Native of Jamaica and Hispaniola.

** *Bulbs undivided.*

12. Orchis Sancta; *Palestine Orchis.* Bulbs undivided; lip of the nectary lanceolate, five-toothed, horned, curved in; petals converging; stem a foot high, for the most part naked, but having one or two sharp leaflets at top.—Native of Palestine.

13. Orchis Susannæ. Bulb undivided; wings of the nectary wider, ciliate; stem a long span or a foot high, slender; flowers white; lower leaves short, acuminate, embracing; upper longer, green, round, smooth.—Native of Amboyna, and a very elegant species.

14. Orchis Radiata. Bulbs undivided; wings of the nectary wider, ciliate; stem round, striated, sheathed with leaves, erect, a span high; leaves alternate, sheathing, ensiform, channelled, from erect spreading, striated, smooth, nearly equal to the stem, the upper ones smaller, about five in number; flowers alternate, about three, flowering successively.—Native of Japan.

15. Orchis Ciliaris; *Fringe-lipped Orchis.* Bulb undivided; lip of the nectary lanceolate, ciliate; horn very long; stem tall, firm, having at the lower part two or three oblong, wide, liliaceous, embracing leaves, and some smaller leaves, above; spike not very long, composed of clustered flowers; helmet small, and acute.—Native of Maryland, Virginia, and Canada.

16. Orchis Habenaria. Bulbs solitary, undivided; lip of the nectary three-parted; lateral ones bristle-shaped; horn filiform, much longer than the germen; stem erect, leafy, from one to two feet high, simple, angular, smooth; flowers in spikes, alternate, scattered at a little distance, white; corollas five-petalled. The flowers of this species are very singular.—Native of low meadows at the foot of the mountains of Jamaica.

17. Orchis Bifolia; *Butterfly Orchis.* Bulbs undivided; lip of the nectary lanceolate, quite entire; horn very long; petals spreading. One of the bulbs is always wrinkled and withered, while the other is always plump and delicate. The first is the parent of the actual stem; the second is an offset, from the centre of which the stem of the succeeding year is destined to arise. Such is the mode of increase, not only in this species, but in the other bulbed Orchises; and such are the means that nature uses, not only to disseminate plants, but to enable them to change their place, and thus to draw in fresh nutriment; for the second root is always about half an inch from the centre of the first, insomuch that in twenty years the plant will have marched ten inches from the place of its birth. The process is the same in the handed sorts, or those species which have the bulbs divided, and lengthened out like the fingers; and even in fibrous roots, for some of the fibres are continually rooting and perishing, whilst other young and tender ones are protruding, lengthening, increasing, and preparing for the vegetation of the succeeding year. This species has obtained the name of Bifolia, on account of its radical leaves being generally two; three however are frequently met with; and they are commonly said to be opposite. The root of this species appearing to be large, it appears to be as well calculated for making Salep as any other.—This Orchis, if not so common as some, is much more so than others, being found generally in woods, pastures, and heaths, especially in soils somewhat stiff and moist. In dry pastures it is often so small as to be noted for a variety. It varies not only in size, but in the shape and number of the leaves, the number of flowers, the length of the spur, and the time of flowering, which is later in the small one. It occurs in Norwood in Surry; in Charlton wood, and on Pen's common near Bekenham in Kent; in Madingley wood, Whitwell, Linton wood, Balydown hill, Kingston wood, Gamlingay wood; Cambridgeshire; Shotover hill, and Tar wood, Oxfordshire; Short wood, near Pucklechurch, Gloucestershire; Envil in Staffordshire; and is common in the shady woods and lanes of Leicestershire.

18. Orchis Ornithis; *Bird Orchis.* Bulbs undivided; lip of the nectary roundish; horn twice the length of the germen, the three outer petals converging, the others spreading very much; stem a foot and half high, leafy, round, upright, striated above the leaves. The two outer petals spread out like the wings of a bird in the act of flying, from which the name is derived; corolla white. It flowers in August.—Native of the mountains of Austria.

19. Orchis Flexuosa; *Winding-stalked Orchis.* Bulbs undivided; lip of the nectary imbricate; two petals concealed, filiform; scape flexuose; root-leaves ovate; leaves alternate, remote, sheathing, lanceolate, small; flowers small, remote. —Native of the Cape.

20. Orchis Cucullata; *Cowled Orchis.* Bulbs undivided; lip of the nectary trifid; petals confluent; stem naked; root-leaves two, ovate.—Native of Siberia.

21. Orchis Globosa; *Round-spiked Orchis.* Bulbs undivided; lip of the nectary resupinate, trifid; middle emarginate; horn short; petals awl-shaped at the tip; scape firm, a foot or eighteen inches high, leafy; spike short, very much crowded; flowers frequently turned upside down, so that the lip turns to the base of the spike, and the helmet or hood recedes from it. The whole corolla is purple, with deeper spots on the lip.—Native of Germany, Austria, Carniola, Switzerland, the south of France, and Italy.

22. Orchis Pyramidalis; *Pyramidal Orchis.* Bulbs undivided; lip of the nectary two-horned, trifid, equal, quite entire; horn long; petals sublanceolate; stem from eight to fifteen inches high, round, or slightly angular, smooth and firm, almost covered with leaves; flowers very numerous, crowded into a short blunt cone, forming a most elegant termination to the stem, deep flesh colour, or pale purple. It flowers later than the other species.—Native of many parts of Europe; as, Sweden, Belgium, Switzerland, Austria, Car-

niola, France, Italy, and Britain. It is found about Harefield in Middlesex; Dartford in Kent; Stocking wood in Leicestershire; Chesterton, Hinton, Devil's Ditch near Newmarket, and Linton, in Cambridgeshire; Whichwood forest, between Woodstock and Enston; and on Caversham warren in Oxfordshire; and also in Scotland.

23. Orchis Corsoppora; *Lizard Orchis.* Bulbs undivided; lip of the nectary trifid, reflex, crenate; horn short; petals converging; stem erect, a foot high, round, jointed, smooth, leafy; leaves seven or eight, all sheathing, the lowest four inches long, the others gradually less, bright green, very smooth, five or six of them spreading, the others rolled round the scape. Some say the flowers smell like a goat, others like a bug.—Native of Denmark, Germany, the southern parts of Europe, and the Levant. It flowers in June.

24. Orchis Cubitalis. Bulbs undivided; lip of the nectary trifid, filiform, middle ovate; horn shorter than the germina; stem a foot and half high; leaves towards the root four or five, alternate, sheathing, lanceolate; the rest of the stem without leaves.—Native of the island of Ceylon.

25. Orchis Morio; *Female* or *Meadow Orchis.* Bulbs undivided; lip of the nectary quadrifid, crenulate; horn blunt, ascending; petals blunt, converging; flowers few, from six to eight, seldom more that twelve, purple, sitting loosely on the stalk. There are varieties with red, violet, flesh-coloured, and white flowers; but in all it retains more or less strongly the green parallel lines, with which the two outermost petals are strikingly marked. This has been said to be the true sort which produces the Oriental Salep; but it is clear that more species than one are used for it, because some of the roots imported in that drug are undivided, as in this, and others are palmated. Some of the other species have larger roots than this; and the quality of all appears to be the same. It grows in meadows that are moderately dry, such as Cowslips are usually found in, and is sometimes so abundant as to empurple the spot it grows on. It flowers in May and June; and is eaten by goats, but horses refuse it.

26. Orchis Mascula; *Male* or *Early Spotted Orchis.* Bulbs undivided; lip of the nectary four-lobed, crenulate; horn blunt; dorsal petals bent back; flowers in a loose spike, numerous; bractes lanceolate, membranaceous, longer than the germen. The spikes of the flowers, says Lightfoot, are the *Long Purples*, or *Dead-men's Fingers*, which helped to compose Ophelia's garland.. The Queen describing the manner of Ophelia's death, says,

> "There is a willow growing o'er a brook,
> That shows his hoary leaves to th' glassy stream,
> Near which fantastic garlands she did make
> Of Crow flowers, Nettles, Daisies, and *Long Purples*,
> Which lib'ral shepherds give a grosser name.
> But our cold maids, *Dead-men's Fingers* call them."
> *Hamlet*, Act. IV.

The grosser name here alluded to, is that of Fools' Stones, by which there appears no reason to doubt that this is the plant alluded to, although the name of Dead-men's Fingers would better suit the thirty-fourth species. The roots abound with a glutinous slime, of a sweetish taste, and a faint and somewhat unpleasant smell. This mucilaginous or gelatinous quality of the Orchis root, has recommended it as a demulcent; and it is generally used in the same complaints as the roots of Althea and the Gum Arabic. M. Mault, of Rochdale, has favoured the world with the following method of curing the Orchis root: It is to be washed in water while fresh, and the fine brown skin which covers it is to be separated by means of a small brush, or by dipping the root in hot water, and rubbing it with a coarse linen cloth; when a sufficient number of roots have been thus cleaned, they are to be spread on a tin plate, and placed in an oven heated to the usual degree, where they are to remain six or ten minutes, in which time they will have lost their milky whiteness, and acquired a transparency like horn, without any diminution of bulk: being arrived at this state, they are to be removed, in order to dry and harden in the air, which will require several days; or by using a very gentle heat, they may be finished in a few hours. The properest time for gathering the roots, is when the seed is formed, and the stalk is ready to fall; because the new bulb is then arrived at its full maturity, and may be distinguished from the old one by a white bud rising from the top of it. Salep, considered as an article of diet, is accounted extremely nutritious, containing a great quantity of farinaceous matter in a small bulk; and hence it has been thought fit to constitute a part of the provisions of every ship's company, to prevent a famine at sea. For it is observed by Dr. Percival, that this powder, and the dry gelatinous part of a flesh or portable soup, dissolved in boiling water, form a rich thick jelly, capable of supporting life for a considerable length of time. An ounce of each of these articles, with two quarts of boiling water, will be sufficient subsistence for each man per day. The same physician not only recommends the use of Salep in diarrhœa, dysentery, dysury, and calculous complaints; but he thinks that in the symptomatic fever, which arises fom the absorption of pus, from ulcers in the lungs, from wounds, or from amputation, Salep, used plentifully, is an admirable demulcent, and well adapted to resist that dissolution of the crasis of the blood which is so evident in these cases. Dr. Withering justly expresses a hope, that as this plant can be procured at home in almost any quantity, we shall no longer depend upon foreign markets for supplies. It flowers in April and May, and is common in most of our woods and meadows.

27. Orchis Ustulata; *Dwarf Orchis.* Bulbs undivided; lip of the nectary quadrifid, rugged with dots; horn blunt, very short; petals distinct; stem from four to six or eight inches high, angular, almost hid by the upper leaves. Villars observes, that this is one of the smallest species: the leaves narrow, glaucous, or silvery; spike short, ovate, close, small, appearing blackish at the top, whence its name *Ustulata;* and bright red, or whitish towards the base; this appearance is caused by the upper petals, which open last, being of a very deep colour on the outside, and of a bright red within, contrary to the usual case with flowers, which have commonly the colours lighter in the parts most exposed to the air. This elegant little plant is distinguished at first sight by its small dotted flowers, which appear in May and June.—It appears in great quantities on many of our downs, and affects a dry calcareous soil. It occurs near Harefield, in Middlesex; on Gogmagog hills, in Devil's Ditch, and at Chippenham, in Cambridgeshire; at Barneck heath, near Stamford; and between Stamford and Duddington, in Northamptonshire; on Wick cliffs; and on the Wiltshire downs, as upon Salisbury plain, particularly on the Barrows, near Stonehenge; on Burford down, and Caversham warren, in Oxfordshire.

28. Orchis Militaris; *Man Orchis.* Bulbs undivided; lip of the nectary five-cleft, rugged with dots; horn blunt; petals confluent; stem about one foot high, round, smooth; leaves about four, sheathing, acutely lanceolate, the three lower spreading, the upper one closely embracing, bright green, with numerous parallel veins; spikes from one to two inches long, with numerous flowers.—It is found in calcareous meadows and pastures: as at Crawsham hills, by the Thames' side; not far from Reading in Berkshire; and near the old chalk-pit, by the paper-mill, at Harefield; as also at Caversham

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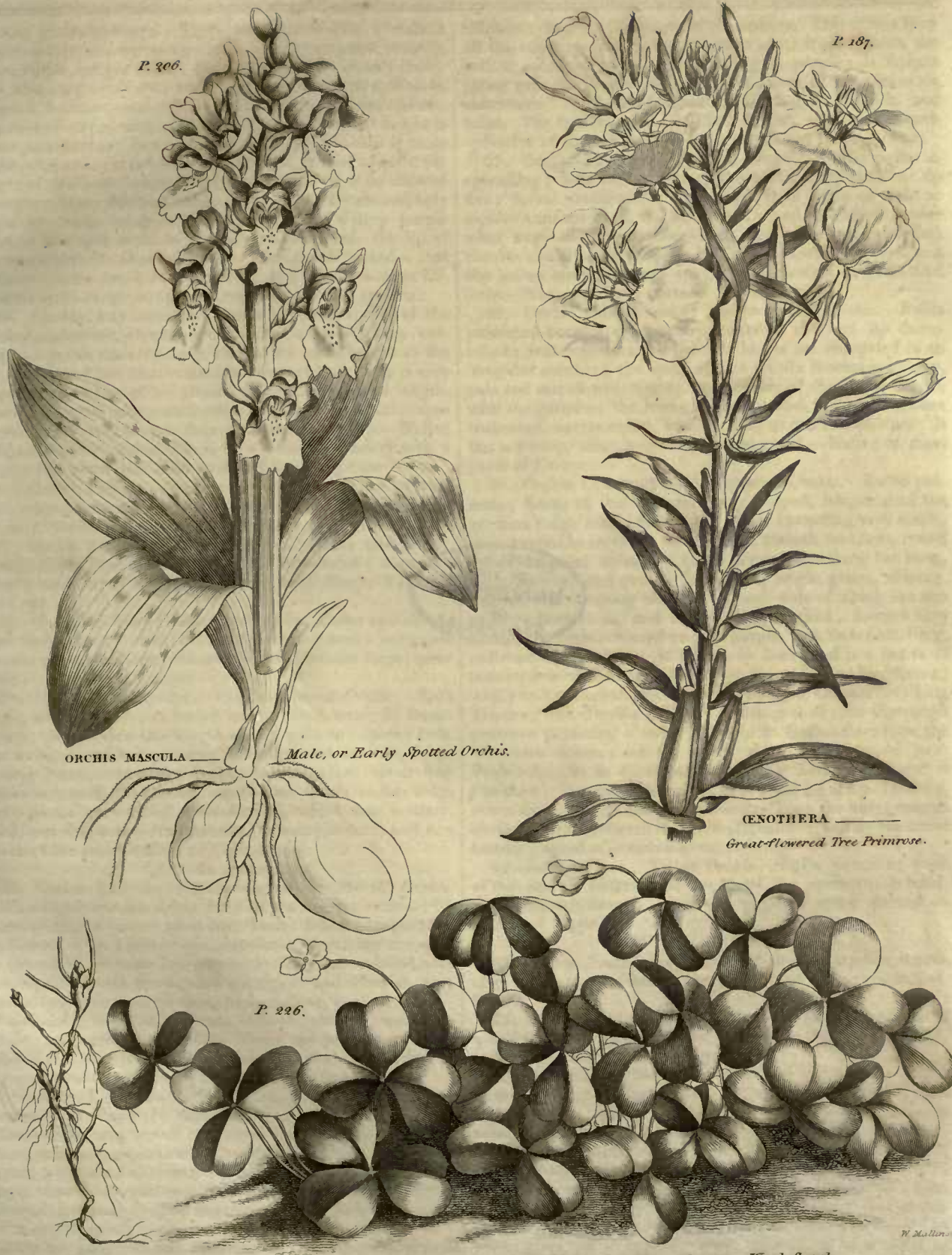

ORCHIS MASCULA ___ *Male, or Early Spotted Orchis.*

ŒNOTHERA ___

Great-flowered Tree Primrose.

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OXALIS ACETOSELLA ___ *Common Wood Sorrel.*

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warren, in Oxfordshire. There is a variety with a stalk a foot, two feet, and sometimes more in height, round, smooth, green below, purple above; flowers numerous, closely imbricate, in a long ovate-cylindrical spike. Curtis, Ray, Halley, Jacquin, Vaillant, and others, make this a distinct species. The first observes, that in exposed aspects its usual height is about nine inches; in woods and coppices, where it is more sheltered, and where the soil is richer, it will acquire the height of two feet, or more: such specimens must be allowed to surpass every British Orchis. Its flowers vary exceedingly in colour, some being of a light, others of a deep purple colour; now and then, one wholly white occurs; the lip of the nectary varies also in breadth. Dr. Smith remarks, that all the varieties smell like new hay; and he, as well as Dr. Withering, does not suppose them to be distinct species.

29. Orchis Papilionaeca. Bulbs undivided; lip of the nectary undivided, crenate, emarginate, widened; horn awl-shaped; petals converging. This is the same height as the preceding, and has almost the same flower; but the lip is very large, the full size of the thumb nail wider than its length, retuse, or emarginate, undivided, toothletted, blunt; spur converging, acute, shorter than the germen and lip.—Native of Spain and Carniola. There is a beautiful variety with a smaller lip, which has been observed flowering near Rome.

30. Orchis Pallens. Bulbs undivided; lip of the nectary trifid, quite entire; horn blunt, longish; petals spreading.—Native of Switzerland, Austria, Dauphiny, and Italy.

31. Orchis Hispidula; *Hairy Orchis.* Bulbs undivided; stem leafless; leaf round, hispid; lip five-parted; segments linear; root-leaves two, kidney-form, embracing.—Native of the Cape.

32. Orchis Speciosa; *Handsome Orchis.* Bulbs undivided; stem leafy; leaves wide, ovate; lip three-parted; segments flexuose; raceme large, many-flowered; flowers large, pure white.—Native of the Cape.

33. Orchis Plantaginea; *Plantain-leaved Orchis.* Bulb single, undivided; stem leafy; leaves broad, oval; lip three-parted; horn twice the length of the germen; leaves from four to eight, radical, pressing on the ground, smooth, deep-shining green, somewhat fleshy, many-nerved, about four inches long and three broad; spike four to six inches long, every where surrounded with flowers, which are solitary, white, and fragrant.—It flowers in the rainy season, and is a native of the moist valleys of Coromandel.

*** *Bulbs palmate.*

34. Orchis Latifolia; *Broad-leaved* or *Marsh Orchis.* Bulbs subpalmate, straight; horn of the nectary conical; lip three-lobed, the lateral lobes bent back; bractes longer than the flower; leaves five or six, alternate, sheathing the stem to the spike, acutely lanceolate, keeled, and marked with parallel veins, pale green, rarely spotted, and when so, very obscurely; flowers very numerous, in a close, somewhat conical spike, for the most part rose or flesh-coloured, and often purple, and sometimes white.—There are several varieties. It flowers at the end of May.—Found in the wet marshes of Europe; and was observed by Loureiro in Cochin-china.

35. Orchis Incarnata. Bulbs palmate; horn of the nectary conical; lip obscurely three-lobed, serrate; dorsal petals reflex. This very much resembles the preceding, but the leaves are pale green and unspotted, not dark green and spotted; the stem is shorter by half; the bractes are scarcely longer than the flower or germen; the corolla is pale flesh-coloured, not red; the two dorsal petals are quite bent back, not merely spreading, nor are they spotted.

36. Orchis Sambucina; *Elder-scented Orchis.* Bulbs subpalmate, erect; horn of the nectary conical; lip ovate, subtrilobate; bractes the length of the flowers. This differs from all the other species, in the structure of its fructification, the yellow colour of the flowers varying to purple; it flowers along with the Crown Imperial, and grows in wet places on mountains. The stem is about half a foot high, thick, and solid. The flowers smell like Elder flowers, whence its name.—Native of several parts of Europe, but not Great Britain.

37. Orchis Maculata; *Spotted Orchis.* Bulbs palmate, spreading; horn of the nectary shorter than the germen; lip flat; dorsal petals erect; stem solid, from seven or eight to eighteen inches high, the lower part round, the upper somewhat angular; flowers numerous, in a close conical spike; corolla usually pale purple. It varies with white flowers, and the leaves are not always spotted. It flowers in June and July.—Native of most parts of Europe.

38. Orchis Odoratissima; *Sweet-scented Orchis.* Bulbs palmate; horn of the nectary recurved, shorter; lip three-lobed; leaves linear; the palmate leaves are elongated in an irregular manner; the spike of pale purple flowers is oblong, pale red mixed with white; the nectary of the same length with the germen; the lower lip three-lobed, the two side ones truncated, nearly equal, and as long as the middle one. It has a strong, singular, but pleasant smell.—Native of most parts of Europe.

39. Orchis Conopsea; *Long-spurred Orchis.* Bulbs palmate; horns of the nectary bristle-shaped, longer than the germina; lips trifid; two of the petals spreading very much; stem twelve to eighteen inches high, smooth and firm, round below, angular upwards; lower leaves sheathing the stem, long, narrow, and acutely lanceolate, bright green, shining, keeled, with a strong midrib, on each side of which are two or three faint veins, and one strongly marked; flowers very numerous, flesh-coloured or pale purple, very sweet-smelling, and sometimes white. It flowers in June, and is a native of many parts of Europe. Found at Harefield in Middlesex; Asply in Nottinghamshire; King's Hedges, Chesterton; Hin, Triplow, and Devil's Ditch, Cambridgeshire; on the rough pastures adjoining Cowley common in Oxfordshire; on the Wiltshire downs; on the pastures under Shortwood near Pucklechurch, in Gloucestershire; on Knutsford moor in Cheshire; in a morass near Leeds; near Auchin Dewney, seven miles from Edinburgh; abundantly on the hilly grounds north of the river Leven in Dumbartonshire; and on the moist heathy ground of Newton park, Ireland.

40. Orchis Flava; *Yellow Orchis.* Bulbs palmate; horn of the nectary filiform, the length of the germen; lip trifid, quite entire; flowers obsoletely yellow; spike narrow.—Native of Virginia.

**** *Bulbs in bundles.*

41. Orchis Frutescens. Horn of the nectary the length of the germen; lip ovate, toothed at the base.—Native of Siberia.

42. Orchis Strateumatica. Lip of the nectary two-lobed, quite entire; horn the length of the germen; stem a span high.—Native of the island of Ceylon.

43. Orchis Hyperborea. Horn of the nectary the length of the germen; lip linear, quite entire, truncate; stem a palm high with the spike; corollas yellowish-green: uppermost petals wider, ovate; the two upper lateral ones lanceolate.

44. Orchis Abortiva; *Purple Bird's-nest,* or *Bird's-nest Orchis.* Bulbs filiform; lip of the nectary ovate, quite entire; stem leafless; roots composed of thick horizontal fibres, wrinkled transversely; flowers in a very long thin spike, violet; fruit the largest of any in the Orchis tribe. The whole plant, as it appears above ground, is of a violet or deep purple colour.—Native of the north of Europe.

45. Orchis Fimbriata; *Fringed Orchis.* Horn of the nectary longer than the germina; lip three-parted, ciliary; petals spreading; leaves oblong; stem upright, smooth, from ancipital acutely four-cornered; spike ovate oblong, many-flowered; flowers blue purple.—Native of Canada and Newfoundland.

***** *Bulbs yet unknown.*

46. Orchis Phychodes. Horn of the nectary bristle-shaped, the length of the germen; lip three-parted, ciliary; spike long, close.—Native of North America.

47. Orchis Spectabilis. Horn of the nectary the length of the germen; lip oval, emarginate; stem leafless; leaves oval; spike of five or six flowers.—Native of Virginia.

48. Orchis Filicornis. Nectary bifid; horn capillary; stem half a foot high, and more, somewhat flexuose.—Native of the Cape.

49. Orchis Tipuloides. Lip of the nectary three-parted, linear, almost equal; horn filiform, very long.—Native of Kamtschatka.

50. Orchis Japonica. Horn of the nectary recurved; lip awl-shaped, entire; stem somewhat angular, smooth, a span high; flowers many, in spikes, snow-white; corolla three-petalled, the two upper petals lateral.—Native of Japan.

51. Orchis Falcata. Horn filiform, very long; leaves ensiform, channelled, sickle-shaped; root-leaves several, equidistant, ensiform, convoluted, revolute-sickled, smooth, a finger's length, the lower ones shorter; flowers in spikes, —Native of Nagasaki, in the mountains, among shrubs.

52. Orchis Orbiculata. Labellum linear, very entire, somewhat obtuse; petals three, superior, approaching, two lateral, patent, oblique at the base; horn longer than the germen; scape diphyllous at the base; leaves plain, orbiculate.—Grows in shady beech-woods on the mountains of Pennsylvania and Virginia. Two leaves of a fleshy texture are spread flat on the ground, between which rises the stalk about a foot or eighteen inches high, which bears a loose spike of greenish-white flowers. It is known in the mountains by the name of *Heal-all.*

53. Orchis Dilatata. Labellum linear, very entire, somewhat obtuse, subrotundate-dilatate at the base; horn of the length of the labellum; germen shorter; bractes of the length of the flowers; stem leafy.—Grows in Labrador.

54. Orchis Lacera. Labellum tripartite; segments subdigitate-filiform; horn nearly equalling the germen; flowers alternate, greenish white.—Grows in low meadows from Pennsylvania to Virginia.

55. Orchis Quinqueseta. Labellum tripartite; segments setaceous; horn twice the length of the germen; flowers in a loose spike, alternate, distant; bractes acuminate; leaves ovate, acute.—Grows in the sandy low fields of Virginia and Carolina, on the side of swamps.

56. Orchis Discolor. Labellum tripartite, longer than the petals; lateral segments short, acute; horn filiform, and half as long again as the germen; leaf solitary, radical, ovate-cordate.—Grows in pine-barrens from New Jersey to South Carolina.

57. Orchis Obtusata. Labellum linear, very entire, longer than the horn; horn of the length of the germen; leaf solitary, radical, subcuneiform-obtuse.— Grows about Hudson's Bay, near Fort Albany. A small species.

58. Orchis Rotundifolia. Labellum trifid; horn shorter than the germen; leaves oval, subrotund.—Native of Hudson's Bay.

Origanum; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* involucre spiked, composed of imbricate, ovate, coloured bractes; perianth unequal, various. *Corolla:* one-petalled, ringent; tube cylindrical, compressed; upper lip erect, flat, blunt, emarginate; lower trifid, the segments almost equal. *Stamina:* filamenta four, filiform, the length of the corolla, of which two are longer; antheræ simple. *Pistil:* germen superior, four-cleft; style filiform, inclined to the upper lip of the corolla; stigma very slightly bifid. *Pericarp:* none; calix converging, fostering the seeds at bottom. *Seeds:* four, ovate. *Observe.* The involucre of the calix constitutes the essential character of the genus. The perianth is in some almost equal, five-toothed; in others two-lipped, the upper lip large, entire, the lower scarcely any; in others two-leaved. Essential Character. *Strobile:* four-cornered, spiked, with one leaf to each calix.——The species are,

1. Origanum Ægyptiacum; *Egyptian Marjoram.* Leaves fleshy, tomentose; spikes naked. This is a perennial plant, with a low shrubby stalk, seldom rising more than a foot and half high, and dividing into branches. The flowers are produced in roundish spikes, closely joined together at the top of the stalks, and at the end of the small side-branches; they are of a pale flesh colour, peeping out of their scaly coverings. Hasselquist informs us, that this plant is cultivated in the gardens at Grand Cairo on account of the smell, which is stronger than that of Dittany of Crete.—Native of Egypt, where it flowers from June to August. It is increased by slips or cuttings planted in a border of good earth in any of the summer months, shaded and duly watered. Plant them in small pots filled with light kitchen-garden mould, when they are well rooted, and place them in the shade till they have taken new root; then remove them to an open situation till the end of October, when they must be placed under shelter, in a hot-bed frame, where they may be protected from hard frost, and have as much free air as possible in mild weather; they will thrive better than if more tenderly treated.

2. Origanum Dictamnus; *Dittany of Crete* or *Candia.* Lower leaves tomentose; spikes nodding; stalks hairy, about nine inches high, of a purplish colour, sending out small branches from the sides by pairs. The whole plant has a piercing aromatic scent, and biting taste. The flowers are collected in loose leafy heads of a purple colour, and nodding; they are small, and the stamina stand out beyond the corolla. The fabulous qualities attributed to Dictamnus by the ancients, may be seen in Virgil, *En.* xii. v. 412. and in Cicero *de Natura Deorum;* the former is most elegantly translated by Dryden in his version of Virgil, and will not fail to please every English reader of taste. It flowers from June to August; and is a native of rocks in Crete.—To propagate this plant, set slips or cuttings in pots, in a shady border, covering them close with a bell or hand glass, and now and then refreshing them with a moderate quantity of water. In the following spring some of the plants may be shaken out of the pots, and planted in a warm border in a dry soil, where they will live through common winters; but being liable to be killed by severe frost, it will be prudent to reserve a few in pots, to be sheltered during the severity of winter. The leaves are kept by the druggists, and have been greatly celebrated for their efficacy in the cure of wounds. Whether they possess any particular virtues of that kind, we cannot pretend to determine; they are however good in nervous disorders, weakness of the stomach, and suppression of the menstrual discharge.

3. Origanum Sipyleum; *Dittany of Mount Sipylus.* Leaves ovate, acute, all smooth; spikes nodding. This has a perennial root, but an annual stalk. The root is composed of many slender woody fibres. The stalks are slender, and

of a purplish colour, terminated by slender oblong spikes of small purplish flowers, peeping out of their scaly covers.—Native of the Levant; and increased in the same way as the first and second species.

4. Origanum Tournefortii; *Dittany of Amorgos.* Spikes four-cornered; bractes roundish, very large; stems eight or nine inches high, glaucous, simple, or branched, commonly dividing into two spikes, or terminating in one only; each spike is fifteen or twenty lines long, and five or six wide, formed by four rows of scales, of a pale purple colour, oval, pointed, four or five lines long; sometimes they are pale green with purple borders; the flowers expand successively from the axils of these, nine or ten inches in length.—It flowers in August; and is a native of the island of Amorgos. Increased in the same way as the preceding species.

5. Origanum Creticum; *Cretan Marjoram.* Spikes aggregate, long, prismatic, straight; bractes membranaceous, twice as long as the calix; leaves ovate and hoary, with a strong aromatic scent. The flowers grow on long erect bunched spikes at the top of the stalks, having membranaceous bractes between, twice the length of the calix. The flowers are small and white, but, like those of Common Marjoram, they appear in July, but seldom perfect seed in England. This is said to be the true Dittany of Crete; but there has been so much confusion among different authors in distinguishing the species, that it is very difficult to determine.—This and the next species are increased by parting the roots in autumn, but must have a dry soil and a warm situation.

6. Origanum Smyrnæum; *Smyrna Marjoram.* Leaves ovate, acute, serrate; spikes heaped, umbellately fastigiate. This is a perennial plant, with several rod-like, woody, long stems, putting forth branchlets at intervals. The round airy spikes, collected into a broad-topped corymbose tuft, distinguish this plant. It exhales a very fragrant smell.—Propagated in the same way as the preceding species.

7. Origanum Heracleoticum; *Winter Sweet Marjoram.* Spikes long, peduncled, aggregate; bractes the length of the calices. Root perennial, from which arise many branching stalks a foot and half high, hairy, and inclining to a purplish colour; flowers in spikes, about two inches long, several arising together from the divisions of the stalks. It is chiefly cultivated for nosegays, because it comes sooner to flower than Sweet Marjoram. There is a variety with variegated leaves.—It grows naturally in Greece, and the warm parts of Europe. It is now commonly known by the name of Winter Sweet Marjoram, but was formerly called Pot Marjoram. It is hardy enough to thrive in the open air in England, in a dry soil, and is generally propagated by parting the roots in autumn.

8. Origanum Vulgar; *Common Marjoram.* Spikes roundish, panicled, conglomerate; bractes longer that the calix, ovate. Root perennial, creeping, horizontal, brown, tufted with numerous fibres; stem a foot high, sometimes nearly eighteen inches or two feet, upright, somewhat woody, a little downy, and often tinged with purple; branches opposite, upright, more tender than the stalk, in other respects similar; corolla pale red, hairy, the middle segment rather longer than the rest. The leaves vary in shape from ovate to ovate-lanceolate and ovate-cordate. There is a variety with white flowers, and light green stalks; and another with variegated leaves. It is an aromatic and ornamental plant, growing wild in thickets and hedges, chiefly in a calcareous soil, and flowering from the end of June through August. The dried leaves, used instead of tea, are exceedingly grateful; they are also used in fomentations. The essential oil is so acrid that it may be considered as a caustic, and is used for the same purposes by farriers; a little cotton moistened with it, and put into the hollow of an aching tooth, frequently relieves the pain. The country people use the tops to dye woollen cloth purple; and it also dyes linen of a reddish brown colour: for this purpose the linen is first macerated in alum-water, and dried; it is them soaked for two days in a decoction of the bark of the crab-tree; it is wrung out of this, boiled in a ley of ashes, and then suffered to boil in the decoction. According to the Swedish experiments, goats and sheep eat it; horses are not fond of it; and cattle reject it. It is an excellent medicine in nervous cases. The leaves and tops dried, and given in powder, are good in head-aches of that kind. The tops made into a conserve, are good for disorders of the stomach and bowels, such as flatulencies, and indigestion; and an infusion of the whole plant is serviceable in obstructions of the viscera, and against the jaundice.—Propagated by parting the roots.

9. Origanum Onites; *Pot Marjoram.* Spikes oblong, aggregate, hirsute; leaves cordate, tomentose. Stems perennial, woody, a foot and half high, dividing into many small branches: flowers small, white, just emerging out of their scaly covers.—Native of Sicily, about Syracuse. It may be increased by cuttings.

10. Origanum Syriacum; *Syrian Marjoram.* Spikes long, ternate, peduncled, villose; leaves ovate, villose; racemes from the axils; corymb terminating, brachiate, with longer branches.—Place of growth uncertain; Loureiro says it grows wild in Cochin-china. Increased by cuttings.

11. Origanum Maru. Spikes hirsute; leaves ovate, tomentose, sessile; stem purple, with a few villose hairs scattered over it; corolla purplish-red.—Native of Crete.

12. Origanum Marjorana; *Sweet* or *Knotted Marjoram.* Leaves oval, blunt; spikes roundish, compact, pubescent. Root biennial, brown, with many long tough fibres; stems numerous, woody, branched, a foot and half high; flowers small, white, appearing successively between the bracteal leaves, which are numerous. It begins to flower in July, at which time it is cut for use, and is then called Knotted Marjoram, from the flowers being collected into roundish close heads like knots.—It is thought to be the Amaracus of the ancients. Native of Portugal, and long cultivated in gardens. The leaves and tops have a pleasant smell, and a moderately warm, aromatic, bitterish taste. They yield a considerable quantity of essential oil, amounting, according to Beaumé, to fifteen ounces from one hundred and fifty pounds of the recent plant. The oil, on being kept long, assumes a solid form. The medicinal qualities of the plant agree with those of Wild Marjoram; but being much more fragrant, it is deemed more cephalic, and better adapted to diseased nerves, as it may be employed for the same purposes as Lavender. It is directed in the composition of Pulvis Sternutatoris, or Sneezing Powder, in the London and Edindurgh *Pharmacopeias*, on account of the agreeable odour which it gives to the Asarabacca, rather than to its errhine power, which is very inconsiderable. In its recent state, we are told that it has been successfully applied in schirrhous tumors of the breast; and Meyrick recommends a strong infusion of the leaves or young tops, as good for warming and strengthening the stomach, and relieving vertigoes, giddiness, head-ache, and other similar disorders. It may likewise be beneficially taken in suppressions of the menses, and other obstructions.—This plant is propagated by seeds, which are generally imported from the south of France, or from Italy, for they seldom ripen in England. Sow them on a warm border towards the end of March; and when the plants are about an inch high, transplant them into beds of rich earth, at six inches' distance

every way, watering them duly till they have taken new root; after which they require only to be kept clean from weeds.

Ornithogalum; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* petals six, lanceolate, upright below the middle, above it spreading, permanent, losing their colour. *Stamina:* filamenta six, upright, alternately widening at the base, shorter than the corolla; antheræ simple. *Pistil:* germen angular; style awl-shaped, permanent; stigma blunt. *Pericarp:* capsule roundish, angular, three-celled, three-valved. *Seeds:* many, roundish. *Observe.* The filamenta in some are flat and upright, the alternate ones trifid at top, the middle segment supporting the antheræ; in others the alternate filaments are simple. Essential Character. *Corolla:* six-petalled, upright, permanent, spreading above the middle. *Filamenta:* alternate, widening at the base.——The species are,

**With all the Stamina awl-shaped.*

1. Ornithogalum Uniflorum; *One-flowered Star of Bethlehem.* Scape two-leaved; peduncle one-flowered. The stem is about a span high, bearing two lanceolate leaves, nearly opposite; petals yellow above, green below, an inch long.—Native of Siberia. This species, with those that are referred to it, are cultivated for ornament in our gardens. They are hardy bulbs, to be propagated by offsets, which their roots generally produce in great plenty. The best time to transplant them is July or August, when their leaves are decayed; for if they are removed late in autumn, their fibres being shot out, they will be apt to suffer on being disturbed. They should have a light sandy soil, not over-dunged; and may be mixed with other bulbs in the borders of the pleasure-garden. They need not be transplanted oftener than every other year: for if taken up every year, they will not increase much; and if they are suffered to remain much longer unremoved, they will have so many offsets as to weaken the blowing roots. They may also be propagated from seeds; but the plants will not flower under three or four years.

2. Ornithogalum Niveum; *Snowy Star of Bethlehem.* Raceme few-flowered; petals lanceolate; leaves filiform, channelled; scape shorter that the leaves; peduncles scarcely half an inch long.—Native of the Cape. It flowers here in August, and, with all the species that are referred to it, may be propagated by offsets; but being too tender to thrive in the open air, the roots must be placed in pots filled with light earth, and in autumn placed under a hot-bed frame, where they may be screened from frost, and in mild weather enjoy the free air. In the beginning of July the leaves and stalks generally decay, and then the roots may be taken up, and laid in a dry cool place till the end of August, when they must be planted again.

3. Ornithogalum Umbellatum; *Common Star of Bethlehem.* Corymb few-flowered; peduncles longer than the bractes, the outer taller than the central ones; bulb solid, having smaller bulbs joining to it; scape upright, round, very smooth, a long span or a foot in height; petals white, with a broad green streak. This species is very improperly termed *Umbellatum*, as the flowers are in a most evident corymb or spike.—Native of the southern parts of Europe. In England it flowers in April and May, and is found in the closes about Streatham in Surry; near Relham in Cambridgeshire; in Christchurch meadows in Oxfordshire; and in some parts of Yorkshire. This plant will thrive in any shady situation.

4. Ornithogalum Luteum; *Yellow Star of Bethlehem.* Scape angular, two-leaved; peduncles umbelled, simple; root-leaves generally single, and longer than the stem. The Swedes eat the roots of this species in times of scarcity; indeed the roots of all the plants of this genus are nutritious and wholesome.—It flowers in April, and is a native of most parts of Europe, in woods, pastures, and moist sandy places. It is found in the meadows near Godalming in Surry; in the woods near Ashford Mill, and Fauler, in Oxfordshire; in a meadow adjoining to the copper mills, Derby; under Malham cove, near Doncaster in Yorkshire; and in Northumberland. It will grow readily in an open situation.

5. Ornithogalum Minimum; *Small Star of Bethlehem.* Scape angular, two-leaved; peduncles umbelled, branched. This very much resembles the preceding species, but the petals are more acute, and is readily known by its growing in a tuft.—Native of Sweden, Norway, Denmark, Germany, France, Switzerland, Hungary, and Italy, on the borders of fields. It requires a shady situation.

6. Ornithogalum Pyrenaicum; *Spiked Star of Bethlehem.* Raceme very long; petals linear, blunt; filamenta lanceolate, equal; style the length of the stamina. Stem naked, a foot and half or two feet high. The flowers have an agreeable scent, and appear in May; they are numerous, small, and greenish. When the seed vessels are formed, the fruit-stalks become erect, and approach to the stalk; the seeds ripen in August.—Native of pastures in some parts of Europe. In England it is found between Bath and Bradford, near Little Aspley; also between Bath and Warminster; three miles from Bristol, in the way to Bath; and near Queen Charlton in Somersetshire.

7. Ornithogalum Stachyodes; *Close-spiked Star of Bethlehem.* Raceme very long; petals lanceolate, oblong; filamenta broad lanceolate, alternate ones shorter by half. Height almost three feet; flowers from fifty to sixty in number, appearing in April.—Native of the south of Europe. For its culture and propagation, see the first species.

8. Ornithogalum Narbonense. Raceme oblong; filamenta lanceolate, membranaceous; peduncles and flowers spreading.—Native of the south of France, Spain, Italy, Germany, and Siberia.

9. Ornithogalum Latifolium; *Broad-leaved Star of Bethlehem.* Raceme very long; leaves lanceolate, ensiform. Bulb large; root-leaves several, broad, sword-shaped, spreading on the ground; stalk thick, strong, between two and three feet high, bearing a long spike of large white flowers upon long pedicels: one hundred flowers are said to have been counted on a single spike: they appear in June.—Native of Egypt and Arabia. For its propagation and culture, see the first species.

10. Ornithogalum Longibracteatum. Raceme very long: leaves lanceolate, ensiform.—Native of the Cape. See the second species.

11. Ornithogalum Comosum. Raceme very short; bractes lanceolate, the length of the flowers; petals blunt. Stems assurgent, clothed on the upper part with numerous milk-white flowers, of a medicated odour.

12. Ornithogalum Pyramidale; *Pyramidal Star of Bethlehem.* Raceme conical; flowers numerous, ascending; petals elliptical, oblong, flat; stamina lanceolate, equal; style very short. Bulb very large, oval, from which arise several long keeled leaves, of a dark green colour; in the middle of these spring up a naked stalk, nearly three feet high, terminated by a long conical spike of white flowers, on pretty long pedicels. It flowers in June, and the seeds ripen in August.—It grows naturally upon the hills in Spain and Portugal, but has been long cultivated in the English gardens by the name of Star of Bethlehem. See the first species.

13. Ornithogalum Unifolium; *One-leafed Star of Bethlehem.* Leaf radical, solitary, fleshy, oblong, ciliate; scape naked; raceme short.

** *With the alternate Stamina emarginate.*

14. Ornithogalum Arabicum; *Great-flowered Star of Bethlehem.* Corymb many-flowered; filamenta awl-shaped; corolla broad, bell-shaped: outer petals obsoletely three-toothed. Bulb large; leaves numerous, spreading, green; stem eighteen inches high, smooth, naked, slender; flowers the size of those of Narcissus, on long pedicels; petals white, smelling like those of Coriander seed. It flowers here in March and April.—Native of Arabia. For its propagation and culture, see the first species.

15. Ornithogalum Thyrsoides; *Spear-leaved Star of Bethlehem.* Corymbs many-flowered, raceme-form, alternate; filamenta forked; leaves lanceolate. Stem a foot high, of the thickness of a goose quill, and glaucous; raceme erect, nearly six inches long, thick, and elegantly thyrsiform; flowers snow-white, with a spot of brownish yellow at the base of each petal. They are slightly odorous. There are several varieties of this species.—Native of the Cape. For its propagation and culture, see the second species.

16. Ornithogalum Caudatum; *Long-spiked Star of Bethlehem.* Raceme very long; leaves lanceolate-linear; corollas spreading; stamina widened, the alternate ones wedge-form. The whole plant is smooth. It flowers from February to August.—Native of the Cape. See the second species.

17. Ornithogalum Nutans; *Drooping Star of Bethlehem.* Flowers directed one way, pendulous; nectary staminerous, bell-shaped. Root rather large, compressed, bulbous; stalk thick, succulent, a foot high, sustaining ten or twelve elegant flowers, of a greenish silvery-white colour, in a loose spike, each hanging on a footstalk an inch long.—It grows in abundance in the kingdom of Naples, and is now become very common in England. The roots propagate so fast by offsets and seeds, as to become troublesome in gardens, and grow plentifully when thrown out upon dunghills and waste places. It is treated in the same way as the first species.

18. Ornithogalum Capense. Leaves cordated, petioled; root irregular, tuberous, varying greatly in form and size; flower-stalks slender, naked, about a foot high, sustaining several small greenish white flowers, formed in a loose spike, standing upon long slender pedicels.—Native of the Cape. See the second species, for its culture and propagation.

19. Ornithogalum Crenulatum. Leaves oblong, blunt, ciliate; raceme upright.—Native of the Cape. See the second species.

20. Ornithogalum Rupestre. Leaves filiform, fleshy; flowers reflex.—Native of the Cape. See the second species.

21. Ornithogalum Ciliatum. Leaves ovate, acute, ciliate; raceme upright.—Native of the Cape. See the second species.

22. Ornithogalum Altissimum. Leaves oblong-elliptic; raceme very long; bractes bristle-shaped.—Native of the Cape. See the second species.

23. Ornithogalum Pilosum. Leaves linear-ensiform, ciliate; flowers racemed; peduncles curved inwards.—Native of the Cape. See the second species.

24. Ornithogalum Bulbiferum. Bulbs axillary; stem many-leaved, one-flowered.—Native of Siberia.

25. Ornithogalum Circinatum. Hoary with hairs; leaves linear, recurved, channelled; root-leaf solitary; stem-leaves three; stem three or four flowered; flowers larger and handsomer than those of the fourth species.—Native of dry spots near Astracan.

26. Ornithogalum Japonicum. Raceme spiked, cylindric, very long; scape striated; bulb conical, fleshy, white, a little larger than an hazel nut; flowers upright, opening one after another, in a raceme of a finger's length or upwards. It flowers in August and September.—Native of Japan.

27. Ornithogalum Sinense. Scape round, grooved; spike simple, long, upright. Bulb ovate, truncated, an inch and half long; flowers small, violet-coloured, on short petioles. It is nearly allied to the preceding species, but the flowers are by no means in a branched or racemed spike. The petals are neither distinct, nor very spreading.—Native of China, about Canton.

28. Ornithogalum Graminifolium. Leaves linear, entire, smooth; raceme spiked, erect.—Native of the Cape. See the second species.

29. Ornithogalum Albucoides. Leaves linear, channelled, smooth; raceme upright.—Native of the Cape. See the second species.

30. Ornithogalum Maculatum. Leaves lanceolate; flowers directed one way; the three outer petals shorter, dusky, spotted.—Native of the Cape. See the second species.

31. Ornithogalum Ovatum. Leaves ovate, entire, smooth; raceme ovate.—Native of the Cape. See the second species.

32. Ornithogalum Nanum. Leaves obovate; scape club-shaped; flowers spiked, aggregate, fleshy.—Native of the Cape. See the second species.

33. Ornithogalum Undulatum. Leaves ensiform, waved; scape subcylindrical; raceme comose, short.—Native of the Cape. See the second species.

34. Ornithogalum Punctatum. Leaves ensiform, channelled; scape cylindrical; raceme very long, comose; flowers remote.—Native of the Cape. See the second species.

35. Ornithogalum Aureum; *Golden Star of Bethlehem.* Leaves ovate-lanceolate, edged with white flowers, racemed, clustered; filamenta placed on an emarginate nectary. Stalk naked, from eight to twelve inches high, supporting many flowers, which spring from the axils of large, hollow, pointed bractes, and opening one after the other, keep the plant a considerable time in flower: the flowers are usually of a bright orange or gold colour; but sometimes paler; they appear in January and February.—Native of the Cape.

Ornithopus: a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* umbel simple; perianth one-leafed, tubular; mouth five-toothed, almost equal, permanent. *Corolla:* papilionaceous; standard obcordate, entire; wings ovate, straight, scarcely the size of the standard; keel compressed, very small. *Stamina:* filamenta diadelphous, (simple and nine-cleft;) antheræ simple. *Pistil:* germen linear; style bristle-shaped, ascending; stigma a terminating dot. *Pericarp:* legume awl-shaped, round, bowed, jointed, intercepted by isthmuses, separating by joints. *Seeds:* solitary, roundish. Essential Character. *Legume:* jointed, round, bowed.—The plants of this genus are annual, and perish soon after the seeds are ripe. They are propagated by sowing the seeds in the spring, upon a bed of light fresh earth, where they are to remain. When the plants come up, clear them from weeds, and thin them to about ten inches' distance. In June they will flower, and ripen seed in August.——The species are,

1. Ornithopus Perpusillas; *Common Bird's-foot.* Leaves pinnate; Legumes bowed inwards. Root annual, slender, with few, long, whitish, lateral fibres; stems several, trailing, from three to twelve inches in length, simple, pubescent; flowers small, one to five in a bunch, commonly two or three, terminating opposite to a leaf, on peduncles nearly of the same length with the leaf; corolla variegated with white, red, and yellow. It is an elegant little plant, deriving its name from the singular form of its seed-vessels, which resemble the claws of a bird. It varies much in size, and

sometimes has little knobs adhering to the roots, a circumstance common to leguminous plants. The flowers appear from May to September.—It is not uncommon on dry heaths, commons, and downs, on banks, and by road sides, especially in a gravelly or sandy soil.

2 Ornithopus Compressus; *Hairy Bird's Foot.* Leaves pinnate; legumes bowed back, compressed, wrinkled; bracte pinnate. The roots run deeply in the ground, sending out a few small fibres on the side; stalks about six inches long; flowers yellow, generally succeeded by two flat pods, not much more than an inch long, turned inwards like a bird's claws. It flowers in June and July.—Native of the south of Europe.

3. Ornithopus Durus; *Spiral Bird's Foot.* Stem suffruticose; leaves pinnate, glaucous, somewhat fleshy, shorter than the peduncle. Root whitish, round, gradually sharper, fibrous, an inch and half in length; flowers in a sort of umbel; corolla deep yellow. It flowers in June.—Native of the hills of Spain.

4. Ornithopus Scorpioides; *Purslane-leaved Bird's foot.* Leaves ternate, subsessile, the end leaflet very large. This has many smooth branching stalks, which rise nearly two feet high. The flowers stand upon slender peduncles; they are yellow, and succeeded by taper pods two inches long.—Native of the south of Europe; among corn, and on the borders of fields.

5. Ornithopus Tetraphyllus. Leaves in fours; flowers solitary, yellow. This plant rises to a foot high, erect, branched, and having twigs set with leaves alternately, on petioles three quarters of an inch long.—Native of Jamaica.

Orobanche; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, two or five cleft, erect, coloured, permanent. *Corolla:* one-petalled, ringent; tube inclined, wide, ventricose; border spreading; upper lip concave, open, emarginate; lower lip reflex, trifid, with an unequal margin; all the segments nearly equal. *Stamina:* filamenta four, awl-shaped, concealed beneath the upper lip, two of them longer; antheræ erect, converging, shorter than the border; nectary a gland at the base of the germen. *Pistil:* germen oblong; style simple, length and situation of the stamina; stigma semibifid, blunt, thickish, nodding. *Pericarp:* capsule ovate-oblong, acuminate, one-celled, two-valved. *Seeds:* numerous, very small; receptacles four, linear, lateral, adnate. *Observe,* each segment of the stigma is emarginate. Essential Character. *Calix:* bifid. *Corolla:* ringent. *Capsule:* one-celled, two-valved, many-seeded. A gland under the base of the germen.—The plants of this genus are not strictly parasites, for they derive sustenance and stability not only from the foster plants to which they are attached, but also in a great degree from the soils into which they send forth radical fibres. The want of leaves gives them a very ungraceful appearance, and their surface is in a greater or less degree beset with minute pellucid glanduliferous hairs, which project perpendicularly from the stems, and are occasionally found even upon the stamina and pistilla within the flowers. The stamina and pistilla have each an articulation at the distance of about two-thirds from their base, and are tipped with a globular sort of cup bearing a viscid gland, which seem intended to carry off secretions, and to answer the purposes of leaves in the offices of respiration. These plants are acotyledonous; for when a seed has attached itself to the roots of any living plant, to which it is suited by its nature to adhere, it swells into a pellucid scaly germen or bulb; and after throwing out around the point of adhesion several tender fibres, it pushes out at once into a perfect plant, without any lateral lobes or cotyledons; developing first the scales and then the stalk, with a head of flowers concealed by bractes, in form resembling a young head of Asparagus: the flowers afterwards expand in succession upwards, and the head becomes a spike. It is singular that these plants should attach themselves to shrubs and herbs of the class Diadelphia chiefly; and though commonly deemed baneful, there has yet been no decisive proof adduced. They have an acid astringent taste, and are rejected by all animals, except the minuter tribes of *cimices* and *thripses.*——The species are,

1. Orobanche Major; *Common Broom Rape.* Stem quite simple; corollas quadrifid, inflated; stamina naked below; stigma with two distant lobes; style pubescent above. Root oval, large, thick and fleshy, sometimes bulbous, adhering to the woody roots of Broom and Furze, "which (as Turner quaintly expresses it) it claspeth about with certain lyttel rootes on everye side lyke a dogge holdinge a bone in his mouthe." Stems several, upright, fleshy, hollow, channelled or angular, hairy, the thickness of a finger, from eight inches or a foot to eighteen inches in height, of a dusky yellow or rust colour tinged with purple, clothed with lanceolate scattered scales, which are much closer under the ground; flowers in spikes, sessile, appearing in June. The whole herb is of a dull purplish brown, the corolla only when fresh being a little more purple than the other parts.—Meyrick says, that a strong infusion of the plant is good against obstructions of the liver, and other viscera. It operates powerfully by urine, and is therefore efficacious in the jaundice, dropsies, gravel, &c. The powdered herb is an almost instantaneous remedy for the colic. Candied, or made into a syrup, it is recommended by some against hypochondriacal affections. Made into an ointment, it resolves and disperses hard tumors in any part of the body.

2. Orobanche Elatior; *Tall Broom Rape.* Stem quite simple; corolla quadrifid; stamina with glandular hairs below, stigma obcordate; style smooth above; flowers in a long spike, hairy, of a pale russet or fuillemort colour, with darker veins, and pale yellow stigmas.—It is found among Clover, but not in the first year; also on the borders of cornfields, by *Centaurea Scabiosa* and *Nigra,* and *Scabiosa Arvensis,* &c.—It flowers in July, and is not an uncommon plant, but has been confounded with the preceding; although, notwithstanding they are similar in general appearance, the difference is very discernible on a closer inspection. It has been found on Gamlingay heath, and between Cambridge and Granchester.

3. Orobanche Caryophyllacea; *Clove-scented Broom Rape.* Stem simple; corolla inflated, fringed, and curled; segments of the lower lip blunt and equal; stamina hirsute at the base within. Root bulbous, covered with scales; flowers solitary, alternate, sessile, erect, forming a loose spike, closer at top; sometimes there are two or three flowers together from a bracte, and about twenty-two in the whole spike. The whole plant has a strong smell of cloves, when fresh, from which it derives its specific name.—Native of pastures and hills, in various parts of Europe.

4. Orobanche Gracilis; *Slender Broom Rape.* Stem simple; corolla inflated; lower lip very short, with the segments obcordate, unequal, fringed, and curled; stamina and style with hairs standing out; corolla as large as that of the first species, but the upper lip is of a dark or purplish colour, and less fimbricated or crisped.—Native of hilly pastures near Genoa in Italy.

5. Orobanche Minor; *Small Broom Rape.* Stem quite simple; corollas quadrifid; stamina with glandular hairs

below; stigma retuse; style smooth above; flowers in spikes, whitish yellow, with purple veins, hairy, varying, of a full yellow, finally becoming rigid and ferruginous; the lower flower is often pedunculed. This plant is the only one of the species which grows in such situations, or in such abundance, as to be deemed a weed.—It is found in Clover, to whose roots it grows parasitically; and flowers in July and August.

6. Orobanche Americana; *American Broom Rape.* Stem quite simple, imbricate with leaves; corollas recurved; stamina standing out. The whole of this plant, which is a span high, with its fructification, is yellow.—It is said to be a native of Carolina, at the roots of trees and shrubs. Linneus received one very like it from Siberia, which could scarcely be distinguished, except by the blunt leaves.

7. Orobanche Cernua; *Drooping Broom Rape.* Stem quite simple; corollas recurved; bractes ovate, shorter than the corolla; stem almost naked.—Native of Spain.

8. Orobanche Purpurea; *Purple Broom Rape.* Stem simple and branched; corollas quadrifid; stamina spurred. The flowers are large; and the plant itself nearly a foot high, nearly leafless, downy, of a red purple when fresh, but turning black in drying.—Native of the Cape.

9. Orobanche Cœrulea; *Blue Broom Rape.* Stem commonly simple; corollas quinquefid; bractes by threes; calices tubular, half quadrifid. Root as in the other species, with fibres embracing the roots of different herbs; flowers in loose bluntish spikes, violet, with deeper coloured veins. This species is not always unbranched.—It grows among grass in pastures, on the borders of fields, in Switzerland, Austria, Germany, and the south of France.

10. Orobanche Ramosa; *Branched Broom Rape.* Stem branched; corollas quinquefid; bractes by threes: calices short, deeply quadrifid.—Root a solid bulb, elliptical; branches either immediately from the root, or alternate on the stem; stem and branches terminated by a thick sharp spike of sessile flowers, each having an ovate, lanceolate, somewhat carinated, bracteal scale.—Native of the south of France, Switzerland, Germany, and England, where it is found near Beccles and Bungay in Suffolk; in the isle of Sheppey, and near Feversham and Rochester in Kent; about Glastonbury; and in Devonshire and Hampshire; in hempfields near Wisbeach; and at Outwell in Norfolk.

11. Orobanche Tinctoria. Stem quite simple, imbricate; calices quinquefid, blunt; corollas quinquefid; lobes quite entire; spikes three inches long, thick; flowers alternate, contiguous, imbricated. It varies with blue and yellow corollas.—Native of Arabia and Barbary.

12. Orobanche Virginiana; *Virginian Broom Rape.* Stem branched; corollas four-toothed; flowers oblong, of an obsolete colour, covering the stem from the very root.—Native of Virginia.

13. Orobanche Uniflora; *One-flowered Broom Rape.* Stem one-flowered; calices naked; flowers small, consisting of six petals, five of which are red, and the sixth white, without any spots.—Native of Virginia. This plant does not attain to above the height of two or three inches.

14. Orobanche Æginetia. Stem one-flowered; flowers subspathaceous.—Native of Malabar.

Orobus; a genus of the class Diadelphia, order Decandria. —Generic Character. *Calix:* perianth one-leafed, tubular, blunt at the base; mouth oblique, five-toothed, very short; the three lower toothlets sharper, the two upper shorter, more deeply and bluntly divided, shrivelling. *Corolla:* papilionaceous; banner obcordate, reflex at the tip and sides, longer; wings two, oblong, almost the length of the banner, rising, converging; keel manifestly bifid below, acuminate, rising, with the edges converging, parallel, compressed; the bottom ventricose. *Stamina:* filamenta diadelphous, (simple and nine-cleft,) ascending; antheræ roundish. *Pistil:* germen cylindrical, compressed; style filiform, bent upwards, erect; stigma linear, pubescent on the inner side from the middle to the top. *Pericarp:* legume round, long, acuminate, and ascending at the end, one-celled, two-valved. *Seeds:* very many, roundish. Essential Character. *Calix:* blunt at the base; the upper teeth deeper and shorter. *Style:* linear.—All the species, except the four last, are hardy perennials, and several of them may be increased by parting their roots. The best time for doing this is in the autumn, that the plants may be well established before the spring; for as several of them begin to put out their stalks very early in the spring, so if they be then disturbed, it will either prevent their flowering, or cause their flowers to be very weak. They are also propagated by seeds, which should be sown in autumn, for if they be kept out of the ground till spring, many of the sorts will never grow, and those which do, seldom vegetate the same year. When the plants come up, they must be kept clean from weeds; and where they are too close together, they should be thinned; so as they may have room to grow till the autumn, when they should be transplanted into the places where they are designed to remain. If the roots be strong, they will flower very well the following spring; but those which are weak, will not flower till the following year. Such therefore may be planted in a shady border at four or five inches' distance, where they may grow one year to get strength, and then may be removed to the places where they are to remain. They will then only need to have the ground digged between them in winter, and in summer to keep them clean from weeds. ——The species are,

1. Orobus Lathyroides; *Upright Bitter Vetch.* Leaves conjugate, subsessile; stipule toothed. Root perennial; stalks three or four, branching about a foot high; flowers in close spikes, on short pedunculs.—Native of Siberia.

2. Orobus Hirsutus; *Hairy Bitter Vetch.* Leaves conjugate, petioled; stipules entire.—Native of Thrace.

3. Orobus Luteus; *Yellow Bitter Vetch.* Leavesp innate, ovate-oblong; stipules rounded, crescent-shaped, toothed. Root thick, often transverse, hard, with the fibres widely diffused; stem a foot high and more, straight, angular, striated, smooth; flowers in loose spikes, all directed one way, twelve or more in number; corolla pale yellow.—Native of Siberia, Switzerland, France, and Italy.

4. Orobus Vernus; *Spring Vitter Vetch.* Leaves pinnate, ovate; stipules semi-sagittate, quite entire; stem simple. Root perennial, creeping, not tuberous, woody, black, with many strong fibres; stem about a foot high, upright, unbranched, smooth, angular, twisted or elbowed at each insertion of the leaves; peduncles axillary, an inch and half long, terminated by a one-sided loose raceme of from six to eight or ten flowers; corollal arge and handsome, singular in the different shades of colour; the standard is wide and emarginate, the upper part of it is red, or purple with blood-red veins; the wings are blue, the keel is blue tinged with green; the colours change as the corolla advances, and become sky-blue when the corolla is ready to fall. Miller mentions a variety with pale flowers.—Native of mountainous woods in many parts of Europe.

5. Orobus Tuberosus; *Common Bitter Vetch,* or *Heath Pea.* Leaves pinnate, lanceolate; stipules semi-sagittate, quite entire; stem simple. Root perennial, consisting of tough fibres, swelling here and there into irregular tubercles;

flowers from two to four or five in a thin spike, on naked, slender, axillary peduncles; corolla beautiful reddish purple, turning blue as it goes off. The Highlanders of Scotland have great esteem for the tubercles of the root; they dry and chew them in general, to give a bitter relish to their liquor; and believe them to be good for most disorders of the thorax, and that the use of them enables to repel hunger and thirst for a long time. In Breadalbane and Ross-shire, they sometimes bruise and steep them in water, and make an agreeable fermented liquor with them. They have a sweet taste, something like the roots of liquorice, and when boiled are well-flavoured and nutritive, having served in times of scarcity as a substitute for bread. The Erse name for it is *Cor-meille;* the English call it *Wood-Pea*, *Heath-Pea*, and *Heath-Peaseling*. The flowers appear in May and June, and sometimes in April: the seed ripens in July.—Native of woods in most parts of Europe, and growing principally in a strong clayey soil.

6. Orobus Angustifolius; *Narrow-leaved Bitter Vetch.* Leaves two-paired, ensiform, subsessile; stipules subulate; stem simple. This has the habit of the preceding species, but the leaves are ensiform, lanceolate, with two or three pairs of opposite leaflets without any tendril; flowers few, yellow, in racemes.—Native of Siberia.

7. Orobus Albus; *White Bitter Vetch.* Leaves two-paired, ensiform, petioled; stipules simple; stem simple; roots tuberous, sessile.—Native of Austria.

8. Orobus Canescens; *Hoary Bitter Vetch.* Stem branched; leaves two-paired, linear; stipules semi-sagittate, awl-shaped; flowers white with a tinge of blue.—Native of barren pastures in the south of France, and the Levant.

9. Orobus Niger; *Black Bitter Vetch.* Stem branched; leaves six-paired, ovate, oblong. Root perennial, strong, woody; stems many, branching, two feet high, angular, having one pinnate leaf at each joint, composed of five or six small, oblong, oval, leaflets; flowers on very long axillary peduncles, having four, five, or six purple flowers at the top. It turns black in drying; and hence the trivial name.—It flowers from May to July, and is found in the woods and among the bushes in most parts of Europe, from Sweden to Greece, but not in Great Britain.

10. Orobus Pyrenaicus; *Pyrenean Bitter Vetch.* Stem branched; leaves two-paired, lanceolate, nerved; stipules somewhat thorny; flowers directed one way, pendulous.—Native of the south of Europe.

11. Orobus Sylvaticus; *Wood Bitter Vetch.* Stems decumbent, hirsute, branched; leaves pinnate, with numerous ovate-lanceolate hairy leaflets. From the roots arise numerous procumbent stems, much branched, and even, the younger shoots but slightly hairy; roots thick, woody, perennial, with a leguminous taste; flowers six, seven, or more, on the same common peduncle, pendulous, on slender pedicels, reddish on the outside, white with purple veins within. It flowers from May to July.—Native of France and England. It has been found in abundance about six miles from Penrith, on the way to Newcastle; and in Wales below Brecknock-hills, in the way to Caerdiff; and in Merionethshire, not far from Bala; and also in Denbighshire. In Scotland it has been met with on the Tweed, half-a-mile below the Buld; in the woods about Airly Castle; on the banks of the Clyde, near Lanark; and in the isle of Rum; it has also been seen near Ross-Trevor in Ireland.

12. Orobus Venetus; *Venetian Bitter Vetch.* Leaves pinnate, ovate, acute, four-paired; stem simple; root perennial. The flowers appear in March or April, and the seeds sometimes ripen in May.—Native of Italy.

13. Orobus Americanus; *American Bitter Vetch.* Leaves pinnate, linear-lanceolate, tomentose underneath. Stem very much branched, frutescent. The flowers grow in loose spikes at the end of the branches; they are of a pale purple colour, and are succeeded by smooth compressed pods, an inch and half long, each containing five or six roundish seeds.—Native of Jamaica. This, and the three following species, being natives of hot countries, are tender, and must be preserved in stoves, otherwise they will not live in England. They are propagated by seeds, which should be sown early in the spring in small pots filled with light rich earth, and plunged into a hot-bed of tanner's bark; observing frequently to moisten the earth, otherwise the seeds will not grow. When the plants come up, they should be carefully taken out of the pots, and each transplanted into separate small pots filled with rich earth, and then plunged again into the tan-bed, observing to shade them until they have taken root; after which they should have fresh air admitted to them every day in warm weather, and must be frequently watered: with this management, the plants will make a great progress. When any of the plants are grown too tall to remain in the hot-bed, they should be taken out and plunged into the bark-bed in the stove, where they may have room to grow, especially the thirteenth and fourteenth sorts; but the other two being of humbler growth, may be kept in the hot-bed until Michaelmas, when the nights begin to be cold; at which time they should be removed into the stove, and plunged into the bark-bed, where they must be treated as other tender exotic plants; by which method they may be preserved through the winter, and the following summer they will produce flowers. These plants being perennial, if they should not perfect their seeds, may be maintained for several years.

14. Orobus Argenteus; *Silvery Bitter Vetch.* Leaves pinnate, oblong-ovate, silky underneath. Stem erect, tomentose. The flowers are in terminating spikes; they are of a deep purple colour, and are succeeded by long woolly compressed pods, each containing four or five seeds.—Native of La Vera Cruz.

15. Orobus Procumbens; *Procumbent Bitter Vetch.* Leaves pinnate; outer leaflets larger, tomentose; stem procumbent. This is a low plant; the flowers come out in small bunches, standing upon short axillary peduncles; they are small, and of a bright purple colour, and are succeeded by compressed pods nearly two inches long, each having six or seven roundish compressed seeds.—Native of La Vera Cruz.

16. Orobus Coccineus; *Scarlet Bitter Vetch.* Leaves pinnate; leaflets linear, villose. Stem procumbent; flowers axillary and terminating; root woody, thick, sending out many slender stalks a foot and half long, trailing upon the ground: the flowers come out from the side and at the end of the stalks, three or four standing upon a short foot-stalk; they are small, and of a scarlet colour, and are succeeded by short taper pods, each containing three or four small roundish seeds.—Native of La Vera Cruz.

Orontium; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* spadix cylindrical quite simple, covered with florets; spathe none; perianth none, (unless the corolla be so called.) *Corolla:* petals six, peltate, roundish, angular, permanent. *Stamina:* filamenta six, very short, ensiform within each petal; antheræ twin, oblong. *Pistil:* germen roundish, depressed; style none; stigma roundish, bifid. *Pericarp:* follicle slender, immersed with the corolla in the spadix. *Seed:* single, round, fungose. Essential Character. *Spadix:* cylindrical, covered with florets. *Corolla:* six-petalled, naked. *Style:* none. *Follicles:* one-seeded.——The species are,

1. Orontium Aquaticum. Leaves lanceolate-ovate, floating, stalked. They are like those of the Lily of the Valley, green on the upper side, and covered with very minute hairs, so that they look like fine velvet. Spikes solitary, on long simple stalks, consisting of numerous, crowded, sessile, greenish-white flowers. Cattle, hogs, and deer, are very fond of the leaves in the spring, and they come out among the earliest. The Indians gather the seeds, and eat them when dried like peas, boiling them repeatedly in water before they are fit for use: they also boil them in milk or butter, and use them instead of bread; they call the plant, *Taw-kee.*—It flowers in June, and grows plentifully in the marshes near moist and low grounds, in Virginia, Canada, and other provinces of North America.

2. Orontium Japonicum. Leaves ensiform, veined; scape round, smooth, upright, from a finger to a palm in height; flowers at the top of the scape distinct, in an oblong spike, an inch in length. It differs from the preceding in having much longer leaves, attenuated below, and marked with several raised veins, and a shorter scape. It flowers in January.—Native of Japan.

Orpine. See *Sedum* and *Telephium.*

Ortegia; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, erect, with oval leaflets, membranaceous at the edge, permanent. *Corolla:* none. *Stamina:* filamenta three, awl-shaped, shorter than the calix; antheræ linear, compressed, shorter than the filamenta. *Pistil:* germen ovate, three-sided at the top; style filiform, almost the length of the calix; stigma blunt-headed. *Pericarp:* capsule ovate, three-cornered above, one-celled, three-valved at the top. *Seeds:* very many, extremely small, oblong, sharp at both ends. Essential Character. *Calix:* five-leaved. *Corolla:* none. *Capsule:* one-celled. *Seeds:* very many.——The species are,

1. Ortegia Hispanica; *Spanish Ortegia.* Stem branched; peduncles many-flowered. Root round, knobbed, descending, with branched fibres in the lower part; stems several, a foot high, thickened at the joints, which are red and distant; branches from bottom to top, decussately opposite, erect, subdivided; flowers herbaceous, small, so close as to appear to be glomerate, on very short peduncles. It flowers in July, and is a low, trailing, annual plant.—Native of Spain.

2. Ortegia Dichotoma; *Forked Ortegia.* Stem dichotomous; peduncles one flowered; root perennial; flowers in forked panicles, greenish.—Native of Italy.

Oryza; a genus of the class Hexandria, order Digynia.—Generic Character. *Calix:* glume one-flowered, two-valved, very small, acuminate, almost equal. *Corolla:* two-valved; valves boat-shaped, concave, compressed, the larger five-angled, awned; nectary two-leaved, flat, on one side of the germen, very small; leaflets narrow at the base, truncate at the top, caducous. *Stamina:* filamenta six, capillary, the length of the corolla; antheræ bifid at the base. *Pistil:* germen turbinate; styles two, capillary, reflex; stigmas club-shaped, feathered. *Pericarp:* none; corolla growing to the seed, oval-oblong, compressed; margins thin, two streaks on each side. *Seed:* single, large, oblong, blunt, compressed, with two streaks on each side. Essential Character. *Calix:* glume two-valved, one-flowered. *Corolla:* two-valved, almost equal, growing to the seed.——The only known species is,

1. Oryza Sativa; *Common Rice.* This plant has the culm from one to six feet in height, and it is annual, erect, simple, round, jointed; leaves subulate, linear, reflex, embracing, not fleshy; flowers in a terminating panicle; calicine leaflets lanceolate; valves of the corolla equal in length; the inner valve even, awnless; the outer twice as wide, four-grooved, hispid, awned; style single, two-parted.—*Rice* has a culm generally about four feet high, and is cut from six to eight months after planting: it is cultivated in marshes, and withers with drought, or in a small degree of saltness. The *Dry*, or *Mountain Rice*, has a culm three feet high; panicle spiked; spikes branching; fruit turgid, brownish-red, with shorter awns; it ripens and is cut in the fourth month from planting. It is cultivated in the hilly parts of Java, and in many of the Eastern islands, where no water but rain can come: it is planted in the beginning of the rainy season, and reaped in the beginning of the dry season. The natives call it *Paddy Gunung*, which signifies Mountain Rice. It is wholly unknown in the western parts of India, but is cultivated in Cochin-china, where it thrives in dry light soils, on the sides of hills, not requiring more moisture than the usual rains and dews (which are not plentiful at the season of its vegetation) supply.—The varieties of Rice, like those of other cultivated grain, are innumerable: they differ in the time of springing, growth, and maturity, in the sort of soil that they require, in the form and colour of the seed, and probably in other characters, if they were carefully examined. It is cultivated in great abundance all over India, where the country will admit of being flooded, in the southern provinces of China, Cochin-china, Cambodia, Siam, and Japan; in which last country it is very white, and of the best quality. In Carolina it has long been a staple commodity; owing, it is said, to a small bag of Paddy given as a present by a treasurer of the East India Company's to a Carolina trader. A Dutch vessel, from Madagascar, is also said to have imported Rice into the same province; and to this, the two different sorts are attributed. It has also been introduced into cultivation in the southern kingdoms of Europe, as Italy, Spain, the south of France, and within a few years into Hungary. Its native country is unknown.—*Propagation and Culture.* Much of the low grounds in the middle and southern provinces of China is appropriated to the culture of Rice; which constitutes the principal part of the food of all those who are not so indigent as to be forced to subsist on cheaper kinds of grain. A great proportion of the surface of the country is well adapted to the production of Rice. Many and great rivers run through the several provinces of China; the low grounds bordering on these rivers are annually inundated, by which means a rich mud or mucilage is brought upon their surface, that fertilizes the soil in the same manner as Egypt is by the overflowing of the Nile. After the mud has lain some days, preparations are made for planting Rice, by inclosing a small spot of ground by a bank of clay: the earth is ploughed up, and an upright harrow, with a row of wooden pins in the lower end, is drawn slightly over it by a buffalo. The grain, previously steeped in dung diluted with animal water, is then very thickly sown upon it. A thin sheet of water is immediatly brought over it, either by channels for drawing water from a higher ground, or from lower by means of a chain-pump, the use of which is as familiar as that of a hoe to every Chinese husbandman. In a few days the shoots appear above the water; and in that interval the remainder of the ground intended for cultivation, if stiff, is ploughed, the lumps broken by hoes, and the surface levelled by the harrow. As soon as the shoots have attained the height of six or seven inches, they are plucked up by the roots, the tops of the blades cut off, and each root is planted separately, sometimes in small furrows turned with the plough, and sometimes in holes made in rows by a drilling stick made for that purpose. The roots are

about a foot asunder. Water is brought over them a second time, for the convenience of irrigation; and to regulate its proportion, the Rice-fields are subdivided by narrow ridges of clay into small inclosures. Through a channel in each ridge, the water is conveyed at will to every subdivision. As the Rice approaches to maturity, the water by evaporation and absorption disappears entirely; and the crop, when ripe, covers dry ground. The first harvest in the southern provinces is towards the end of May or beginning of June. The instrument for reaping is a small-toothed sickle; the sheaves are placed regularly in frames, two of which, suspended at the extremities of a bamboo pole, are carried across the shoulders of a man to the place where it is to be thrashed. This operation is performed not only by a flail, or by the treading of cattle, but sometimes also by striking it against a plank set upon its edge, or by beating it against the side of a large tub scolloped for that purpose, the back and sides being much higher than the front, to prevent the grain from being dispersed. After being winnowed, it is carried to the granary. To remove the skin or husk of Rice, a large strong earthen vessel, or hollow stone, in form somewhat like that which is used elsewhere for filtering water, is fixed firmly in the ground, and the grain placed upon it is struck with a conical stone fixed to the extremity of a lever, and cleared (sometimes indeed imperfectly) from the husk. The same object is attained by passing the grain between two flat stones of a circular form, the upper of which turns round upon the other, but at such a distance from it as not to break the grain. The operation is performed on a larger scale in mills turned by water; the axis of the wheel carrying several arms, which raise levers by striking upon the end of them. Sometimes twenty of these levers are worked at once. The straw is cut chiefly into chaff, to serve as provender for the very few cattle employed in Chinese husbandry. The labour of the first crop being finished, the ground is immediately prepared for the reception of the fresh seeds. The first operation is to pull up the stubble, collect it in small heaps, burn it, and scatter the ashes upon the field. The former processes are afterwards renewed. The second crop is generally ripe late in October, or early in November. The grain is treated as before; but the stubble is no longer burnt, it is turned underneath the plough, and left to putrefy in the earth. This, with the slime brought upon the ground by inundation, are the only manures employed in the foreign cultivation of Rice: lands thus fertilized by the overflowing of the tide in the proximity of the sea, of rivers, or canals, are not appropriated solely to the production of Rice; they are found equally suitable for raising an excellent crop of Sugar-canes, with the precaution of keeping off the water after the young canes appear above the surface. Satisfied with two crops of Rice or one of Sugar in the year, the Chinese husbandman generally suffers the land to remain at rest till the following spring, when the same process is repeated. And thus, from generation to generation, successive crops are raised from the same soil, without the least idea of any necessity to let the earth lie fallow or idle for a year.—*Culture in England.* Sow the seeds on a hot-bed, and when the plants are come up, transplant them into pots filled with rich light earth, and placed in pans of water, which should be plunged into a hot-bed, renewing the water in proportion to the waste. Keep them in the stove all the summer, and towards the end of August they will produce the grain, which will ripen tolerably well, provided the autumn be favourable.

Osbeckia; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, permanent; border four-parted, deciduous; lobes oblong, acute, with a ciliate scalelet interposed between the lobes. *Corolla:* petals four, roundish, sessile, longer than the calix. *Stamina:* filamenta eight, filiform, short; antheræ oblong, erect, terminated by a filiform beak, the length of the anthera itself. *Pistil:* germen inferior, ovate, fastened to the calix below, terminated at top by four ciliate scales; style awl-shaped, the length of the stamina; stigma simple. *Pericarp:* capsule, roundish ovate, clothed with the truncated tube of the calix, subovate, four-celled, the cells gaping longitudinally at the top. *Seeds:* very many, roundish; receptacle crescent-shaped; according to Gærtner, wide, compressed. Essential Character. *Calix:* four-cleft, with the lobe separated by a ciliary scale; *Corolla:* four-petalled. *Stamina:* eight. *Antheræ:* beaked. *Capsule:* inferior, four-celled, surrounded by the truncated tube of the calix. Gærtner says,—the *Calix:* five-cleft, without interculated scales; corolla, five-petalled; stamina, ten; capsule five-celled.——The species are,

1. Osbeckia Chinensis. Leaves sessile; peduncles axillary, three-flowered, bracted. Root perennial, woody, sometimes consisting of a little knob with branches; stems quadrangular, the thickness of a packthread, seldom exceeding half a yard in length, generally branched, and sometimes like a little bush. The branches, which are quadrangular and somewhat hairy, are commonly opposite and single, if not divided; on the top are commonly two flowers surrounded with four leaves, two of which are short, but longer than the flowers. The leaves are opposite, each couple is an inch or more from the other, and the nearer to the flower the farther they are asunder; seeds small, in a microscope looking like little worms lying in a circular form. The Chinese call this plant *Komm Heyong-loua*, or *Feather of Gold Roses.* The whole plant is sold in the apothecaries' shops: they boil it with old *Kuli Tea*, and drink the decoction in colics; they bathe strains and swellings with the same decoction.—Native of the East Indies and China.

2. Osbeckia Zeylanica. Leaves petioled; peduncles axillary, one-flowered, naked. It greatly resembles the preceding.—Native of Ceylon.

Five other species of *Osbeckia*, with five-cleft flowers and ten stamens, were found by Dr. Afzelius, at Sierra Leone.

Osier. See *Salix.*

Osmites; a genus of the class Syngenesia, order Polygamia Frustranea.—Generic Character. *Calix:* common, imbricate, gibbous, with the inmost leaflets augmented at the tip. *Corolla:* compound, radiate; corollets hermaphrodite, several in the disk; female in the ray; proper of the hermaphrodite, tubular, five-cleft; of the female, ligulate, entire. *Stamina:* in the hermaphrodites; filamenta five, very short; antheræ cylindrical, tubular. *Pistil:* in the hermaphrodites; germen oblong; style filiform, the length of the corollet; stigma bifid: in the females, germen smaller; style filiform, the length of the corollet; stigma obsolete. *Pericarp:* none. *Calix:* unchanged. *Seeds:* in the hermaphrodites, solitary, oblong, with scarcely any pappus, or only margined; the pappus obsolete, and somewhat chaffy: in the females, rudimenta commonly abortive. *Receptacle:* chaffy. Essential Character. *Calix:* imbricate, scariose. *Corolla:* of the ray ligulate. *Down:* obsolete. *Receptacle:* chaffy.——The species are,

1. Osmites Bellidiastrum. Leaves linear, downy; stems scariose; branches woody, and thickish; flowers several in number, at the ends of the stem and branches; their disk is yellow, and the rays white.—Native of the Cape.

2. Osmites Camphorina. Leaves lanceolate, subserrate, toothed at the base; stems quite simple, with one pedunculed flower; ray of the corolla white; disk yellow; seeds small, ovate, attenuated each way to an obsolete edge, convex on one side, and grooved or striated flat on the other, pale. It has a very strong smell of camphor, and from that peculiarity derives both its names.—Native of the Cape.

3. Osmites Asteriscoides. Leaves lanceolate, dotted; stems leafy, thick, warted; flowers terminating, sessile. Gærtner is of opinion that this species differs so much from the preceding, that it might form a distinct genus.—Native of the Cape.

4. Osmites Calycina. Leaves lanceolate, naked; calices scariose; stem erect, proliferous, not thickened; branches a little pubescent; flowers terminating, solitary, sessile; corolla yellow.—Native of the Cape.

Osmunda; a genus of the class Cryptogamia, order Filices. —Generic Character. *Capsules:* distinct, dispersed in a raceme in such a manner as to look the same way, or else heaped on the back of the pinna or division of the frond, sessile, subglobular, opening transversely, without any ring. *Seeds:* very many, extremely minute. *Observe.* The species with capsules surrounded by an elastic ring, ought to be removed from this genus.—The *Osmund Royal*, and other European sorts, *Moonwort* excepted, will grow in a moist shady situation in gardens, but will not thrive well without bog earth.——The species are,

1. Osmunda Zeylanica. Scape cauline, solitary; fronds verticillate, lanceolate, undivided. Plant a foot high, with a naked stem, terminated commonly by seven petioled, undivided, lanceolate leaves, placed in a ring, and erect; among them rises a cylindrical pedunculed spike.—Native of Ceylon.

2. Osmunda Lunaria; *Moonwort.* Scape cauline, solitary; frond pinnate, solitary. Root fibrous; plant three, four, or five inches high, sometimes a little higher; the stem divides in the middle into two branches, one of which immediately puts forth leaflets on each side, the other supports a naked flowering raceme. The difficulty of meeting with this plant, which is not common, and lies concealed among grass, the singularity of its leaves, and its medical qualities, all conspire to make it sought after. The leaves dried, and given in powder, stop purgings and uterine hæmorrhages; and if they are bruised and applied to a cut, they will stop the bleeding, and heal it in a day or two. A decoction of the plant in red wine stops vomiting, inward bleeding, the whites, and most kinds of fluxes. It is also excellent for bruises, sprains, and ruptures; but it is mostly esteemed and made use of in liniments, oils, balsams, and salves, for green wounds, &c. This plant will not grow in any but a dry situation.—It is a native of most parts of Europe, found in dry pastures, flowering from May to July. In England it may be obtained near Linton and Chippenham in Cambridgeshire; Colchester in Essex; Bury in Suffolk; Stratton heath in Norfolk; Shotover hill, and North Leigh heath, in Oxfordshire; Scadbury park; Maidstone, Blackheath, and Chesselhurst common, in Kent; on the north side of Bredon hill; and near Stourbridge in Worcestershire; near Bath in Somersetshire; in various parts of Nottinghamshire and Lancashire; near Settle and Ingleton in Yorkshire; in the mountainous pastures of Westmoreland: in Scotland, on Ardgath hill to the north of Linlithgow; near Dundonald's, two miles from Little Loch Broom; on the western coast of Ross-shire; in the Isle of Skye: in Ireland, on the rising ground of a meadow 200 yards north of the second lock of Lagan canal.—There are several varieties of this curious little plant, with several leaves and spikes, and with several leaves cloven.

3. Osmunda Virginica. Scape cauline, solitary; frond superdecompound.—Native of North America.

4. Osmunda Ternata. Scape cauline, solitary; frond three-parted, subdecompound; root composed of numerous filiform fibres in bundles, with few fibrils.—It flowers in October and November, and is a native of Japan.

5. Osmunda Phyllitides. Scapes cauline, in pairs; frond pinnate; stem even.—Native of South America.

6. Osmunda Hirta. Scapes cauline, in pairs; frond pinnate; stem rough-haired; root a bundle of small fibres.—Found in the island of Martinico.

7. Osmunda Hirsuta. Scapes cauline, in pairs; frond pinnate, hirsute.—Native of Jamaica.

8. Osmunda Odianthifolia. Scapes cauline, in pairs; frond superdecompound.—Native of Jamaica.

9. Osmunda Verticillata. Scapes radicate; racemes verticillate; frond superdecompound.—Native of South America.

10. Osmunda Cervina. Scape radicate; frond pinnate; pinnas quite entire.—Native of South America.

11. Osmunda Bipinnata. Scape radicate; frond pinnate; pinnas pinnatifid.—Native of South America.

12. Osmunda Peltata. Shoot creeping; fructifications pedate, distinct, roundish-halved, entire, fronds dichotomous, with linear segments.—Native of Jamaica.

13. Osmunda Aurita. Scapes radicate; fronds bipinnate at bottom, pinnate at top; pinnas at the base, eared upwards, serrate, convex, shining.—Native of Jamaica.

14. Osmunda Filiculifolia. Scape radicate, panicled; frond superdecompound.—Found in South America.

15. Osmunda Regalis; *Osmund Royal*, or *Flowering Fern.* Fronds bipinnate, racemiferous at the top; root thick, externally fibrous, and covered with thin brown scales; plant from two to four feet high, of a pleasant and transparent green. A strong decoction of the roots is said to increase the urinary discharge, and is good in most obstructions of the viscera. It is not much regarded at present, but instances are not wanting in which it has cured the jaundice when taken at the beginning of the complaint.—It is the largest and handsomest of our British Ferns; and is found near Yarmouth and St. Kitt's, and in Newton bogs, near Norwich; in the New Forest; in Cornwall; in the isle of Anglesea; in several parts of Scotland; and in Kirkistown bog in Ireland, where it is called *Bog Onion.*

16. Osmunda Claytoniana; *Virginian Osmunda.* Fronds pinnate; pinnas pinnatifid, closely fructifying at top. It flowers in August, and is a native of North America.

17. Osmunda Capensis. Fronds pinnate; pinnas cordate-lanceolate, crenulate; scape formed of the fructifying frond. —Native of the Cape.

18. Osmunda Cinnamomea; *Woolly Osmunda.* Fronds pinnate; pinnas pinnatifid; scapes hirsute; racemes opposite, compound. It flowers in June.—Native of North America.

19. Osmunda Struthiopteris; *Bird's-nest* or *Russian Osmunda.* Fronds pinnate; pinnas pinnatifid, fructifying; scape distich. The fronds grow in a ring forming a hollow disk, affording an asylum for some of the amphibia, and the nests of birds, whence its name.—Native of the north of Europe.

20. Osmunda Lineata. Fronds pinnate, lanceolate, obliquely cordate at the base, entire at the edge; the fructifying pinnas crenulate, scaly in the middle.—Native of Jamaica.

21. Osmunda Polypodioides. Fronds lanceolate, pinnatifid; segments confluent, entire, ascending, with raised dots on the edge; scape lanceolate; pinnas remote.—Native of Jamaica.

22. Osmunda Spicans; *Rough Spleenwort.* Fronds lanceolate, pinnatifid; segments confluent, quite entire, parallel. Botanists are much divided concerning the genus of this plant: Dr. Withering and Hedwig determined it to belong to the genus Acrostichum; Dr. Smith refers it to the Blechnum; and Mr. Robson, to the Pteris genus; but wherever it may finally be fixed, it clearly cannot be an Osmunda.—Native of woods, and on moist heaths in several parts of Europe; and not uncommon in Great Britain. It produces its fructifications from July to September.

23. Osmunda Crispa; *Curled Osmunda,* or *Stone Fern.* Fructifications in lines along the under margin of the leaflets, which is rolled back upon them; after the discharge of the seeds, increasing in breadth, so as to cover the whole disk except the midrib. The fructifications are ripe in September.—Native of several parts of Europe, as Switzerland, Denmark, the south of France, Italy, and Britain, where it is found in the county of Rutland; on Cader Idris in Wales; at Shap near Kendal; and is common upon rocks, heaths, and old walls, in the northern counties, and in Scotland.

24. Osmunda Japonica. Frond bipinnate; pinnas cordate, lanceolate, serrate; stipe of the frond round, yellow, smooth.—Native of Japan, flowering in April and May.

25. Osmunda Lancea. Frond bipinnate; pinnas lanceolate, serrate.—Native of Japan, flowering in April and May.

26. Osmunda Discolor. Fronds pinnate; pinnas oblong, sharpish, entire, sessile, alternate, approximating.—Native of New Zealand.

27. Osmunda Procera. Fronds pinnate; pinnas remote, ovate-oblong, acuminate, serrate, sessile.—Native of New Zealand.

Osteospermum; a genus of the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common simple, hemispherical, many-leaved; leaflets awl-shaped, small. *Corolla:* compound rayed; corollets hermaphrodite, very many in the disk; females about ten in the ray: proper of the hermaphrodite, tubular, five-toothed, the length of the calix; of the female, ligulate, linear, three-toothed, very long. *Stamina:* in the hermaphrodites; filamenta five, capillary, very short; anthera cylindrical, tuberous. *Pistil:* in the hermaphrodites; germen very small; style filiform, scarcely the length of the stamina; stigma obsolete: in the females, germen globular; style filiform, the length of the stamina; stigma emarginate. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites none: in the females solitary, subglobular, coloured, at length hardened, inclosing a kernel of the same shape; pappus none. *Receptacle:* naked, flat. Essential Character *Calix:* simple, or in two rows, many-leaved, almost equal. *Seeds:* globular, coloured, bony: Gœrtner says, berried, or nucamentaceous; down none; receptacle naked.—These plants being too tender to live in the open air in England, are placed in the green-house in October, and may be treated in the same manner as Myrtles, and other hardy green-house plants, which require a large share of air in mild weather; and in the beginning of May, the plants may be removed into the open air, and placed in a sheltered situation during the summer season. They are propagated by cuttings, which may be planted in any of the summer months, upon a bed of light earth, and should be watered and shaded until they have taken root, which they will in five or six weeks, when they must be taken up and planted in pots; for if they be suffered to stand long, they will make strong vigorous shoots, and will be difficult to transplant afterwards, especially the second and third sorts; but there is not so much danger of the first, which is not so vigorous, nor so easy in taking root, as the other. During the summer season the pots should be frequently removed, to prevent the plants from rooting through the holes in the bottom of the pots into the ground, which they are very liable to, after continuing undisturbed. This causes them to shoot very luxuriantly; and on their being removed, these shoots, and sometimes the whole plants, will decay. As the first and second sorts are very thirsty plants, they should be supplied with plenty of water.——The species are,

1. Osteospermum Spinosum; *Prickly Osteospermum.* Spines branched. This is a low shrubby plant, which seldom rises above three feet high, and divides into many branches. The flowers are produced singly at the end of the shoots, they are starlike, yellow, have a pleasant smell, and appear in July and August.—Native of the Cape.

2. Osteospermum Pisiferum; *Smooth Osteospermum.* Leaves lanceolate, mucronate, subpetioled, smooth, serrate; branchlets angular, toothletted. Stem four or five feet high, dividing into many branches towards the top, which spread out flat on every side, and have a purplish bark. The flowers are yellow, standing single upon long axillary peduncles, which have a very few small leaves growing alternately their whole length.—Native of the Cape.

3. Osteospermum Moniliferum; *Poplar-leaved Osteospermum.* Leaves obovate, serrate, petioled, subdecurrent. Stem shrubby, seven or eight feet high, covered with a smooth gray bark, and dividing into several branches, at the ends of which the yellow flowers come forth in clusters.—Native of the Cape.

4. Osteospermum Ilicifolium; *Holm-leaved Osteospermum.* Leaves oblong, with angular teeth, rugged, half-embracing the stem; branches grooved.—Native of the Cape.

5. Osteospermum Ciliatum; *Fringe-leaved Osteospermum.* Leaves elliptic, lanceolate, crenate, ciliate.—Native of the Cape.

6. Osteospermum Junceum; *Reedy Osteospermum.* Leaves linear, acute, keeled, distant; panicle terminating. Stem five feet high, upright, stiff and straight, even.—Native of the Cape.

7. Osteospermum Triquetrum. Leaves linear, three-sided; stem suffruticose.—Native of the Cape.

8. Osteospermum Corymbosum. Leaves lanceolate, and smooth; flowers panicled. Stem upright, determinately branched, even, the thickness of a finger. The flowers yellow.—Native of the Cape.

9. Osteospermum Imbricatum. Leaves ovate, blunt, imbricate; stem determinately branched, two feet high, scarred.—Native of the Cape.

10. Osteospermum Herbaceum. Leaves ovate, subsessile spatulate, serrate; stem herbaceous.—Native of the Cape.

11. Osteospermum Niveum. Leaves ovate, petioled, toothed, woolly.—Native of the Cape.

12. Osteospermum Perfoliatum. Leaves ovate, petioled, angular, toothed, tomentose underneath; petioles perfoliate, embracing.—Native of the Cape.

13. Osteospermum Polygaloides. Leaves lanceolate, scattered, decurrent, smooth, quite entire; axils woolly; stalk about four feet high, dividing into many small branches, at the ends of which the flowers come out, standing singly on peduncles about an inch long.—Native of the Cape.

14. Osteospermum Calendulaceum. Leaves lanceolate, sessile, toothed, rugged; stem fleshy, lax.—Native of the Cape.

15. Osteospermum Arctotoides. Leaves lyrate, petioled; petioles eared at the base, half-embracing, tomentose.—Native of the Cape.

16. Osteospermum Rigidum. Leaves tooth-pinnatifid, hairy; branches unarmed.—Native of the Cape.

17. Osteospermum Cœruleum; *Blue-flowered Osteospermum.* Leaves pinnate; pinnas toothed. This is an undershrub, three feet high, with a strong smell; root woody, branching, fibrous; stem somewhat woody, erect, round, regularly branched, gray; flowers terminating, very loosely corymbed, peduncled, erect, blue, an inch wide.—Native of the Cape.

Oswego Tea. See *Monarda Didyma.*

Osyris; a genus of the class Dicœcia, order Triandria. Generic Character. *Male. Calix:* perianth one-leafed, trifid, turbinate; segments equal, ovate, acute. *Corolla:* none, except a little nectariferous rim. *Stamina:* filamenta three, very short; antheræ roundish, small. *Pistil:* an abortive rudiment. *Female. Calix:* perianth as in the male, superior, permanent, very small. *Corolla:* none, as in the male. *Pistil:* germen turbinate, inferior; style the length of the stamina; stigma three-parted, spreading. *Pericarp:* berry globular, one-celled, umbilicated. *Seeds:* bony, globular, filling the pericarp. Essential Character. *Male. Calix:* trifid. *Corolla:* none. *Female. Stigma:* roundish. *Drupe:* one-celled.——The species are,

1. Osyris Alba; *Poet's Cassia.* Leaves linear. This is a very low shrub, seldom rising above two feet high, having woody branches; flowers small, of a yellowish-green colour, succeeded by berries, which at first are green, and afterwards turn to a bright red colour, like those of Asparagus.—Native of France, Spain, Italy, Carniola, and Mount Libanus. It grows by the side of roads, and between rocks, and is with great difficulty transplanted into gardens, nor does it thrive after being removed; so that the only method to obtain this plant, is to sow the berries where they are to remain. These berries generally remain a year in the ground before the plants appear, and sometimes they will lie two or three years; so that the ground should not be disturbed under three years, if the plants do not come up sooner. The seeds must be procured from the places where the plants naturally grow, for those which have been brought into gardens never produce any, and it is with great difficulty they are preserved alive.

2. Osyris Japonica. Leaves ovate, floriferous; stem shrubby, tubercled, a fathom high.—The leaves are said to be eaten in Japan, where it is a native.

Othera; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, permanent, four-parted, with ovate segments. *Corolla:* petals four, ovate, blunt. *Stamina:* filamenta four, inserted at the very bottom of the petals, shorter by half than the corolla; antheræ twin, four-grooved. *Pistil:* germen superior, smooth; style none; stigma sessile. *Pericarp:* capsule? Essential Character. *Calix:* four-parted. *Petals:* four, ovate, flat. *Stigma:* sessile.——The only known species is,

1. Othera Japonica. Stem shrubby; branches round, striated, purple; leaves alternate, ovate, blunt, entire, smooth, coriaceous, spreading, an inch and half long; petioles semicylindric, smooth, a line in length; flowers axillary, aggregate, peduncled, white; peduncles half a line in length.—Native of Japan.

Othonna; a genus of the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common, quite simple, one-leafed, blunt at the base, sharp at the end, equal, divided into eight or twelve segments. *Corolla:* compound, rayed; corollets hermaphrodite, many in the disk; females in the ray, the same number with the segments of the calix, often eight, some say about ten. Proper of the hermaphrodite, tubular, five-toothed, scarcely longer than the calix; of the female, ligulate, lanceolate, longer than the calix, three-toothed, reflex. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; anthera cylindric, tubular, the length of the corollet. *Pistil:* in the hermaphrodites, germen oblong; style filiform, commonly longer than the stamina; stigma bifid, simple: in the females, germen oblong; style filiform, the same length as in the others; stigma reflex, larger. *Pericarp:* none; calix unchanged, permanent. *Seeds:* in the hermaphrodites none; in the females solitary, oblong, naked, or downy. *Receptacle:* naked, dotted; according to Gœrtner, somewhat villose in the middle, excavated about the edge. *Observe.* In some species the seeds are crowned with a down; in some the calix is divided beyond the middle; in others only toothed; but the figure is the same in all. Essential Character. *Calix:* one-leafed, multifid, subcylindrical. *Down:* almost none. *Receptacle:* naked.—The plants of this genus are preserved in the dry-stove, or even in the green-house, without any artificial warmth; it is sufficient to protect them well from frost; and in mild weather they must have a large portion of air, but be placed during the summer in a sheltered situation. They may be increased during the summer months by cuttings, planted upon an old hot-bed, and covered with glasses, shading them from the sun in the heat of the day; when they have taken root, plant each into a separate pot filled with soft loamy earth, and place them in the shade till they have taken new root; then remove them to a sheltered situation, where they may remain till autumn, treating them in the same way as the old plants.——The species are,

1. Othonna Cacalioides; *Tuberous Othonna,* or *African Ragwort.* Tuber denudated, finger-lobed, plant-bearing; scapes one-flowered; leaves obovate, toothletted.—Native of the Cape.

2. Othonna Bulbosa; *Bulbous African Ragwort.* Leaves oblong, naked, petioled; stem herbaceous; peduncles one-flowered, very long: from the centre of the leaves arise the footstalks of the flowers, which are five or six inches long, branching out into several smaller, each sustaining one yellow radiated flower shaped like the former. There are several varieties. It flowers in May and June.—Native of the Cape.

3. Othonna Denticulata; *Dentated African Ragwort.* Leaves oblong, toothletted, smooth, attenuated at the base, embracing; flowers panicled. It flowers in April and July. —Native of the Cape.

4. Othonna Tagetes. Leaves linear, pinnate, somewhat toothed; root annual; stem filiform, flexuose.—Native of the Cape.

5. Othonna Trifida. Leaves trifid, linear; flowers lateral, peduncled; stem shrubby, proliferous, spreading, dusky.—Native of the Cape.

6. Othonna Pectinata; *Wormwood-leaved African Ragwort.* Leaves pinnatifid; segments linear, parallel. This rises with a shrubby stalk, about the thickness of a man's thumb, two or three feet high, dividing into many branches, covered with a hoary down.—Native of the Cape.

7. Othonna Abrotanifolia; *Southernwood-leaved African Ragwort.* Leaves multifid, pinnate, linear, the joints of the stem villose. This has a low, shrubby, branching stalk: the leaves are thick, like those of Samphire, and are cut into many narrow segments; the flowers are produced on short peduncles at the ends of the branches; they are yellow, and the seeds are brown. It flowers from January to March.—Native of the Cape.

8. Othonna Athanasiæ. Leaves pinnate, filiform; calix hemispherical, twelve-toothed; stem shrubby; flowers rather

large, terminating from the dichotomy, on a one-flowered peduncle, twice as long as the leaves, and round; corolla yellow. The whole plant has a smell like turpentine.—Native of the Cape.

9. Othonna Ciliata. Leaves pinnatifid, sessile; pinnas ovate, ciliate; peduncles terminating, elongated, one-flowered. —Native of the Cape.

10. Othonna Pinnata. Leaves pinnatifid; pinnas lanceolate, quite entire, decurrent.—Native of the Cape.

11. Othonna Trifureata. Leaves trifid, pinnatifid; pinnas linear; peduncles lateral, fastigiate.—Native of the Cape.

12. Othonna Munita. Leaves pinnatifid, imbricated, curved inwards; pinnas three-sided, awl-shaped; stem dichotomous; peduncles from the divarications. This resembles the twenty-third species.—Native of the Cape.

13. Othonna Coronopifolia; *Buckthorn-leaved African Ragwort.* Lower leaves lanceolate, quite entire, upper sinuate, toothed. This rises with a shrubby stalk four or five feet high, dividing into several branches; the flowers are produced in loose umbels at the ends of the branches, and are yellow. It flowers from July to September.—Native of the Cape.

14. Othonna Cheirifolia; *Stock-leaved African Ragwort.* Leaves lanceolate, three-nerved, quite entire; stem suffruticose, creeping. This has a strong fibrous root, which shoots deep in the ground, and sends out many woody stems, which spread on every side.—Although it is a native of Africa, it will live in the open air, in a warm situation and a dry soil.

15. Othonna Crassifolia; *Thick-leaved African Ragwort.* Leaves lanceolate, quite entire, somewhat fleshy; stem upright. The flowers are produced towards the end of the branches, upon succulent peduncles about four inches long, each sustaining one yellow flower, which appears in August, and there is a succession till winter. Linneus remarks, that it resembles the preceding species.—Native of the Cape.

16. Othonna Parvifolia; *Small-flowered African Ragwort.* Leaves lanceolate, glaucous, embracing; flowers panicled; stem shrubby, two feet high, even; peduncles very long, even, stiff, straight.—Native of the Cape.

17. Othonna Tenuissima; *Fine-leaved African Ragwort.* Leaves filiform, fleshy; stem from a foot to two feet high and more, even.—Native of the Cape.

18. Othonna Linifolia; *Flax-leaved African Ragwort.* Herbaceous: leaves linear, margined, grassy; stem a span high, filiform, even, with one or two-flowered branches.—Native of the Cape.

19. Othonna Digitata; *Digitate-leaved African Ragwort.* Leaves oblong, undivided, or digitate-toothed; peduncles one-flowered; root bulbous.—Native of the Cape.

20. Othonna Lingua. Leaves ovate-lanceolate, half-embracing; root bulbous.—Native of the Cape.

21. Othonna Lateriflora; *Side-flowering African Ragwort.* Leaves lanceolate; flowers lateral; peduncles the length of the leaves. This is an upright shrub, with the stem the size of a swan's quill.—Native of the Cape.

22. Othonna Heterophylla. Root-leaves ovate, angular-toothed; stem-leaves lanceolate, almost entire; root bulbous. —Native of the Cape.

23. Othonna Ericoides; *Heathlike African Ragwort.* Stem dichotomous, imbricated; leaflets acerose; peduncle very long, solitary from the divarications; flower roundish, not large.—Native of the Cape.

24. Othonna Capillaris; *Capillary-branched African Ragwort.* Leaves lyrate; branches capillary; root fibrous, very slender; stems upright, a palm high, filiform, with the branches finally setaceous and capillaceous, even; flowers terminating, the size of hemp-seed, yellow.—Native of the Cape.

25. Othonna Virginia. Leaves wedged, gashed; stem shrubby, compound, erect, round.—Native of the Cape.

26. Othonna Frutescens; *Shrubby African Ragwort.* Leaves oval, somewhat toothed; stem frutescent. This is allied to the next species, from which it differs in having remote toothed leaves, not clustered, and quite entire, as in that; the stem without any hairy scars of the leaves; the ray eight-petalled, not five-petalled; the stem round, with smooth branches; the peduncles somewhat branched.— —Native of the Cape.

27. Othonna Arborescens; *Tree African Ragwort.* Leaves oblong, quite entire; stem arborescent, fleshy, with woolly scars.—Native of the Cape. This plant makes very slow progress here: in August it puts out young leaves, which it keeps all the winter; the heads of flowers appear about the end of November, and do not ripen till the middle or end of January; in spring the leaves gradually drop off, and the plant appears as if dead, till the succeeding autumn.

Ovieda; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, bell-shaped, acute, erect, broadish, short, permanent. *Corolla:* one-petalled, ringent, funnel-form, (trifid, according to Gærtner;) tube very long, narrow, subcylindric; border short, three-lobed, (or five-lobed,) almost equal. *Stamina:* filamenta four, thread-shaped, longer than the corolla; antheræ roundish. *Pistil:* germen superior, globular; style filiform, the length of the stamina; stigma bifid, acute. *Pericarp:* berry globular, one-celled, quadripartile, placed upon the calix, enlarged, bell-shaped, erect. *Seeds:* four, gibbous on one side, angular on the other, one-celled. Essential Character. *Calix:* five-cleft. *Corolla:* tube subcylindric, superior, very long; border three-lobed, or three-cleft. *Berry:* globular, one-celled, quadripartile, four-seeded.——The species are,

1. Ovieda Spinosa. Leaves oval, toothed. This is a shrub, with the flowers terminating, corymbed, subsessile among the terminating leaves; berries black: they ripen in May.—Native of South America and Hispaniola.

2. Ovieda Mitis. Leaves lanceolate, subrepand. This is a smooth unarmed shrub.—Native of Java.

Oxalis; a genus of the class Decandria, order Pentagynia. —Generic Character. *Calix:* perianth five-parted, acute, very short, permanent. *Corolla:* petals five, often cohering by the claws, erect, obtuse, emarginate; border spreading. *Stamina:* filamenta ten, capillary, (Jacquin says awl-shaped,) erect, the outer ones shorter; antheræ roundish, grooved. *Pistil:* germen five-cornered, superior; styles five, filiform, the length of the stamina; stigma blunt. *Pericarp:* capsule five-cornered, five-celled, ten-valved, (according to Jacquin, five-valved,) gaping at the corners longitudinally. *Seeds:* roundish, flying out, covered with a fleshy elastic aril. *Observe.* The capsule in some short, with solitary seeds; in others long, with many seeds: the filamenta of most coalesce at the base. Essential Character. *Calix:* five-parted. *Petals:* five, often connected at the base. *Capsule:* five-celled, five-cornered, opening at the corners. *Seeds:* arilled.—The European and North American sorts require no particular culture; the numerous species from the Cape of Good Hope must be planted in pots, which may be sheltered in the dry-stove or under a hot-bed frame in winter, where they may have as much free air as possible in mild weather. Most of them may be easily increased by offsets from the roots or bulbs which come out from the side of the stalks in great abundance. Those from the East and West

Indies, being more tender, require to be placed in a stove, kept to a moderate degree of warmth in winter; they are propagated by seeds sown in pots, plunged into a moderate hot-bed. When the plants come up, set them singly in pots filled with light sandy earth, and plunged into a fresh hot-bed, shading them from the sun until they have taken new root; after which, they must be treated in the same manner as other tender plants from the same countries.——The species are,

I. Division.—*With many-flowered Peduncles.*

* *Caulescent.*

1. Oxalis Pentantha. Stem upright; leaflets obovate; styles very short; root branched; corolla three times as long as the calix, bell-shaped, spreading very much at top, rounded, yellow.—Native of the Caraccas in South America.

2. Oxalis Rhombifolia. Stem upright; leaflets rhombed; styles very long; root branched.—Native of the Caraccas.

3. Oxalis Plumieri. Stem upright; leaflets oblong; peduncles umbelled; root branched; leaves alternate, ternate; peduncles axillary, solitary, spreading, about the length of the leaves.—Native of Guiana and the Caribbees.

4. Oxalis Barrelieri. Stem upright; leaflets oblong; peduncles bifid, racemed; styles equal; root branched, annual; leaves alternate, ternate; corolla twice as long as the calix, spreading very much at top, rounded, smooth, flesh-coloured.—Native of the Caraccas and Guiana. Jacquin observes, that when sown early in the spring, it grew luxuriantly in the stoves, produced seed abundantly, which from the elasticity of the capsule could not be collected but with great difficulty, and always perished in the winter; but that when it was sown later in the season it sometimes outlived the winter, and flowered in the following spring, yet was nevertheless in a very languid and feeble state.

5. Oxalis Rosea; *Rose-flowered Wood Sorrel.* Stem upright; leaflets obcordate; peduncles divided, racemed; root branched, annual; corolla twice as long as the calix, spreading very much at top, rounded, smooth, flesh-coloured. It flowers in the stove from May to October.—Native of the Caraccas and Guiana.

6. Oxalis Conorrhiza; *Conic-rooted Wood Sorrel.* Stem upright; leaflets obcordate; peduncles subbiflorous; root perennial, turbinate, putting forth capillary fibrils from the side, nearly an inch thick at top, ending in a sharp point at bottom, fleshy, dusky ash-coloured; corolla many times longer than the calix, very wide, rounded, yellow.—Native of Paraguay, in the vast plains to the northward of the river De La Plata.

7. Oxalis Crenata; *Notch-petalled Wood Sorrel.* Stem upright; leaflets obcordate; peduncles umbelliferous; petals crenate; root annual, fusiform, putting forth many fibrils, half an inch thick at top, pale green; corolla three times as long as the calix, bell-shaped, ten lines in diameter, yellow, with purple streaks on the inside. It seems to be wholly smooth.—Native of Peru, near Lima; it is cultivated in gardens, and used as Sorrel.

8. Oxalis Dillenii. Stem upright; leaflets obcordate; peduncles subumbelliferous; petals emarginate; root annual, branched, fibrous; corolla three times as long as the calix, yellow.—Native of Carolina.

9. Oxalis Stricta; *Upright Wood Sorrel.* Stem upright; leaflets obcordate; peduncles umbelliferous; petals quite entire; root perennial, creeping, round, putting out capillary fibres at the knots, branched; corolla twice or thrice as long as the calix, subcampanulate, yellow; claws upright; borders obovate, very obscurely emarginate, and very spreading. Swartz observes, that it varies with a stiffer and weaker stem, upright or declining, so that it is little more than a variety of the tenth species. Browne recommends it as a pleasant cooler and diuretic, and says that it was formerly administered in inflammatory cases, but has been little used since the more agreeable acid fruit-trees have been so generally cultivated in the West Indies. Mr. Miller remarks, that wherever this plant has been suffered to ripen its seeds, it has become a common weed. It flowers from June to October.—Native of N. America, Jamaica, and Piedmont.

10. Oxalis Corniculata; *Yellow Procumbent Wood Sorrel.* Stem prostrate, rooting; peduncles two-flowered; styles almost equal; root branched, fibrous, brownish, annual; leaves alternate, collected in a small number at the rooting part; corolla twice as long as the calix, subcampanulate, yellow; claws erect. It has been found near Dawlish in Devonshire, and is a native of Spain, Italy, Sicily, Greece, Austria, Switzerland, Japan, China, and Cochin-china. It flowers from May until October.

11. Oxalis Repens; *Creeping Wood Sorrel.* Stem prostrate, rooting; peduncles subbiflorous; styles nearly middling; root fibrous, slender, branched; leaves alternate, ternate; petiole jointed, and widening at the base, half round, villose, green, almost upright, half an inch or more; corolla three times as long as the calix, bell-shaped; claws upright, pale; borders obovate, rounded, spreading very much, yellow.—Native of the Cape of Good Hope, Madagascar, and Ceylon. Both these last are acid, and might supply the place of Oxalis Acetosella, if wanted for medical use.

** *Stipitated.*

12. Oxalis Megalorrhiza; *Great-rooted Wood Sorrel.* Leaves ternate, many-stumped; root perennial, round, an inch in diameter, about eight inches long, having several heads, divided below into branching legs full of clefts, covered with a double bark, the outer very thin, brownish ash-coloured; the inner two lines in thickness, red, watery, acrid; the substance of it is white, watery, acrid, having red fibres in it running from the centre to the circumference; corolla three times as long as the calix, bell-shaped, yellow, marked below with three red lines on each petal. This species is singular for the great size of the root, whence its trivial name. The heads of it resemble so many fruticose stems.—Native of the mountains of Peru.

13. Oxalis Sericea; *Silky Wood Sorrel.* Leaves ternate-tomentose; styles of middling length; bulb deep in the ground; stipe standing out, villose, having one or two scales about an inch in length, terminating in an umbel of leaves and scapes; peduncles from two to five, one-flowered, the middle ones shorter, drooping, each supported at the origin with two ovate rough-haired little bractes; corolla twice as large as the calix, yellow.—Native of the Cape.

14. Oxalis Violacea; *Violet-coloured Wood Sorrel.* Leaves ternate, obsoletely villose, numerous, fringed, on stalks about a span high; styles very short, interior; filamenta equal; flowers when closed drooping, when expanded upright. Bulb roundish, ovate, covered with a black coat, the size of a hazel nut, or less, very prolific, consisting of white fleshy scales, and having one or two red lines running through them; corolla three times as long as the calix, bell-shaped; claws yellowish; borders obovate, rounded, violet, purple, striated, spreading very much. The bulb sometimes produces fleshy roots, the thickness of a finger. It flowers in April and May: Jacquin says, throughout the summer.—Native of Virginia.

15. Oxalis Caprina; *Goat's-foot Wood Sorrel.* Leaves ternate, smooth, half-lobed; styles very short; interior fila-

menta unequal; flowers upright; bulb ovate, triangular, even. The next species is considered as the *Caprina*, in the generality of European gardens, and is probably the Caprina of Linneus, but this the Caprina of Thunberg and Jacquin. —Native of the Cape.

16. Oxalis Cernua; *Nodding Wood Sorrel.* Leaves ternate, smooth; styles very short; interior filamenta equal; flowers when closed drooping, when expanded upright; bulb acuminate-ovate, smooth, covered with a brown coat, the largest nine lines in length; corolla five times as long as the calix, bell-shaped; claws upright, pale yellow; borders very wide, obovate, rounded, spreading very much, yellow.—Native of the Cape.

17. Oxalis Dentata. Leaves ternate; petioles round; styles very long; bulb oblong, half an inch long, covered with a brown striated coat; stipe under ground from an inch in length, then rising above ground from one to four inches, round, smoothish, brownish purple, more slender than a pigeon's quill, having a few scales, commonly leafless, except that it has now and then a single leaf at top, almost upright, or declining, terminated by an umbel of leaves and flowers; corolla four times as long as the calix, of a violet purple colour, more pale on the outside, bell-shaped, spreading very much, and wide at the top. It flowers here in November.—Native of the Cape.

18. Oxalis Livida; *Livid Wood Sorrel.* Leaves ternate, smoothish; scapes two-flowered; styles middling; bulb ovate, half an inch long, covered with a brown striated coat; stipe partly subterraneous, and from one to three inches long, partly standing out two or three inches, round, nearly the thickness of a pigeon's quill, smooth, leafless, upright, terminating in an umbel of many leaves and fewer scapes, then elongated above this, and ending in another leafy umbel; corolla four times as long as the calix; claws erect, yellowish; borders rounded, wedge-shaped, spreading very much, flesh-coloured, with the back on one side somewhat villose. It flowers with us in October and Nov.—Native of the Cape.

19. Oxalis Compressa. Leaves ternate, hirsute underneath; petioles compressed; styles very long; stipes subterraneous, terminating in an umbel of leaves and scapes; corolla four times as long as the calix, bell-shaped, yellow; antheræ oblong, incumbent.—Native of the Cape.

20. Oxalis Burmanni; *Digitate-leaved Wood Sorrel.* Leaves digitate; bulb oblong; stipe subterraneous, terminating in an umbel of leaves and scapes; peduncles several, drooping till the flowers open, and then upright; calicine leaflets lanceolate, acute, erect; corolla five times as long as the calix, bell-shaped, yellow.—Native of the Cape.

21. Oxalis Sensitiva; *Sensitive Wood Sorrel.* Leaves pinnate; root fibrous, brown; stipe standing out, round, about the thickness of a pigeon's quill, from half an inch to six inches in height, obscurely jointed below, variegated with red, or brown, or green, filled with a white pith, terminating in a close umbel of leaves and flowers; corolla yellow. It is a very beautiful plant.—Native of Malabar, Ceylon, the Molucca Islands, and other parts of the East Indies, also of China and Cochin-china.

II. Division. *With one-flowered Peduncles.*

A. *Caulescent.*

22. Oxalis Macrostylis; *Long-styled Wood Sorrel.* Corollas coryophylleous; styles very long; bulb covered with a ferruginous shining coat, the size of a hazel nut; stem round, hirsute, purple, slender, somewhat branched, from six to nine inches high, almost upright; leaves subsessile, scattered, approximating, spreading very much, ternate. It flowers in Europe in October.—Native of the Cape.

23. Oxalis Tubiflora; *Tube-flowered Wood Sorrel.* Corollas caryophylleous; styles very short; filamenta unequal; bulb roundish, covered with a brownish coat, the size of a hazel nut, or larger; stem round, very hirsute, almost all leafy, sometimes, but seldom, having a single branchlet, half a foot high, almost upright, weak, about half the thickness of a pigeon's quill; leaves alternate, subsessile, spreading very much, ternate; peduncles not jointed at the base, axillary, solitary, round, hirsute, almost of the same thickness with the stem, two inches long, almost upright, alternate, pale, with little bractes, approximately alternate below the calix; styles smooth. It flowers in Europe in October and November. Willdenow unites this with the next species, Canescens, whose flower is of a more blueish purple. In both the styles are shorter than any of the stamens, and we venture (says an eminent botanist) to esteem them male plants; the 22nd species, Macrostylis, in which the styles rise above the stamens, being the female.—Native of the Cape.

24. Oxalis Canescens; *Hoary Wood Sorrel.* Corollas caryophylleous; styles very short; filamenta equal; bulb roundish or ovate, from the size of a pea to that of a hazel nut, with the scales a little loose, the outer ones brown, the inner whitish dotted with red; stem round, villose, half the thickness of a pigeon's quill, upright, half a foot, scaly at the base, either quite simple or branched from the axils of the leaves; peduncles not jointed at the base, axillary, solitary, erect, alternate, villose, pale green, half an inch long, with alternate approximating bractes below the calix; styles somewhat villose. It flowers in Europe in September and October.—Native of the Cape.

25. Oxalis Secunda. Corollas caryophylleous; styles of a middling length; bulb roundish, covered with a brown coat, larger than a hazel nut; stem round, the thickness of a pigeon's quill, extremely villose, brownish, only at bottom scaly and leafless, weak, about a foot high, upright for some inches, and then more or less reclining, from most of the leaves below the flowers increased by axillary erect branchlets, that grow half a foot in length, but scarcely ever bear flowers; leaves alternate, approximating on very short petioles, ternate. It flowers in Europe in October and November.—Native of the Cape.

26. Oxalis Hirta; *Hairy Wood Sorrel.* Corollas bell-shaped; styles very long; filamenta toothless, equal; bulb roundish, covered with a brown coat, the size of a hazel nut; stem round, slender, smooth at bottom, the rest villose, about eight inches in length, purplish brown, weak, flaccid, hence it is sometimes almost upright, sometimes decumbent or ascending, putting forth from the axils branchlets that seldom flower.—This species is remarkably rough in its wild state, but puts off much of its roughness when cultivated. It flowers in Europe in September and October.—Native of the Cape.

27. Oxalis Hirtella. Corollas bell-shaped; styles very long; filamenta toothletted, unequal; bulb roundish, with a brown skin, the size of a hazel nut; stem round, hirsute, commonly undivided, almost upright, weak, slender, greenish, about eight inches long, scaly at the base; leaves alternate, on very short petioles, ternate; peduncles not jointed at the base, axillary, solitary, alternate, roundish, villose, pale, flaccid, four inches long, having alternate bractes at top; styles hirsute, with simple hairs. In Europe it flowers in October and November.—Native of the Cape.

28. Oxalis Multiflora; *Many-flowered Wood Sorrel.* Corollas bell-shaped; styles very short; leaflets wedge shaped; bulb roundish, larger than a hazel nut, with a

brownish skin, composed of fleshy, very thick ovate-acuminate loose scales, forming as it were so many bulbs, hence lobed; stem round, almost upright, weak, somewhat villose, brownish-purple, from the thickness of a pigeon's quill to only half the size, from six inches to a foot in height, branched; leaves alternate, ternate, spreading very much, numerous, subsessile. It flowers in Europe in October and November. —Native of the Cape.

29. Oxalis Rubella. Corollas bell-shaped; styles middling; filamenta toothless; bulb ovate, acute, the size of a hazel-nut, with a ferruginous skin, loose; stem round, slender, somewhat hirsute, fleshy, weak, so that it is seldom really upright, scaly at the base, brownish-purple, about half a foot high. In Europe it flowers from October to December. —Native of the Cape.

30. Oxalis Rosacea. Corollas bell-shaped; styles middling: filamenta gibbosely toothletted; bulb roundish, or ovate, with a brown skin, less than a hazel-nut; stem round, slender, very hirsute, leafless to the middle, with minute wandering scales, sometimes, but very seldom, having an axillary flowering branchlet at top, weak, prostrate, rising up towards the top, from six inches to nearly a foot in height. This species is easily distinguished from all the rest, by having its leaves at the ends of the stem, and branches very closely collected into a form like a double rose, spreading, and very hoary. In Europe it flowers from September to November.—Native of the Cape.

31. Oxalis Disticha. Corollas bell-shaped; styles middling: petioles wingedly stipuled; bulb elongated, ovate, half an inch long or more, covered with a brown skin, putting forth a long thick fibre from the base; stem round, the thickness of a pigeon's quill, smooth, pale green, or dirty purple, half a foot long or more, almost upright at the base, then reclining and ascending, branched at the base, having distant scales at bottom, in other parts leafy, at all the scales and leaves jointed; peduncles jointed at the base, axillary, solitary, alternate, round, smooth, spreading, about the same length with the leaves, with opposite bractes directly under the calix. In Europe it flowers in December and January. — Native of the Cape.

32. Oxalis Tenella. Subcaulescent: corollas bell-shaped; filamenta toothless; leaflets obcordate; bulb ovate, acute, the size of a pea, often several inclosed in one brown skin; stem filiform, weak, an inch or a little more in length, round, appearing villose when magnified; peduncles axillary, solitary, jointed at the base, round, somewhat villose, upright, longer than the leaves, with bractes alternate at top. This, and the following species, connect the caulescent with the stemless Oxalides. In Europe it flowers in November and December.—Native of the Cape.

33. Oxalis Reptatrix. Subcaulescent: corollas bell-shaped; filamenta toothletted; leaflets roundish; bulb roundish, about the size of a hazel-nut, with a black hard skin, and commonly a double nucleus, putting forth a slender white jointed root, with a scale at each joint, having fibres on every side, here and there bulbiferous, creeping horizontally, from one to six inches in length; stem round, the thickness of a pigeon's quill, somewhat villose, upright, below the leaves scaly, and about an inch long, and then two or three inches more in length. In Europe it flowers in November and December.—Native of the Cape. This plant, Jacquin informs, as it runs along, puts forth bulbs in such abundance, as in a short time to fill the pots with plants; but that in four years, during which he had cultivated it, he had only a single flower; which is common in plants that are suffered to run at the roots.

B. *Stipitated.*

**With simple Leaves.*

34. Oxalis Lepida. Styles very long; bulb roundish, twice as large as a pea, half loose, with a soft compressile skin, lanuginose as it were, and of a brownish straw colour; stipe subterraneous, from a line to an inch in length, having a few scales at top, terminating in an umbel of a few leaves and flowers. This, and the next two species, are so alike in habit, leaves, bulbs, and flowers, that they can scarcely be distinguished.—Native of the Cape.

35. Oxalis Monophylla; *Simple-leaved Wood Sorrel.* Styles of middling length; bulb roundish; stipe short.—Native of the Cape.

36. Oxalis Rostrata; *Beaked Wood Sorrel.* Styles very short.—Native of the Cape.

** *With binate Leaves.*

37. Oxalis Crispa; *Curled Wood Sorrel.* Leaflets obovate, curled; bulb roundish, the size of a hazel-nut, with a brown skin; stipe partly subterraneous, about an inch long, and then standing out, shorter, scaly, leafless, brownish, the thickness of a pigeon's quill, upright, terminated by a thin umbel of leaves and flowers.—Native of the Cape.

38. Oxalis Asmina; *Asses'-eared Wood Sorrel.* Leaflets lanceolate; styles middling; bulb ovate, the size of a hazel-nut, with a brown skin; stipe partly subterraneous, about an inch long, scaly, then standing out, shorter, scaly, leafless, almost upright, terminated by an umbel of leaves and flowers; corolla four times as long as the calix; claws erect, yellow. The leaves are numerous, each pair on a winged obovate footstalk; the flowers are yellow, on stalks rather taller than the foliage.—Native of the Cape.

39. Oxalis Leporina. Leaflets lanceolate; styles very long; filamenta toothletted; bulb roundish, pale flesh colour, with a brown skin the size of a hazel-nut; stipe, the part under ground about an inch, above shorter, scaly, leafless, brownish, almost upright, terminated by a thin umbel of leaves and flowers. It derives its trivial name from the binate leaves resembling a hare's ear.—Native of the Cape.

40. Oxalis Lanceæfolia. Leaves binate and ternate; styles very long; filamenta toothless; bulb ovate, smaller than a hazel-nut, covered with a brown skin; stipe subterraneous, one or two inches long, almost the thickness of a pigeon's quill, having a few scales at top, and being bulb-bearing at bottom, terminating in an umbel of leaves and a few flowers.—Native of the Cape.

*** *With ternate Leaves.*

41. Oxalis Fabæfolia; *Bean-leaved Wood Sorrel.* Leaves obovate, flat; petioles winged; bulb roundish, with a brown skin, the size of a hazel-nut, often loose; stipe about an inch, partly under ground, partly above, scaly, leafless, nearly as thick as a reed at top, almost upright, terminated by a thick umbel of leaves and flowers.—Native of the Cape.

42. Oxalis Laburnifolia; *Laburnum-leaved Wood Sorrel.* The middle leaflet sublanceolate, the side ones obliquely oblong; styles very long; filamenta toothletted; bulb ovate, the size of a hazel-nut, with a blackish brown skin; stipe subterraneous, round, white, almost as thick as a pigeon's quill, about an inch in length, terminated by a thin umbel of leaves and flowers; leaves few, spreading.—Native of the Cape.

43. Oxalis Sanguinea; *Bloody-leaved Wood Sorrel.* The middle leaflet sublanceolate, the side ones obliquely oblong; styles middling; bulb ovate, minute, with a blackish brown skin, loose; stipe subterraneous, an inch long, of a dirty whitish colour, nearly as thick as a pigeon's quill, terminated by a thin umbel of leaves and flowers.—Native of the Cape.

44. Oxalis Minuta; *Small Wood Sorrel.* Leaflets lanceolate, acute; styles very long; filamenta toothless; stipe subterraneous, terminating in a poor umbel of leaves and flowers. —Native of the Cape.

45. Oxalis Ciliaris; *Ciliate-leaved Wood Sorrel.* Leaflets oblong, blunt; styles very long; filamenta toothless; bulb ovate, the size of a hazel-nut, with a black skin; stipe out of the ground, having a few scales, and one or two leaves, round, villose, often smooth at bottom, slender, weak, almost upright, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

46. Oxalis Arcuata; *Bending Wood Sorrel.* Leaflets linear, oblong, emarginate; styles very short; bulb ovate, slender, with a blackish brown skin, almost an inch in length; stipe out of ground, round, almost half the thickness of a pigeon's quill, having a few scales, but no leaves, hirsute, brownish green, three or four inches long, procumbent, terminated by an umbel of leaves and flowers; bractes linear, close to the flower.—Native of the Cape.

47. Oxalis Linearis; *Linear-leaved Wood Sorrel.* Filamenta toothless; styles very long; corollas caryophylleous; leaflets linear; bulb ovate, with a blackish brown skin, smaller than a hazel-nut; stipe out of the ground, round, slender, having a few scales, but seldom any leaves; sometimes a single leaflet at top, hirsute, brown, from four to seven inches long, at first upright, but by age becoming wholly procumbent, terminated by a closish umbel of leaves and flowers: and sometimes, but rarely, lengthened out into another umbel; leaves several, almost upright.—Native of the Cape.

48. Oxalis Gracilis; *Slender Wood Sorrel.* Filamenta toothless; styles very long; corollas bell-shaped; leaflets linear; bulb roundish, the size of a hazel-nut, covered with a brown skin, sometimes loose; stipe standing out, filiform, brownish, smooth, about half a foot long, very weak, and wholly prostrate, at bottom leafless, with a few scales; above having solitary leaves, and frequently an umbel, terminating in a thin umbel of flowers.—Native of the Cape.

49. Oxalis Reclinata; *Reclining Wood Sorrel.* Filamenta toothless; styles middling; leaflets linear; bulb roundish, often an inch in diameter, covered with a brown skin, loose; stipe standing out, a foot or eighteen inches long, round, smaller than a pigeon's quill, minutely and densely villose, brown, below the middle having a few scales, but no leaves; above the middle leafy, and sometimes having a branchlet; when young totally upright, but afterwards more or less reclining, and even entirely procumbent on account of its weakness, and the weight of the umbel, terminated by a dense loose umbel of leaves and flowers.—Native of the Cape.

50. Oxalis Mimata; *Vermilion Wood Sorrel.* Filamenta toothless; styles very short; leaflets linear; bulb roundish, the size of a hazel-nut, covered with a brown skin, sometimes loose; stipe above ground, filiform, brownish, smooth, from one to four inches long, very weak, and always prostrate from its extreme slenderness, mostly leafless, and having only a few minute scales, except at top, where there is a leaf, or one or two umbels; it is terminated only by a denser loose umbel of leaves and flowers.—Native of the Cape.

51. Oxalis Versicolor; *Striped-flowered Wood Sorrel.* Filamenta toothletted; styles very long; stem upright, hairy, generally simple; leaflets linear, callous on the under side at the tip; bulb ovate, half an inch long, covered with a black skin, within which are frequently several bulbs, hence when cultivated it has almost always many stipes; these are out of the ground, have a few scales on them, are round, slender, with a very few hairs scattered over them, are six inches long, sometimes leafless, sometimes having a single leaf at top; when young almost upright, but afterwards wholly procumbent, terminated by a dense umbel of leaves and flowers. Dr. Smith remarks, that the flowers are expanded in the sunshine only, and have no scent. It is an elegant species, conspicuous for the crimson margins of the white petals, which give the buds a spirally striped appearance.—Native of the Cape.

52. Oxalis Elongata. Filamenta toothletted; styles very short; petals emarginate; leaflets linear; bulb ovate, covered with a sooty skin, smaller than a hazel-nut; stipe appearing somewhat hirsute when covered with a glass, having a few scales, and often one or two leaves, extremely weak, so as to be wholly procumbent.—Native of the Cape.

53. Oxalis Tenuifolia; *Fine-leaved Wood Sorrel.* Filamenta toothletted; styles very short; petals quite entire; leaflets linear; bulb ovate, half the size of a hazel-nut, with a black skin; stipe almost upright, smooth, or somewhat villose, purple at bottom, from two to four inches long, scaly at the base, sometimes leafless, sometimes leafy all over, and even having barren branchlets; the umbel of leaves and flowers that terminates it, being elongated, but barren.—Native of the Cape.

54. Oxalis Polyphylla; *Many-leaved Wood Sorrel.* Filamenta gibbosely toothletted; styles middling; leaflets linear; bulb roundish, the size of a hazel-nut, or even of a walnut, covered with a brown skin, having ovate, acuminate, loose scales, flesh-coloured, or pale fleshy; stipe from half an inch to six inches in height; leaves very many.—Native of the Cape.

55. Oxalis Cuneata. Filamenta toothless; styles very long; leaflets wedge-shaped; bulb ovate, almost the size of a hazel-nut, with a blackish-brown skin, often loose at top; stipe standing out, round, scaly, brown, villose, procumbent, leafless, slender, two or three inches long, terminated by a dense umbel of leaves and flowers; leaves very many, spreading a little.—Native of the Cape.

56. Oxalis Cuneifolia. Filamenta toothless; styles very short; leaflets wedge-shaped; stipe about three inches long, frequently with a leaf or two on it; corolla five times as long as the calix, yellowish at bottom, the rest white; claws twice as long as the calix.—Native of the Cape.

57. Oxalis Glabra; *Smooth Wood Sorrel.* Filamenta toothletted; styles very long; stipe upright, smooth; leaflets oblong, or wedge-shaped, smooth; leaves several; scapes few, obscurely villose in the microscope, erect, an inch and half long, with alternate, lanceolate, acute, erect bractes at top.—Native of the Cape.

58. Oxalis Pusilla; *Dwarf Wood Sorrel.* Filamenta toothletted; style middling; leaflets wedge-shaped; bulb ovate, with a brown skin, less than a pea; stipe partly under, and partly above ground, from half an inch to two inches in length, filiform, smooth, the shorter upright, the larger procumbent, sometimes leafless, sometimes having a few leaves at the base, or at top, terminated by a denser umbel of leaves; corolla three times as long as the calix, bell-shaped. —Native of the Cape.

59. Oxalis Ambigua; *Doubtful Wood Sorrel.* Styles very long; leaflets unspotted, flat, the middle ones wedge-shaped, the side ones oblong, calicine leaflets equal; bulb oval, an inch long, covered with a black hard skin; stipes standing out, one or two inches in length, scaly, round, the thickness of a pigeon's quill, purplish, somewhat villose, erect, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

60. Oxalis Undulata; *Wave-leaved Wood Sorrel.* Styles very long; leaflets unspotted, waved, middle wedge-shaped,

lateral, oblong, one leaflet of the calix spatulate; bulb equal, an inch long, with a blackish brown skin; stipe from one to three inches long, almost upright, green or brownish, slightly pubescent, leafless, but having lanceolate, acuminate, ferruginous, ciliate scales, terminated by an umbel of leaves and flowers.—Native of the Cape.

61. Oxalis Fuscata. Styles very long; leaflets spotted on both sides; middle wedge-shaped, lateral, oblong; bulb oval, covered with a black hard skin, an inch long; stipe subterraneous, scaly above, an inch and more in length, terminated by a dense umbel of leaves and flowers, under which is another umbel or two which is less dense; corolla large; claws erect, twice as long as the calix, yellow within; borders white, with one side of the back flesh-coloured, rounded, wide, spreading very much; antheræ incumbent, yellow.—Native of the Cape.

62. Oxalis Glandulosa; *Glandular Wood Sorrel.* Styles middling; leaves and calices capitately ciliate; middle leaflet wedge-shaped; lateral ones oblong; bulb ovate, covered with a black hard skin, twice as large as a hazel-nut; stipe one or two, standing out, round, the thickness of a pigeon's quill, from one to three inches long, erect or procumbent, villose, scaly, leafless, purplish, weak, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

63. Oxalis Tricolor; *Three-coloured Wood Sorrel.* Styles middling; cilias simple; middle leaflet wedge-shaped, lateral ones oblong; bulb ovate, roundish, covered with a black skin, larger than a hazel-nut; stipe commonly wholly subterraneous, having one or two scales at top, short, leafless, round, almost as thick as a pigeon's quill, terminated by a dense umbel of leaves and flowers; leaves several, erect, or spreading.—Native of the Cape.

64. Oxalis Exaltata. Styles very short; leaflets dusky, spotted; middle wedge-shaped, lateral, oblong; scapes upright; bulb oval, an inch and half long, covered with a black hard skin; stipe partly under, partly above ground, scaly, round, about an inch high, upright, leafless, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

65. Oxalis Rubroflava. Styles very short; leaflets unspotted; middle wedge-shaped, lateral, oblong; scapes upright; bulbs subovate, with a blackish brown skin, less than an inch in length; stipe standing out, scaly, leafless, round, the thickness of a pigeon's quill, villose, almost upright, about an inch in length, terminated by a denser umbel of leaves and flowers.—Native of the Cape.

66. Oxalis Flaccida. Styles very short; leaflets unspotted; middle wedge-shaped, lateral oblong; scapes flaccid; bulb ovate-acuminate, with a blackish-brown skin, about an inch in length; stipe partly under, partly above ground, round, villose, the thickness of a pigeon's quill, green, procumbent, somewhat scaly, an inch and half long, leafless, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

67. Oxalis Variabilis; *Variable Wood Sorrel.* Styles very short; leaflets roundish, unspotted, very slightly emarginate; bulb ovate, with a blackish skin, half the size of a hazel-nut; stipe subterraneous, an inch long, terminated by an umbel of leaves and flowers; leaves several.—Native of the Cape.

68. Oxalis Grandiflora; *Great-flowered Wood Sorrel.* Styles very short; leaflets roundish, frequently blood-red underneath, scarcely emarginate; bulb ovate, acute, small, loose; stipe subterraneous, an inch and half long.—Native of the Cape.

69. Oxalis Convexula; *Convex-leaved Wood Sorrel.* Styles middling; filamenta toothless; leaflets roundish convex; bulb ovate, with a blackish brown skin, from the size of a hazel-nut to twice that size; stipe shortly subterraneous, then standing out, from three to five inches long, round, purple, smooth, without scales, the thickness of a pigeon's quill, or thicker, wholly procumbent, branched, brittle, with a central tough fibril, thickened at the tip, and from this terminated by a very close and elegant umbel of leaves and flowers, and finally dense, bulb-bearing from the same.—Native of the Cape.

70. Oxalis Purpurea; *Purple Wood Sorrel.* Styles middling; filamenta toothletted; petioles round; leaflets roundish, unspotted, ciliate; bulb ovate, loose, small, loosely inclosed in a skin, from three to six times the size of the bulb; stipe subterraneeous, from one to three inches long, round, slender, often bulbiferous, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

71. Oxalis Laxula. Styles middling; filamenta toothletted; petioles round; leaflets roundish, often purple underneath; bulb less than a hazel-nut, with a blackish brown skin; stipe about an inch long, terminated by a loose umbel; leaves several.—Native of the Cape.

72. Oxalis Breviscapa. Styles middling; filamenta toothletted; petioles thick, compressed; leaflets roundish; bulb oval, with a black hard skin, an inch long; stipe subterraneous, an inch in height, thick, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

73. Oxalis Rigidula. Styles very long; leaflets roundish, unspotted; bulb ovate, an inch long, covered with a blackish skin; stipe subterraneous, an inch in height, terminated by a stiffish umbel of leaves and scapes; leaves very many, spreading in a ring.—Native of the Cape.

74. Oxalis Speciosa; *Handsome Wood Sorrel.* Styles very long; leaflets roundish, unspotted above, underneath blood-red, and dotted with gold; bulb oval, with a blackish skin, less than an inch in length; spike subterraneous, an inch long, scaly at top, terminated by an umbel of leaves and flowers; leaves very many, spreading in a ring.—Native of the Cape.

75. Oxalis Saggillata. Styles very long; leaflets roundish, when adult livid underneath, all over, and above at the edges; bulb oval, with a blackish skin, less than an inch in length; stipe subterraneous, about an inch and half in height, terminated by an umbel of leaves and flowers; leaves several, in a ring.—Native of the Cape.

76. Oxalis Truncatula; *Truncate-leaved Wood Sorrel.* Styles very long; leaflets roundish. truncated; bulb ovate-roundish, with a black hard skin, almost the size of a walnut; stipe standing out, extremely short, terminated by an umbel of leaves and flowers.—Native of the Cape.

77. Oxalis Sulphurea; *Sulphur-coloured Wood Sorrel.* Styles very short; filamenta toothless; calix ciliate; leaflets obcordate; bulb oval, covered with a blackish hard skin, an inch and more in length; stipe subterraneous, about an inch long, terminated by a dense umbel of leaves and flowers; leaves very many, in a ring.—Native of the Cape.

78. Oxalis Natans; *Floating Wood Sorrel.* Styles very short; filamenta toothless; calix smooth at the edges; leaves floating; leaflets obcordate; stipe filiform, submersed, of an indeterminate length, leafless, but having a few scales, terminated by an umbel of leaves and flowers floating on the surface of the water; leaves several.—Native of the Cape.

79. Oxalis Strumosa. Styles very short; filamenta toothletted, equal; leaflets spotted on both sides; middle one obcordate; lateral ones roundish; bulb oval, or obovate, with a black hard skin; almost an inch in length; stipe subterraneous, one or two inches long, terminated by a dense

umbel of leaves and flowers; leaves numerous, villose on both sides, and at the edges; antheræ incumbent, yellow.—Native of the Cape.

80. Oxalis Luteola. Styles very short; filamenta toothletted, equal; leaflets obcordate, unspotted, and somewhat villose on both sides; bulb ovate, or oval, with a blackish skin, half the size of a hazel-nut; stipe subterraneous, about an inch long, terminated by a loose umbel of leaves and flowers.—Native of the Cape.

81. Oxalis Lanata; *Woolly Wood Sorrel.* Styles very short; filamenta gibbously toothletted, equal; leaflets obcordate, very hirsute on both sides; bulb deep in the ground; stipe standing out, closely woolly, with one or two woolly scales, about half an inch in length, terminating in an umbel of flowers and leaves; leaves several, small.—Native of the Cape.

82. Oxalis Punctata; *Dotted Wood Sorrel.* Styles very short; filamenta toothletted, unequal; leaflets underneath coloured and dotted with gold; middle one obcordate; lateral ones roundish; bulb deep in the ground; stipe standing out, closely woolly, with one or two woolly scales, about half an inch in length, terminating in an umbel of flowers and leaves; leaves several, small; germen hirsute.—Native of the Cape.

83. Oxalis Obtusa. Styles middling; filamenta toothletted, unequal; calicine leaflets rounded, blunt; leaflets obcordate; bulb deep in the ground; stipe standing out, villose, half an inch long, terminating in an umbel of leaves and flowers; leaves several; corolla four times as long as the calix, bell-shaped; claws erect, yellow; borders obovate, rounded, spreading very much, smooth, purple or variegated.—Native of the Cape.

84. Oxalis Fallax. Styles middling; filamenta toothletted, equal; leaflets obcordate; bulb ovate, or oval, with a blackish-brown skin, half the size of a hazel-nut; stipe subterraneous, about an inch in length, terminated by a loose umbel of leaves and flowers.—Native of the Cape.

85. Oxalis Marginata. Style middling; filamenta toothless, equal; leaflets obcordate; bulb oval, with a blackish brown hard skin, an inch long, stipe subterraneous, scarcely an inch in length, terminated by a dense umbel of leaves and flowers.—Native of the Cape.

86. Oxalis Pulchella; *Pretty Wood Sorrel.* Styles very long; filamenta toothless; leaflets obcordate; bulb oval or ovate, with a blackish-brown hard skin, about an inch in length; stipe subterraneous, very short, terminated by an umbel of leaves and flowers; leaves several, spreading in a ring; petiole jointed at the base, roundish, very hirsute, purple, one or two inches long; styles very hirsute, with most minutely capitate hairs.—Native of the Cape.

87. Oxalis Macrogonya. Styles very long; filamenta toothletted; stipe subterraneous; leaflets obcordate; bulb oval or ovate, with a blackish skin, half the size of a hazel-nut; stipe subterraneous, about an inch in length, terminated by a loose umbel of leaves and flowers.—Native of the Cape.

88. Oxalis Incarnata; *Flesh-coloured Wood Sorrel.* Styles very long; filamenta toothletted; stipe standing out very long, branched; leaflets obcordate; bulb in the young plant ovate, covered with a brown skin, twice the size of a pea. The root in the mature plant consists of several legs, slenderly fusiform, terminating in a long fibre, round, the thickness of a reed, and more, some inches in length, fleshy, brittle, pale, somewhat pellucid, and sweet.—Native of the Cape.

89. Oxalis Bifida; *Clover-leaved Wood Sorrel.* Styles very long; filamenta toothletted; stipe standing out, commonly branched; leaflets semibifid; corolla bell-shaped; leaves several, smooth; branches alternate, directed one way, striated, upright.—Native of the Cape.

90. Oxalis Longiflora; *Long-flowered Wood Sorrel.* Stipe standing out; leaflets semibifid; corolla caryophylleous; flower long.—Native of Virginia.

91. Oxalis Acetosella; *Common Wood Sorrel.* Stem none; stalks single-flowered; styles equal; leaflets obcordate, hairy; root perennial, branched, round, knobbed, creeping, with very fine fibrils on every side, partly white, partly red, having an ovate, acute, thick, rigid scale, like a tooth, at the knobs; stipe partly subterraneous, partly standing out, sometimes very little, sometimes several inches, then procumbent, and striking roots into the ground, toothletted at the knobs, like the root; round, somewhat hirsute, red, closely toothletted above with the permanent joints of decayed leaves. The flower-stalks are taller than the leaves, and each bear a delicate drooping inodorous flower, the petals of which are blush-coloured, veined with purple. Perennial, putting forth from its top several aggregate leaves and scapes.—Native of shady groves in most parts of Europe: frequent with us in the spring.—The London College directs a conserve of the leaves and petals of this plant to be made by beating them with thrice their weight of fine sugar and orange peel: this is called *Conserva Lujulæ.*—This plant is totally inodorous, but has a grateful taste, so that it is useful in salads, by supplying the place of vinegar. It is more agreeable than the common Sorrel, and tastes nearly like the juice of lemon, or the acid of tartar, and produces in a great measure the same medical effects, being esteemed refrigerant, antiscorbutic, and diuretic. It is recommended by Bergius in inflammatory, bilious, and putrid fevers. Its principal use, however, is to allay inordinate heat, and to quench thirst; for this purpose a pleasant whey may be obtained by boiling the plant in milk, which under certain circumstances may be preferable to the conserve directed by the London College, though an extremely grateful and useful medicine. Many have employed the root of this plant, probably on account of its beautiful red colour, rather than for its superior efficacy. An essential salt is prepared from this plant, known by the name of "Essential Salt of Lemons," and commonly used for taking iron-moulds and ink-stains out of linen. This salt is made from the expressed juice. Thunberg found that the Oxalis Cornua of the Cape of Good Hope, yields the salt in greater quantity than the Acetosella. This salt, when genuine, is composed of the vegetable alkali and a peculiar acid, which seems more allied to the acid of sugar than that of tartar. It is very rarely found genuine. What is sold under the name of "Essential Salt of Lemons," in this country, appears sometimes to consist of cream of tartar, with the addition of a small quantity of vitriolic acid. The active principle of the expressed juice, which reddens vegetable blues, coagulates milk, and instantly precipitates lime from its solutions, is superoxalat of potass, which is obtained crystallized from the juice, and sold in the shops under the name of "Essential Salt of Lemons." The same salt may be formed by cautiously dropping a solution of potass into a saturated solution of oxalic acid, obtained from sugar by the action of the nitric acid; the superoxalat precipitates as soon as the proper quantity of alkali is added. On the continent, this salt is prepared by the following process: the juice is allowed to subside after being slightly heated, and then clarified by adding to it water in which a smally portion of fine clay is suspended. This clarified juice is next boiled till a pellicle forms on its surface, and put aside for a month to crystallize: the operation being repeated until the whole of the salt is obtained,

when it is purified by a second crystallization. For taking out spots in linen, the stained part is dipped in water, sprinkled with a little of the salt powdered, then rubbed on a pewter plate, after which the spot is washed out with warm water.—Dr. Beddoes informs us, that the leaves and stalks wrapped up in a cabbage-leaf, and macerated in warm ashes until reduced to a pulp, have been successfully applied to scrofulous ulcers. This poultice should remain on the sore for twenty-four hours, and be repeated four times. Afterwards the ulcer is to be dressed with a poultice made of the roots of the Spiræa Ulmaria, (which see,) bruised and mixed up with the scum of sour buttermilk. There is no doubt that some of the foreign species may be superior to this in the same way. Twenty pounds of the leaves of our Wood Sorrel, fresh, yield six pounds of juice, from which two ounces, two drachms, and one scruple, of salt, have been obtained.—A variety is found, distinguished by being a less plant, flowering later, and having purple flowers. It occurs between Owram and Halifax in Yorkshire. Linneus observes, that the leaflets of the Common Wood Sorrel are erect in wet, and hang down in dry weather; and Villars remarks, that it has the leaves of Trefoil, the taste of Sorrel, and the flower of Geranium; from which last genus Jussieu distinguishes it by the number of the styles, the form of the capsule, and manner of its opening, its straight corcle or heart, without any perisperm or albumen.—This plant is called Wood Sour, Sour Trefoil, Stubwort, Sorrel du Bois, and Pain d'Coucou. If the roots be planted in a moist shady border, they will thrive and multiply, and, if kept clean from weeds, will require no other care. If the seeds of the other sorts are sown in an open border, the plants will rise freely; and if permitted to scatter, there will be a plentiful supply.

**** *With digitated Leaves.*

92. Oxalis Lupinifolia; *Lupin-leaved Wood Sorrel.* Style very short; calix smooth; leaflets flat; bulb ovate, acute, often loose, covered with a brownish skin; stipe subterraneous, two inches or more in length, terminated by an umbel of leaves and flowers; leaves several, quite smooth, digitated, spreading out wide in a ring.—Native of the Cape.

93. Oxalis Flava: *Narrow-leaved Wood Sorrel.* Styles very short; calix capitately ciliate; leaflets channelled, converging; bulb roundish, the size of a hazel nut, covered with a brown skin; stipe standing out, scaly, smooth, the size of a pigeon's quill, thickened above, purple, leafless, almost upright, but through weakness frequently prostrate, from half an inch to three inches in length, terminating in an umbel of leaves and flowers.—Native of the Cape.

94. Oxalis Flabellifolia; *Fan-leaved Wood Sorrel.* Styles of middling length; leaflets linear; bulb ovate-roundish, covered with a brown skin, the size of a hazel-nut, commonly loose; stipe subterraneous, standing out above, and furnished there with large imbricate scales, about an inch in length, the thickness of a reed, smooth, round, terminated by an umbel of leaves and flowers.—Native of the Cape.

95. Oxalis Pectinata. Styles very long; leaflets smooth; bulb ovate, less than a hazel-nut, covered with a brown skin, loose, putting forth a long thick fibre from its base; stipe partly under, partly above ground, about an inch and half in length, scaly at top, almost upright, round, thicker than a pigeon's quill, smooth, purple, terminated by an umbel of leaves and flowers; leaves several, almost upright.—Native of the Cape.

96. Oxalis Tomentosa. Styles very long; leaflets very hirsute underneath; bulb oval, with a brown skin, less than a hazel-nut, growing very deep in the ground; stipe subterraneous, two or three inches long, terminated by an umbel of flowers and leaves.—Native of the Cape.

97. Oxalis Lyoni. Plant of a silken hairy appearance; stem branchy, decumbent; peduncles biflorous, longer than the petioles; leaves ternate, bilobe-obcordate; segments rounded, divaricate; petals cuneated; siliques tomentose, as long again as the lanceolated calix; flowers yellow.—Native of Cumberland island, Georgia.

Ox-Eye. See *Buphthalmum.*

Ox-Lip. See *Primula.*

Ox-Tongue. See *Picris.*

Oxybaphus; a genus of the class Triandria, order Monogynia. Essential Character. *Calix:* five-cleft, bell-shaped. *Corolla:* funnel-shaped. *Nut:* five-cornered, one-seeded, surrounded by the unfolded permanent calix.——The species (all natives of South America) are,

1. Oxybaphus Viscosus; *Viscid Umbrella-wort.* Downy and viscid: leaves heart-shaped; panicle racemose; stamens larger than the corolla.

2. Oxybaphus Glabrifolius. Leaves heart-shaped, glaucous, smooth; panicle corymbose; flowers in terminal tufts; stamens shorter than the corolla.

3. Oxybaphus Ovatus. Hairy and viscid: leaves ovate; flower-stalks terminal, forked; stem erect; stamens nearly as long as the corolla.

4. Oxybaphus Prostratus. Leaves ovate or heart-shaped, downy; flowers axillary and terminal, somewhat corymbose; stem prostrate.

5. Oxybaphus Expansus. Leaves ovate, smooth; flower-stalks terminal, forked; stamens as long as the corolla; stem erect.

6. Oxybaphus Aggregatus. Leaves lanceolate; flower-stalks axillary, solitary; calix with about three flowers.—The plants of this genus have an herbaceous, branched, round stem; and the herbage is mostly viscid and downy, and of a disagreeable odour.

Ozophyllum; a genus of the class Monadelphia, order Pentandria.—Generic Character. *Calix:* perianth one-leafed, five-toothed, acute, very small. *Corolla:* petals five, with long claws converging in form of a tube; borders oblong, blunt, spreading. *Stamina:* filamenta cylindrical, sheathing the style, five-toothed at top; antheræ five, oblong, erect. *Pistil:* germen five-lobed, surrounded by a gland; style filiform, higher than the corolla; stigma capitate. *Pericarp:* five-celled. Essential Character. One-styled. *Calix:* five-toothed; petals five, long. *Filamenta:* sheathing the style, five-toothed at top; teeth antheriferous. *Stigma:* one. *Capsule:* five-celled.——The only known species is,

1. Ozophyllum Fœtidum. This is a shrub of ten feet high or more, and often four or six inches in diameter. The bark is green and smooth, the wood white, tender, and fragile; the branches twiggy, and garnished with alternate leaves; each leaf is digitated, having three large lobes, and growing on a foot-stalk of five or six inches long. When bruised, they emit a disagreeable smell, much resembling that of the Stramonium. The flowers are terminal, corymbose, and white.—Native of the forests of Guiana.

PADDOCK Pipe. See *Equisetum Palustre.*

Pæderia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, five-toothed, permanent. *Corolla:* one-petalled, funnel-form, hirsute within; border five-parted, small. *Stamina:* filamenta five, awl-shaped, very short, from the middle of the tube; antheræ oblong, shorter than the corolla. *Pistil:* germen roundish; style capillary, bifid, the length of the corolla; stigmas simple. *Pericarp:* berry brittle, ovate, inflated. *Seeds:* two, ovate. Essential Character. Contorted: *Berry:* inflated, brittle, two-seeded. *Style:* bifid. ——The species are,

1. Pæderia Fœtida; *Stinking Opal-berry.* Stamina included; stem twining, filiform, smooth, and even; leaves opposite, petioled, cordate, acuminate, quite entire, nerved, spreading a little, paler underneath, an inch long, very smooth, and even; flowers axillary, in brachiate panicles, coming out successively; the calix is often seven-leaved, and the corolla seven-cleft: sometimes the calix is six-leaved; it is now and then found with seven stamina. The plant turns black in drying, and when fresh has a very unpleasant smell. It varies with wider shorter leaves, and with narrower longer leaves.—Native of the East Indies and Japan.

2. Pæderia Fragrans; *Fragrant Opal-berry.* Stamina standing out. This differs from the preceding, chiefly in having wider, ovate, acuminate leaves, many-flowered cymes, and the segments of the corolla narrower and sharper, besides the distinction pointed out in the specific character. —Native of the island of Mauritius.

Pæderota; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted; leaflets linear, equal, spreading, permanent. *Corolla:* one-petalled, somewhat wheel-shaped, four-cleft, blunt, upper lobe wider, generally emarginate. *Stamina:* filamenta two, filiform, ascending, shorter than the corolla; antheræ converging, ovate, acute, two-valved. *Pistil:* germen ovate; style awl-shaped, bent down, the length of the stamina, permanent. *Pericarp:* capsule ovate, longer than the calix, two-celled, opening at top. *Seeds:* very many, roundish. *Observe.* It is allied to *Veronica,* but differs in having a five-parted calix. Essential Character. *Corolla:* four-cleft. *Calix:* five-parted. *Capsule:* two-celled.——The species are,

1. Pæderota Ageria. Leaves ovate-acuminate; helmet of the corollas bifid. This differs from the next species in having simple stems, the lower leaves alternate, drier, more wrinkled, and not at all shining; the helmet bifid and entire, ascending.—Native of Italy and Carniola.

2. Pæderota Bonarota. Leaves roundish, ovate; helmet of the corollas entire; root branched, fibrous, perennial; stems round, simple, villose, erect. Scopoli has given eight varieties.—Native of Austria, Carniola, and Italy.

3. Pæderota Minima. Leaves oblong, entire, opposite; flowers axillary, opposite; teeth of the calices hirsute within; stems an inch and half high, seldom branched, rooting at the base.—Native of the East Indies.

Pæonia; a genus of the class Polyandria, order Digynia. —Generic Character. *Calix:* perianth five-leaved, small, permanent; leaflets roundish, concave, reflex, unequal in size and situation. *Corolla:* petals five, roundish, concave, narrower at the base, spreading, very large. *Stamina:* filamenta numerous, (about three hundred,) capillary, short; antheræ oblong, quadrangular, erect, four-celled, large. *Pistil:* germina two, ovate, erect, tomentose; styles none; stigmas compressed, oblong, blunt, coloured. *Pericarp:* capsules as many, ovate-oblong, spreading and reflex, tomentose, one-celled, one-valved, opening longitudinally inwards. *Seeds:* several, oval, shining, coloured, fastened to the opening suture. *Observe.* The most natural number of the germen seems to be two, but it varies much in the species, and seldom amounts to five. Essential Character. *Calix:* five-leaved. *Petals:* five; styles none. *Capsule:* many-seeded.—The plants of this genus are all extremely hardy, and will grow in almost any soil and situation, on which account they are more valuable; for they will thrive under the shade of trees, and will retain their beauty longer there. They are propagated by parting their roots, which multiply very fast: the best season for transplanting them, is toward the end of August, or the beginning of September; for if they be removed after their shoots have shot out new fibres, they seldom flower strong in the succeeding summer. In parting these roots, always take care to preserve a bud upon the crown of each offset, otherwise they will come to nothing; nor should you divide the roots too small, especially if you have regard to their blowing the following year; for when their offsets are weak, they frequently do not flower in the succeeding summer, or at least produce but one flower upon each root: however, you may divide them as small as you please, wherever you would multiply them in quantities, provided there be a bud to each offset; but then they should be planted in a nursery-bed for a season or two, to acquire strength, before they are placed in the flower-garden. The single sorts may be generally propagated from seeds, which they generally produce in large quantities, wherever the flowers are allowed to remain. The seeds should be sown in the autumn, soon after they are ripe, upon a bed of light fresh earth, covering them over about half an inch thick with the same light earth. In the following spring the plants will come up, when they should be carefully cleared from weeds, and in very dry weather refreshed with water, which will greatly forward their growth; in this bed they should remain two years, before they are transplanted; observing in autumn, when the leaves are decayed, to spread some fresh rich earth over the beds, about an inch thick, and constantly to keep them clear from weeds. When you transplant them, which should be done in September, dig some beds of fresh light earth, removing all the roots of the weeds; then set the plants therein, six inches asunder, and about three inches deep. In these beds they may remain until they flower, after which they may be transplanted where you design they should grow. It is very probable there may be some varieties obtained from the seeds of these plants, as is common in most other flowers: so that those which produce beautiful flowers may be placed in the flower-garden; but such as continue single, or ill-coloured, may be planted in beds, to propagate for medicinal use. All the sorts with double flowers are preserved in gardens, for their beauty, and add greatly to the variety, when intermixed with other large-growing plants in the borders; they are also highly ornamental in flower-pots placed in rooms.——The species are,

1. Pæonia Albiflora; *White-flowered Pæony.* Leaves ternate; leaflets lobed, shining; germina in threes, smooth; root brown, composed of a few cylindrical or fusiform tubers, a span in length, united at top, the flesh white, with little taste; stem from a radical leafless sheath, two feet high, the thickness of a reed, slender, round, with scarcely conspicuous grooves, descending from each petiole down both sides, green tinged with red, naked at bottom. The whole plant is very smooth, and shining. It differs remarkably from the Common Pæony: in having the stem more slender, rounder, scarcely grooved, more rigid; 2. in having the leaves larger, biternate, with broader smoother leaflets,

veins scarcely prominent underneath; 3. in having the floral leaf more remote; 4. in the colour of the flower, and especially the pleasant smell, like that of Narcissus; 5. in the smoothness of the germina; and, 6. in having both root and herb more insipid; it also flowers later. This plant is well known among the Daurians and Mongols, on account of the root, which they boil in their broth, and the seeds, which they grind and put into their tea; they call the plant *Dschina;* the Russians call it *Margin koren bjelyi.*—Native of Siberia.

2. Pæonia Officinalis; *Common Pæony.* Leaves doubly-pinnate, sublobed; leaflets oblong, veined underneath. There are two principal varieties of this, the common Female, and Male Pæony: the roots of the Female Pæony are composed of several roundish thick knobs, or tubers, which hang below each other, fastened with strings; the stalks are green, about two feet and a half high; the leaves are composed of several unequal lobes, which are variously cut into many segments; they are of a paler green than those of the Male, and are hairy on their under side; the flowers are smaller, and of a deeper purple colour. The roots of the Male Pæony are composed of several oblong knobs, hanging by strings fastened to the main head; stems the same height with the preceding; they are terminated by large single flowers, composed of five or six large roundish red petals: the flowers of both sorts appear in May, and the seeds ripen in autumn. It is scarcely necessary to observe, that the old names of *male* and *female* have no reference to the sexes of the flowers, which in both are hermaphrodites. That called the Male Pæony, is chiefly cultivated for the roots, which are justly celebrated for their beneficial effects as a medicine, in disorders of the head and nerves. The best method of administering them is in powder, of which twelve grains is a sufficient dose: this, if persevered in for some time, will greatly alleviate nervous complaints, head-achs, and convulsions. It soon cures that disagreeable complaint, the night-mare, and is recommended for obstructions of the liver, and for complaints arising from such obstructions: an infusion of the root is also prescribed for obstructed menstruation, and for hysteric and nervous complaints, particularly the falling sickness. The Male Pæony varies with pale, and white flowers, and with larger lobes to the leaves. There are also several varieties of the Female Pæony, with double flowers, differing in size and colour.—The following varieties are worth noticing, 1. Foreign Pæony, with a deep red flower: the roots are composed of roundish knobs, like those of Female Pæony; the leaves also are the same, but of a thicker substance; the stalks do not rise so high; and the flowers, which appear later, have a greater number of petals: it is a native of the Levant. The large double Purple Pæony, is probably a variety of this. 2. Hairy Pæony, with a larger double red flower, has also roots like the common Female Pæony; but the stalks are taller, and of a purplish colour; the leaves are much longer, with spear-shaped entire lobes; the flowers are large, and of a deep colour. 3. Pæony of Portugal, it bears a single sweet flower: the roots are not composed of roundish tubers, but consist of two or three long, tapered, forked fangs, like fingers; the stalk rises little more than a foot high, and is terminated by a single flower, which is of a bright red colour, smaller than the preceding, and of an agreeable sweet scent: it is a native of Portugal, and requires a lighter soil, and warmer situation, than the others.

3. Pæonia Laciniata; *Jagged-leaved Pæony.* Leaves biternate; leaflets acutely laciniate; germina smooth; root tuberous, difform, very large, descending by cylindrical processes, a span in length, yellowish without, white within, both fresh and dry having a very strong smell and taste of bitter almonds or peach kernels; root-leaves none, but red awnless sheaths; flower nodding a little; the calix has three lanceolate leaflets, equal to the corolla in length, purple at the base, leafless and reflex at the end, and the three inner leaflets ovate-acuminate and concave; corolla handsome, spreading a little, deep rose-coloured, with a slightly virose smell, six-petalled, in gardens frequently seven-petalled; petals oblong, oval, waved, tender, the outer larger, the inner narrower.—Native of Siberia. In the gardens at Petersburg it flowers sooner than the other species, namely, about the end of May. The root dried is used by the Mongols and some Tartars, as sauce for their meat; and Boetcher, an army surgeon, found it to be useful in intermittent fevers. It grows principally in mountainous woods.

4. Pæonia Hybrida; *Mule Pæony.* Leaves ternate, multifid; segments linear; germina three, pubescent. This has nearly the stature of the last, and is much taller than the next; stem about a finger's thickness, obscurely channelled. This plant is supposed to have originated in the botanic garden at Petersburg from the seeds of the fifth species, sown in the same bed with that of the third: it is conjectured to be a mule between these two species, since it has never produced ripe seeds. It occurs of a much smaller size in some parts of Siberia.

5. Pæonia Tenuifolia; *Slender-leaved Pæony.* Leaflets linear, many-parted; germina two, tomentose; root creeping, putting forth tuberous fibres, with tubercles the size of a hazel-nut, white, fleshy, of a bitterish taste; stems scarcely a foot high, and commonly single, but in the garden eighteen inches high, and producing several from the same root; root-leaves none; the upper leaves simply multifid; flower sessile at the uppermost leaf, subglobular, accompanied by two leaflets, one multifid, the other simple, both dilated at the base, of a deep rich blood-colour, with yellow stamens.—Native of the Ukraine.

6. Pæonia Moutan; *Chinese Tree Pæony.* Stem woody, perennial; leaflets oblong-ovate, glaucous and somewhat hairy beneath, the terminal one three-lobed; germina numerous, distinct. The flowers are terminal, and solitary, six to eight inches broad, consisting of numerous jagged rose-coloured petals, with yellow anthers.—Native of China.

Painted Lady Pea. See *Lathyrus.*

Palavia; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth one-leafed, half five-cleft, permanent. *Corolla:* petals five, roundish, inserted into the base of the tube of the stamina. *Stamina:* filamenta very many, united below into a tube, in the top of the tube free; antheræ roundish. *Pistil:* germen globular; style many-cleft at top, short; stigmas capitate. *Pericarp:* capsule roundish, many-celled; cells not opening, placed in a ball on the elevated central receptacle. *Seeds:* solitary, roundish, angular. Essential Character. *Calix:* half five-cleft. *Style:* many-cleft. *Capsule:* many-celled; cells in a ball on the raised central receptacle.—The species are,

1. Palavia Malvifolia. With smooth cordate leaves, either obtusely and deeply crenated, or lobed. This is an annual plant, with red, declinate, very branchy stems, scarcely a palm long. The corolla is rose-coloured.—Native of sandy places near Lima in Peru, where Dombey found it flowering in July, August, and September.

2. Palavia Moschata. With tomentose, cordate, and ovate-crenated leaves. Stem upright, branchy, and two feet high; flowers large, and of a yellowish purple. The whole plant is downy, and has a musky smell.—Observed near Lima in Peru.

Pallasia; a genus of the class Syngenesia, order Polygamia Frustranea.—Generic Character. *Calix:* common imbricate, many-leaved, permanent; leaflets lanceolate, rather acute, flattish, spreading; the interior ones longer. *Corolla:* compound radiate; corollules hermaphrodite, in the elongated disk numerous; females about ten in the ray: proper in the hermaphrodites long, funnel-form; border five-cleft; divisions lanced, revolute; female strap-shaped, unequally bifid, trifid, or quadrifid; divisions wide, reflex. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindric, tubular, five-toothed. *Pistil:* germen inferior, compressed, wedge-shaped, ciliated at the tip and sides; style filiform, the length of the stamina; stigma bifid, thickish. In the females, germen as in the hermaphrodites; style none; stigma none. *Pericarp:* none. *Calix:* unchanged. *Seeds:* in the hermaphrodites, solitary, wedge-shaped, flat, compressed, two-horned, silky. In the females, none. *Receptacle:* convex, punctate, tuberculated, chaffy; chaffs concave, acute, shorter than the flower. Essential Character. *Receptacle:* chaffy. *Down:* none. *Seeds:* vertical, flat; margin ciliated. *Calix:* imbricate.—The species are,

1. Pallasia Halimifolia. This is a shrubby plant, of about two feet high; the leaves are alternate, footstalked, obtuse, or a little acute, downy on both sides, and whitish. The ray of the corolla is of a deep yellow; the corollules of the disk yellow, and the antheræ red.—Native of Lima.

2. Pallasia Grandiflora. Leaves bluntish, nearly entire, glaucous, smooth; radiant florets slightly three-notched, thrice the length of those of the disk.—Native of New Spain.

3. Pallasia Serratifolia. Leaves pointed, serrated, hoary beneath; with winged serrated footstalks; radiant florets three-toothed. Stem three feet high, branched, leafy, downy, ribbed.—Native of Mexico.

Palm-Tree. see *Phœnix.*

Panax; a genus of the class Polygamia, order Dicœcia; or, according to Swartz, of the class Pentandria, order Digynia.—Generic Character. *Hermaphrodite Flowers. Calix:* umbel simple, equal, clustered; involucre many-leaved, awl-shaped, very small, permanent; perianth proper very small, five-toothed, permanent. *Corolla:* universal, uniform; proper of five oblong, equal, recurved petals. *Stamina:* filamenta five, very short, deciduous; antheræ simple. *Pistil:* germen roundish, inferior; styles two, small, upright; stigmas simple. *Pericarp:* berry cordate, umbilicate, two-celled. *Seeds:* solitary, cordate, acute, plano-convex. *Male flowers, on a distinct plant. Calix:* umbel simple, globular, with very many equal coloured rays; involucre composed of lanceolate sessile leaflets, the same number with the external rays; perianth turbinate, quite entire, coloured. *Corolla:* petals five, oblong, blunt, narrow, reflex, placed on the perianth. *Stamina:* filamenta five, filiform, longer, inserted in the perianth; antheræ simple. Essential Character. *Umbel:* of many rays. *Corolla:* five-petalled. *Stamina:* five. *Hermaphrodite. Calix:* five-toothed, superior. *Styles:* two. *Berry:* two-seeded. *Male. Calix:* entire.——The species are,

1. Panax Quinquefolium; *Ginseng.* Leaves tern quinate; root fleshy, taper, as large as a man's finger, jointed, and frequently divided into two branches, sending off many short slender fibres. The stalk rises nearly a foot and half high, and is naked at the top, where it generally divides into three smaller footstalks, each sustaining a leaf composed of five spear-shaped leaflets, serrate, pale green, and a little hairy. The flowers grow on a slender peduncle just at the division of the petioles, and are formed into a small umbel at top; they are of an herbaceous yellow colour, and appear at the beginning of June. The berries are first green, but afterwards turn red, and inclose two hard seeds, which ripen in the beginning of August.—This plant is a native of Chinese Tartary, and also of North America. It is very abundant in Canada in plain parts of the woods; is fond of shade, of a deep rich mould, and of land which is neither wet nor high. It flowers in May and June, and the berries are ripe at the end of August. It is not common every where, for in some parts it is not to be found for several miles, but in those spots where it grows it is always in great abundance. When the French possessed Canada, they gathered great quantities and sent it to France, whence it was exported to China, and sold there to great advantage at the first outset; but its price afterwards fell considerably, probably by overstocking the Chinese, or because that shrewd race of notorious knaves could not fail to discover that the American Ginseng was inferior to their own. The Canadian Indians collect the roots in the woods, and sell them to the merchants, who spread them on the floor to dry for two months, or more, according to the season, turning them once or twice every day. Osbeck informs us, that the Chinese hang the American roots over a boiling pot, that they may sweat, and dry them afterwards. They are said to dip their own roots in a decoction of the leaves of the plant. Others say, that the Chinese, after having washed the roots, soak them in a decoction of rice or millet seed, and then expose them to the steam of the liquor, by which they acquire their firmness and clearness. The Chinese and Tartars agree in ascribing extraordinary virtues to this root, and have long considered it as a sovereign remedy in almost all diseases to which they are liable, having no confidence in any medicine except in combination with Ginseng. Osbeck says, that he never looked into the apothecaries' shops, but they were always selling Ginseng; that both poor people, and those of the highest rank, use it; and that they boil half an ounce in their tea or soup every morning, as a remedy for a consumption, and other diseases. Jartoux relates, that the most eminent physicians in China have written volumes on the medicinal powers of this plant, asserting that it gives immediate relief in extreme fatigue either of body or mind, that it dissolves pituitous humours, and readers respiration easy, strengthens the stomach, promotes appetite, stops vomitings, removes hysterical, hypochondriacal, and all nervous affections, giving a vigorous tone of body even in extreme old age. Jartoux himself was so biassed by Eastern prejudice in favour of Ginseng, that he seems to give their extravagant accounts of its effects full credit, and confirms them in some measure from his own experience. The French in Canada use this root for curing the asthma, as a stomachic, and to promote fertility in women. European physicians assert, that we have no proofs of the efficacy of Ginseng, and that from its sensible qualities it seems to possess very little power as a medicine. Dr. Cullen says, "We are told that the Chinese consider Ginseng as a powerful aphrodisiac; but I have long neglected the authority of popular opinions, and this is one instance that has confirmed my judgment. I have known a gentleman a little advanced in life, who chewed a quantity of this root every day for several years, but who acknowledged that he never found that it in any way improved his faculties." These observations of the above celebrated physicians are however no proof that, after all due allowances are made for popular prejudices, Ginseng may not be a good medicine for many disorders in the country where it naturally grows. It is commonly used in decoction, a drachm of the root being long boiled in a sufficient quantity of water for one dose. Lewis tells us, that a drachm of the Ginseng

root may be sliced and boiled in a quarter of a pint of water to about two ounces; then a little sugar being added, it may be drank as soon as it becomes sufficiently cool. The dose must be repeated morning and evening; but the second dose may be prepared from the same portion of root as was used at first, for it will always admit of being twice boiled. The dried root of Ginseng imported into England, is scarcely the thickness of the little finger, about three or four inches long, frequently forked, transversely wrinkled, of a horny texture, both within and without of a yellowish white colour. To the taste it discovers a mucilaginous sweetness, approaching to that of liquorice, accompanied with some degree of bitterness, and a slight aromatic warmth, with little or no smell. It is far sweeter, and of a more grateful smell, than the leaves of Fennel, to which some have compared it; and it also differs remarkably from those roots, in the nature and pharmaceutic properties of its active principles; the sweet matter of the Ginseng being preserved entire in the watery as well as the spirituous extract, whereas that of Fennel roots is destroyed or dissipated in the inspissation of the watery tincture. The slight aromatic impregnation of the Ginseng is likewise in good measure retained in the watery extract, and perfectly in the spirituous. Father Loureiro doubts whether the American Ginseng be the same with the precious *Ginsem* of the Chinese, the latter being the dearest in China itself; so that if our physicians have only used the sort that is imported from Canada, they have not yet made a fair trial of the Ginseng to which the eastern nations attribute so many virtues.—The American species has been introduced into the English gardens, where it has been planted in a shady situation and a light soil, and the plants have thriven and produced flowers, and ripened their seeds annually, but not one of these seeds have grown. They have been sown several years soon after they were ripe, without any success: the seed obtained from America has also been sown in various situations, but still without producing a single plant; and by the accounts sent from China, it appears that the same results have followed the planting of them there: all which tends to prove that there is a necessity for the hermaphrodite plants to have some male plants near them, to render the seeds prolific; for all those plants from which seeds have been saved, had hermaphrodite flowers; and though the seeds seemed to ripen perfectly, yet they did not grow after lying undisturbed in the ground for three years. Kalm says, that the American Ginseng bears transplanting very well, and will soon thrive in its new ground; and adds, that he was informed that the seeds lie one or two years in the ground before they appear.

2. Panax Attenuata; *Taper-pointed Tree Panax.* Leaves ternate, or quinate; leaflets ovate, attenuated, crenate; trunk arborescent. This is a tree 40 feet high, with round, smooth, unarmed branches; common petioles round, smooth, longer than the leaves, a foot long, sheathing at the base; sheaths half-embracing, within the base of the petiole, above free and acuminate; flowers hermaphrodite, all fertile; seeds solitary.—Native of the West Indies, in Guadaloupe and St. Christopher's.

3. Panax Trifolia; *Three-leaved Panax.* Leaves ternate; stem single, not more than five inches high, dividing into three footstalks, each sustaining a trifoliate leaf, with the leaflets longer, narrower, and more deeply indented on their edges, than in the first species.—Native of North America.

4. Panax Aculeata; *Prickly Panax.* Leaves ternate, the uppermost next the flowers crowded and simple; petioles and branchlets prickly; stem shrubby. This is a shrub, with a recurved prickle at the base, and at the tip of the petioles.—Native of China.

5. Panax Spinosa; *Thorny Panax.* Leaves quinate, alternate; spines solitary, below the branches; umbels lateral. The shoots consist of three or four leaves without a branchlet, and among these leaves is a filiform peduncle, with a simple umbel, and small white flowers.—Native of Japan.

6. Panax Arborea; *Tree Panax.* Leaves septenate, (according to Forster, quinate-obovate, serrate, toothed;) umbels compound, large, with elongated rays; leaflets seven, of different sizes, oblong, serrate, very smooth, shining.—Native of New Zealand.

7. Panax Chrysophylla; *Golden-leaved Panax.* Leaves in sevens and nines; leaflets lanceolate, quite entire, tomentose underneath; umbels panicled. This is a lofty tree, with branches the thickness of a thumb at top; which, together with the leaves underneath, the younger petioles, the branches of the panicle, the calices, and petals, on the outside, are all covered with a fine golden cottony down; flowers small.—Found in Guiana, and the island of Trinidad.

8. Panax Fruticosa; *Shrubby Panax.* Leaves superdecompound; tooth ciliate; stem shrubby. This is an upright shrub, six feet high, with a thick, juicy, unarmed stem, and oblique branches; flowers red and green, terminating in a diffused panicle, ending in umbels, on a long, purple, striated peduncle. This plant is cultivated in China and Cochinchina, where the root and leaves are used in medicine. The plant has a strong aromatic parsley-like flavour, and penetrating taste. It is reputed to be diuretic, and to be beneficial in the dropsy, dysury, and gonorrhœa.—Native of the island of Ternate.

9. Panax Simplex; *Simple-leaved Panax.* Leaves alternate, lanceolate, serrate; umbels compound.—Native of New Zealand.

10. Panax Horridum; *Palmate Prickly-leaved Panax.* Leaves simple, alternate, serrated, with prickly ribs; stem shrubby, very prickly.—Found at Nootka Sound.

Pancratium; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* spathe oblong, obtuse, compressed, opening on the flat side, shrivelling. *Corolla:* petals six, lanceolate, flat, inserted into the tube of the nectary on the outside above the base; nectary one-leafed, cylindric, funnel-form, coloured at top, with the mouth spreading and twelve-cleft. *Stamina:* filamenta six, awl-shaped, inserted into the tips of the nectary, and longer than them; antheræ oblong, incumbent. *Pistil:* germen bluntly three-cornered, inferior; style filiform, longer than the stamina; stigma blunt. *Pericarp:* capsule roundish, three-sided, three-celled, three-valved. *Seeds:* several, globular. ESSENTIAL CHARACTER. *Petals:* six. *Nectary:* twelve-cleft. *Stamina:* placed on the nectary.——The species are,

1. Pancratium Zeylanicum; *Ceylonese Pancratium.* Spathe one-flowered; petals reflex; root rather large, bulbous; leaves long and narrow, of a grayish colour, and pretty thick, standing upright. The flower has a very agreeable scent, but is only of short duration; it is white, with yellow anthers. Native of Ceylon.—This, together with the other East and West Indian sorts, are too tender to thrive in England, except in a good stove. If the pots be plunged into the bark-bed, they will thrive and flower well. In the dry-stove their flowers will not be so strong, nor will they appear oftener than once a year; whereas in the tan-bed they will often flower two or three times. They are propagated by offsets from the roots, or by the bulbs which succeed the flowers. If the latter be planted in small pots filled with light earth from a kitchen-garden, and plunged into a moderate hot-bed, they will soon put out roots and leaves, and

with care will become blowing roots in one year: if these are kept constantly in the tan-bed, they will put out offsets from the roots, and thrive as well as in their native countries.

2. Pancratium Mexicana; *Mexican Pancratium.* Spathe two-flowered; stem or scape a long span in height, round, forked towards the top, or dividing into two peduncles, with two oblong, tender, membranaceous, greenish leaflets, and terminated each with a white flower, divided to the very base into six narrow segments.—Native of Mexico.

3. Pancratium Caribæum; *Caribbean Pancratium.* Spathe many-flowered; leaves lanceolate; segments of the corolla linear, and longer than the tube. The stalk rises about a foot high, then divides like a fork into small footstalks or rather tubes, which are narrow, green, and at first encompassed by a thin spathe, which withers, and opens to give way to the flowers, which are white and scentless. Dr. Browne says, it grows wild in most parts of Jamaica, and the other sugar islands, with large leaves and numerous flowers, seldom rising above sixteen or eighteen inches in height. Dr. Houstoun imported some of the roots from Vera Cruz.—Native of the West Indies.

4. Pancratium Maritimum; *Sea Pancratium.* Spathe many-flowered; petals flat; leaves tongue-shaped; root large, bulbous, coated, of an oblong form, covered with a dark skin; the leaves are shaped like a tongue; they are more than a foot long, and one inch broad, of a deep green, six or seven of them rising together from the same root, encompassed at bottom with a sheath: between these arises the stalk, which is a foot and half long, naked, sustaining at the top six or eight white flowers, inclosed in a sheath, which withers, and opens on the side to make way for the flowers to come out.—Native of the south of Europe, on the sea-coasts of Spain and Sicily. It must be planted in a very warm border, and screened from severe frost, otherwise it will not live through the winter in England.

5. Pancratium Declinatum. Spathe many-flowered: scape compressed, ancipital; segments of the corollas a little longer than the tube; leaves tongue-shaped; flowers sweet, white, sessile, almost half a foot in diameter.—It is cultivated in the gardens of Martinico; probably a native of Cayenne.

6. Pancratium Carolinianum; *Carolina Pancratium.* Spathe many-flowered; leaves linear; stamina the length of the nectary. This has a roundish bulbous root, covered with a light brown skin, from which arise several dark green leaves about a foot long; among these comes out a thick stalk about nine inches high, sustaining six or seven white flowers, with very narrow petals, having large bell-shaped nectaria or cups deeply indented on their brims.—Native of Jamaica and Carolina.

7. Pancratium Illyricum; *Starry Pancratium.* Spathe many-flowered; leaves ensiform; stamina longer than the nectary. This has a large bulb, covered with a dark skin, sending out many thick strong fibres, striking deep in the ground; flowers white, six or seven in number.—Native of the south of Europe. It grows wild on the sandy coast of the isle of Ree near Rochelle, according to Morison. This sort is hardy, and will thrive through the winter in the full ground: in very severe seasons the surface should be covered with tanner's bark, sea-coal ashes, straw, or pease-haulm. It is propagated either by offsets from the roots, or from seeds. The offsets will flower very strong the second year, whereas those which are raised from seeds seldom flower in less than five years. The roots should not be removed oftener than every third year if they are expected to flower strong. The best time to transplant them is in the beginning of October, soon after their leaves decay. They should not be kept long out of the ground, for, as they do not lose their fibres every year, if they be dried it greatly weakens the roots. It loves a light sandy soil, and a sheltered situation; the roots should be planted nine inches or a foot asunder every way, and five inches deep in the ground. If the plants be propagated by seeds, they should be sown in pots filled with light earth, soon after they are ripe: these pots should be placed under a hot-bed frame in winter, but the glasses must be taken off every day in mild weather. The young roots will require a little protection in the winter, till they have obtained strength. See *Narcissus*, for further particulars of their management.

8. Pancratium Littorale; *Tall Pancratium.* Spathe many-flowered; leaves lanceolate, linear, bifarious; segments of the corolla linear, shorter than the tube; nectary almost entire; scape two feet high, very much compressed, an inch wide on one side, ancipital, shining, green with a glaucous bloom, axillary, erect, or sometimes declining; flowers handsome, spreading, sessile at the top of the scape, having an agreeable aromatic odour; bulb the same size as the first species.—It is found in abundance on the sandy coast of the island Tierra Bomba near Carthagena.

9. Pancratium Verecundum; *Narcissus-leaved Pancratium.* Spathe many-flowered; leaves linear; segments of the corolla lanceolate, shorter than the tube; the sinuses of the segments of the nectary staminiferous; scape erect, compressed; a foot high; flowers fragrant, on three-cornered pedicels, scarcely half an inch long. They appear from June to August.—Native of the East Indies.

10. Pancratium Amboinense; *Broad-leaved Pancratium.* Spathe many-flowered; leaves ovate, nerved, petioled; bulb oblong, white, sending out several thick fleshy fibres, which strike downward; stalk thick, round, succulent, rising nearly two feet high, sustaining at the top several white flowers, shaped like those of the other sorts, but the petals are broader, the tube is shorter, and the stamina are not so long as the petals. The remarkably broad heart-shaped leaves, of a pale green, with many strong ribs, abundantly distinguish this species.—Native of Amboyna.

11. Pancratium Americanum; *White Lily.* Leaves nearly a foot and half long, and little more than an inch broad, dark green, and hollowed in the middle, like the keel of a boat; stalks nearly two feet high, thick, succulent, sustaining at the top eight or ten white flowers, shaped like those of Maritimum, but of a purer white, and having a strong sweet odour, like that of Balsam of Peru: the flowers seldom continue longer than three or four days, and in very hot weather not so long.—Native of the West India Islands.

12. Pancratium Latifolium. This is not often distinguished from the preceding, though it differs from it in the leaves being much larger and broader, for they are nearly two feet long, and more than three inches broad, and hollowed like the keel of a boat, as in the other; the flowers also are larger, the petals longer, and the scent weaker. It flowers throughout the year.—Native of the West Indies.

13. Pancratium Rotatum; *Large-crowned Pancratium.* Spathes multiflorous; leaves linear-lanceolate; nectaries hypocrateriform, tubulose beneath; teeth six, staminiferous; intermediate ones inciso-dentate; stamina as long again as the nectary.—Found on the sea-coast, from Virginia to Florida; and flowers in July.

Pandanus; a genus of the class Diœcia, order Monandria. —Generic Character. *Male. Calix:* spathes alternate, sessile, serrate, spiny; spadix decompound, naked; perianth proper, none. *Corolla:* none. *Stamina:* filamenta very many, solitary, placed scatteringly on the outer ramifications of the

P. 232.

PANCRATIUM MARITIMUM ___ *Sea Pancratium.*

P. 229.

E. Hilliard sc.

PÆONIA ___ *The Levant Peony.*

H. Fisher, Son & Cº London, 1828.

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spadix, very short; antheræ oblong, acute, erect. *Female*, on a separate plant. *Calix* and *Corolla:* none. *Pistil:* germina numerous, aggregate, sessile, five-cornered, convex at top, smooth; style none; stigmas two, cordate, margined. *Pericarp:* fruit subglobular, large, consisting of numerous, wedge-shaped drupes, convex at top, angular, farinaceous, one-seeded. *Seed:* solitary, oval, even in the centre of the drupe. ESSENTIAL CHARACTER. *Calix* and *Corolla:* none. *Male. Antheræ:* sessile, inserted into the ramifications of the spadix. *Female. Stigmas:* two. *Fruit:* compound.——The only known species is,

1. Pandanus Odoratissimus; *Sweet-scented Pandanus*, or *Screw Pine*. Trunk generally in the form of a very large spreading bush, though it may sometimes be found with a single and pretty erect trunk of ten feet in height, and a round branching head. From the stems, or larger branches, issue large carrot-shaped blunt roots, descending till they come to the ground, and then dividing: the substance of the most solid is something like that of a cabbage stalk, and by age acquires a woody hardness on the outside. Leaves confluent, stem-clasping, closely imbricated in three spiral rows round the extremities of the branches, bowing, from three to five feet long, tapering to a very fine long triangular point, very smooth and glossy; margins and back armed with very fine sharp spines; those on the margins point forward, those of the back point sometimes one way and sometimes the other. The male flowers are in a large, pendulous, compound, leafy raceme, the leaves of which are white, linear, oblong, pointed, and concave; in the axil of each there is a single thyrse of simple small racemes, of long-pointed depending antheræ. Female flowers on different plants, terminating and solitary, having no other calix or corolla than the termination of the three rows of leaves, forming three imbricated fascicles of white floral leaves, like those of the male raceme, which stand at equal distances round the base of the young fruit: fruit compound, oval, from five to eight inches in diameter, and from six to ten in length, weighing from four to eight pounds, rough, of a rich orange colour, composed of numerous wedge-shaped angular drupes; when ripe, their large or exterior ends are detached from one another, and covered with a firm deeper orange-coloured skin; apices flat, consisting of as many angular, somewhat convex tubercles, as there are cells in the drupe, each crowned with the withered stigma internally; the exterior half of these drupes, next the apex, consist of dry spongy cavities, their lower part next the core, or common receptacle, is yellow, consisting of a rich looking yellow pulp, intermixed with strong fibres; here the nut is lodged. The nut is compound, top-shaped, exceedingly hard, angular, containing as many cells as there are divisions on the apex of the drupe; each cell is perforated above and below.—Native of the warmer parts of Asia: all soils and situations seem to suit it equally well, and it flowers chiefly during the rainy season. It is cultivated for hedges, and answers well, except that it takes too much room; as it grows readily from branches, it is rare to find the full grown ripe fruit. The lower pulpy part of the drupe is sometimes eaten by the natives, in times of scarcity and famine; the tender white base of the leaves is also eaten raw or boiled, at such melancholy times; the taste of the pulpy part of the drupe is very disagreeable. The tender white leaves of the flowers, principally those of the male, yield that most delightful fragrance for which they are so generally esteemed; and of all the perfumes, it is by far the richest and most powerful. The roots are composed of tough fibres, which basket-makers use to tie their work with; they are so soft and spongy, as to serve the natives for corks; the leaves also are composed of longitudinal, tough, useful fibres. In the South Sea Islands, either this, or some other species or variety, is used for making mats. In the Sandwich Islands these mats are handsomely worked in a variety of patterns, and stained of different colours. The branches being of a soft, spongy, juicy nature, cattle will eat them when cut into small pieces. Forster says, that in Otaheite the fruit is called *E-Vara*, or *Wharra*, and the male flowers *Hinanno;* that it is fond of sandy coasts, and is found on almost all the islands of the Southern Ocean, within the tropics, even on those which are occasionally inundated; that it resembles the *Ananas* in the fruit and leaves; that it is cultivated in Arabia and Ceylon, on account of the fragrancy of the male flowers; that the women in India powder their hair with the dust of the antheræ, which is very fragrant, and that they lay up the floral leaves and bunches of flowers among their clothes; that in Ternate they dress the flowers before they open, as sauce for flesh and fish; that in India the fruit is eaten by elephants, in Otaheite and the neighbouring islands by children, and when bread-fruit is scarce even by grown persons; and that it has a fine aromatic scent like the Strawberry or the Pine Apple, a taste at first sweetish, but afterwards astringent and austere. *Mugalie*, is the Telinga name of the male plant; and *Ghæzangee*, that of the female.—This plant may be increased by sowing the seeds in pots of light earth, and plunging them into the bark-bed of the stove; where they must constantly remain, and be managed as other tender exotics. Their large spreading foliage has a fine effect among other stove plants.

Panicum; a genus of the class Triandria, order Digynia. —GENERIC CHARACTER. *Calix:* glume two-flowered, two-valved; valves subovate, nerved; the outer valve a little lower, very small; one floret hermaphrodite, the other neuter, or male. *Corolla:* hermaphrodite; glume two-valved; the outer valve (in the bosom of the smaller calicine valve,) flattish, nerved; the inner membranaceous, flat, with the edges bent in, often small, or very small; nectary two-leaved, very small, gibbous: in the neuter florets none. *Stamina:* filamenta three, capillary; (the neuter florets have no stamina;) antheræ oblong. *Pistil:* in the hermaphrodites; germen roundish; styles two, capillary; stigmas feathered: in the neuters none. *Pericarp:* none; corolla adheres to the seed without opening. *Seed:* one, covered, roundish, flattish on one side. *Observe.* Neglecting the inner valve of the neuter floret, the outer seems to belong to the calix; hence, three calicine valves are commonly reckoned by botanists, among which the third is very small. ESSENTIAL CHARACTER. *Calix:* two-valved, the third valve very small.—Most of these plants are natives of warm climates, where some are used by the inhabitants to make bread. These grow very large, and require a good summer, otherwise they will not ripen in this country. The seeds should be sown at the latter end of March or the beginning of April, on a moderate hot-bed; and the plants should be planted out, when grown to a proper size, upon a bed of light rich earth, in a warm situation. They should be planted in rows, about three feet asunder, and the plants must be kept clean from weeds. When the plants are grown pretty tall, they should be supported by stakes, otherwise the winds will break them down; and when the corn begins to ripen, the birds must be kept from it, otherwise they will soon destroy it.——The species are,

* *Flowers spiked.*

1. Panicum Polystachyon; *Many-spiked Panic Grass.* Spikes round; involucrets one-flowered, in bundles, and bristly; culms erect, branched at top; leaves hairy at top, almost opposite: biennial.—Native of the East Indies, &c.

2. Panicum Sericeum; *Silky Panic Grass.* Spike round; involucres bristle-shaped, villose, one-flowered, the length of the flowers; leaves flat.—This is an annual grass, native of the West Indies. It flowers from June to September.

3. Panicum Verticillatum; *Rough Panic Grass.* Spike whorled; racemelets in fours; involucrets one-flowered, two-bristled; culms diffused.—Native of Europe, the Levant, and Japan. In England, Mr. Ray describes it as having been found between Putney and Rochampton, and beyond the neat houses by the Thames' side. Mr. Curtis found it sparingly in the gardeners' ground in Battersea fields, with the sixth species, and flowering at the same time. Scheuchzer remarks, that it is a troublesome weed in the gardens near Paris. There are two varieties, one larger and one smaller.

4. Panicum Helvorum; *Pale-red Panic Grass.* Spike round; involucrets one-flowered, in bundles, and bristly; seeds nerved. This is an annual grass, bearing a great resemblance to the next species, but in reality different; culm six feet high, branched; barren branches shorter; peduncles scarcely streaked at the tip.—Native of the East Indies.

5. Panicum Glaucum; *Glaucous, Panic Grass.* Spike round; involucrets two-flowered, in bundles, and hairy; seeds waved and wrinkled. Root fibrous, annual; culms a foot high, erect, leafy, having four knots, grooved at the top, even. It flowers in June and July.—Native of the East Indies, America; and several parts of Europe, as Italy, the south of France, Germany, and Switzerland.

6. Panicum Viride; *Green Panic Grass.* Spike round; involucrets two-flowered, in bundles, and hairy; seeds nerved. Mr. Curtis remarks, that this species, to correspond with its trivial name, should be always green, but that its foliage is often red; and its spikes reddish-brown; and that the third species is the contrary, but the spike will always distinguish them. Root annual; culms from a foot to eighteen inches in height, oblique, leafy, having three knots, streaked at top, rugged. Sparrows are very fond of the seeds of this plant, and indeed of the seeds of all the genus; so that when cultivated in a garden, they require to be protected from them. It flowers in July and August, and is an annual grass, of no use in cultivation.—Native of Germany, Carniola, and England. With us it is not common, though the most so of all the genus. It has been found in Battersea fields, near London; by Martha's chapel near Guildford, in Surry; and in the gravel pits by Chippenham park, Cambridgeshire, and in the corn-fields adjoining.

7. Panicum Germanicum; *German Panic Grass.* Spike compound, close; spikelets glomerate; involucrets bristle-shaped, longer than the flower; rachis hirsute. This has been confounded with the next species; from which it is distinct, in having the spike not interrupted at the base, smaller, and ovate, in the height of the culm, in the shortness of the involucrets, and in having the rachis hirsute. It is annual, and perishes soon after the seeds are ripe. There are three varieties of it, with yellow, white, and purple grains. It has been formerly cultivated for bread in some of the northern countries, but is not so much esteemed as the next species; but nevertheless as it will ripen better in a cold climate, it is generally cultivated where a better sort of grain will not succeed: yet neither of them are reckoned to afford so good nourishment as Millet.—Native of the southern parts of Europe. The seeds of this and the following species may be sown in the spring, at the same time as Barley is sown, and may be managed exactly in the same way; but they should not be sown too thick, for the seeds are very small, and the plants grow stronger, and therefore require more room. This species does not grow above three feet high, unless it be sown on very rich land, in which it will rise to four feet; but the leaves and stems are very large, and require to stand four or five inches apart, otherwise they will grow up weak, and come to little. These large-growing corns should be sown in drills, at about eighteen inches apart, so that the ground may be hoed between the rows, to keep them clear from weeds; and the stirring of the ground will greatly improve the corn, which will ripen in August, when it may be cut down and dried, and should be housed.

8. Panicum Italicum; *Italian Panic Grass.* Spike compound, with the base interrupted, nodding; spikelets glomerate; involucrets bristle-shaped, much longer than the flower; rachis tomentose. Culm annual, a foot and half high, round, thickish, upright, quite simple. It derives its trivial name from being frequently cultivated in Italy and other warm countries. It flowers in July and August.—Native of the East and West Indies, and Cochin-china. This grows to a much larger size than the preceding species, and produces much larger spikes; so that it should be allowed more room to grow, otherwise it will come to little. Cultivated like the preceding species.

9. Panicum Setosum; *Bristly Panic Grass.* Spike compound; spikelets panicle-fascicled; bristles mixed with the florets, and very long; peduncles almost smooth; height from two to four feet. Culm simple, erect, round, smooth, leafy; leaves half a foot long, lanceolate, flat, entire, pubescent; sheaths embracing the culm, villose at the neck; pedicels very short, smooth; rachis flexuose, bristly.

10. Panicum Lanceolatum; *Spear-leaved Panic Grass.* Spikes alternate; outer valve of the calices ciliate and awned; leaves lanceolate. Culms simple, decumbent, leafy, rooting, long.—Native of the East Indies.

11. Panicum Stagni; *Pond Panic Grass.* Spikes alternate, directed one way; calices two-flowered, awned, hispid. Culms erect, three feet high, leafy; leaves linear, flat, even, rough at the edge, with the mouths of the sheaths hairy; germen roundish-ovate, compressed.—Native of ponds in the East Indies.

12. Panicum Crus Corvi; *Crow-foot Panic Grass.* Spikes alternate, directed one way; spikelets subdivided; glumes sometimes awned, hispid; rachis three-cornered. Culm annual, two feet high, suberect, manifold, jointed, leafy. Though Loureiro describes it under the name of *Crus Corvi*, he observes, that it is intermediate between that and *Crus Galli*, and different from both. It flowers in July and August.—Native of the East Indies, Cochin-china, and Japan.

13. Panicum Crus Galli; *Thick-spiked Cock's-foot Panic Grass.* Spikes alternate and conjugate; spikelets subdivided; glumes awned, hispid; rachis five-cornered. Root annual; culms several, from one to two feet in height, thick, at first procumbent or oblique, but finally almost upright; flowering branches leafy, naked at top, even; joints thickened, cylindrical, dusky. The third petal of the corolla membranaceous, flat, acuminate, between the flat valve of the calix and the inner valve of the corolla. The seeds being large, and produced in plenty, are much esteemed by the small birds.—Native of Virginia, the Cape of Good Hope, and several parts of Europe, as Sweden, Germany, Switzerland, the south of France, and England. It was found in a garden between Deptford and Greenwich; with a smooth spike, in a lane near the neat house gardens; with an awned spike, by the rivulet side near Petersfield, Hampshire; also near Martha's Chapel in the neighbourhood of Guildford, Surry; in a coppice near Purfleet; and in Battersea fields.

14. Panicum Setigerum; *Bristle-bearing Panic Grass.* Spikes remote; florets directed one way; teeth of the rachis

bristle-bearing. Culms filiform, branched, leafy; leaves two inches long, subcordate at the base, with the edges of the sheaths ciliate.—Native of China.

15. Panicum Colonum; *Purple Panic Grass.* Spikes alternate, directed one way, awnless, ovate, rugged; rachis roundish. Root annual; culms a span high, round, ascending; leaves even, often ferruginous-spotted, purple at the throat, without a ligule. It flowers in July and August.—Native of the East Indies.

16. Panicum Fluitans; *Floating Panic Grass.* Spikes alternate, sessile, directed one way, the third calicine valve minute. Culm compressed, leafy; leaves linear. It is a very beautiful, smooth, even grass; flowers directed one way, alternate, sessile, imbricate.—Native of the East Indies, Arabia, and Madagascar.

17. Panicum Brizoides; *Briza-like Panic Grass.* Spikes alternate, sessile, directed one way; two of the calicine valve much shorter than the corolla, and retuse, the third the same length with the corolla. Culms decumbent at the base, compressed, with purple joints; leaves at the joints of the culm, first single, but afterwards several within the same sheath, linear, even; corolla cartilaginous, with the valves flat and very smooth, one margin embracing; stigmas pale rose colour.—Native of the East Indies.

18. Panicum Flavidum; *Yellowish Panic Grass.* Culm leafy; spikelets remote, sessile, pressed close, directed one way, few-flowered. This is an upright grass, from two inches to half a foot in height; root fibrous, the fibres undivided; flowers globular, alternate, directed one way, yellow, with green nerves. All the glumes of the calix violet-coloured at the tip.—Native of Ceylon.

19. Panicum Dimidiatum; *Half-spiked Panic Grass.* Spike halved, and directed one way; spikelets five-flowered, alternately pressed to the hollowed rachis. Culm ten feet high, very finely striated, ascending.—Native of the East Indies.

20. Panicum Burmanni; *Wave-leaved Panic Grass* Spikes mostly four, remote, directed one way, simple, the two outer glumes of the flowers awned. Culm decumbent, branched, villose, and rooting at the base; leaves lanceolate, with hairs thinly scattered over them; the sheaths villose at the edge; florets alternate, commonly abortive; corolla snow white, very smooth.—Native of the East Indies, and of Italy.

21. Panicum Hirtellum; *Rough-haired Panic Grass*, or *Scotch Grass.* Spike compound; spikelets pressed close, alternate; calices doubled, all the valves awned, outer longest. Culm creeping, ascending, three inches to a foot.—Native of the West Indies, and the south of Europe. This grass is cultivated, and thrives very luxuriantly, in all the low and marshy lands of Jamaica, where it is almost universally used as fodder for their stabled cattle: it is planted near the towns with great care, and found to be one of the most beneficial productions of the island, where its general growth is from two to four feet. It is propagated by the joints or root, and set in small drilled holes about two feet and a half asunder: the young shoots begin to appear in a few days, and as they grow they spread and creep along the ground, casting a few roots, and throwing out fresh roots from every joint, as they run; these soon supply the land, and fill the field with standing plants, which alone are generally cut. It is fit to cut in six months from the first planting, and every month or six weeks after, if the season fall in kindly, and due care be taken to keep the ground free from weeds. An acre of good ground well stocked with this grass, near Kingston or Spanish Town, is computed to bring in above 120*l.* a year; and when once planted, holds many years; but when the main stalk or root grows hard or woody, the younger shoots do not push so luxuriantly, and they are then obliged to plant anew; this however is easy, being done gradually, for the pieces are generally supplied as they clean them, by throwing up every stubbed or falling root they find, planting a few joints in the place.

22. Panicum Pilosum; *Hairy Panic Grass.* Spikes panicled, alternate, directed one way; spikelets in pairs, one smaller, acuminate, even; rachis compressed, hairy. Culm divaricate, jointed; leaves lanceolate, acute, even, rugged at the edge; sheaths approximating, compressed, villose at the base; peduncles from the sheathing internodes, compressed, short; antheræ purplish; filamenta none.—Native of Jamaica and other West India Islands, in woody mountainous pastures.

23. Panicum Molle; *Soft Panic Grass.* Spikes panicled, alternate, directed one way, spreading; spikelets approximating, pedicelled, directed one way, awnless. Culm from two to three feet high, decumbent at the base, ascending, subdivided at bottom, jointed, round, thick, pubescent. This is immediately known from the other species by its softness; and as the culm is thick and succulent, it is very grateful to cattle.—Swartz says it is a native of Surinam, and is commonly called *Dutch Grass* in Jamaica, where it grows in moistish fertile pastures.

24. Panicum Fasciculatum; *Fascicled Panic Grass.* Spikes fascicled, alternate, erect, subfastigiate; spikelets directed one way, roundish; height two or three feet. Culm jointed, erect, round, leafy, smooth.—Native of low grassy places in Jamaica.

25. Panicum Carthaginense; *Carthagena Panic Grass.* Spikes panicled; leaves shorter; spikelets directed one way; leaves roundish. Roots long, filiform, stiff, perennial; culm a foot high, very much branched, jointed, prostrate, compressed a little, grooved, stiff, smooth.—Native of grassy places near Carthagena in South America.

26. Panicum Conglomeratum; *Conglomerate Panic Grass.* Spike directed one way, subovate; florets blunt. Culms filiform, prostrate, very much branched, rooting; leaves lanceolate, even, with the sheaths shorter than half the internodes.—Native of the East Indies, near towns, and even in the streets.

27. Panicum Interruptum; *Broken-spiked Panic Grass.* Spike simple, interrupted; spikelets two-flowered, pedicelled, naked. This grass is three feet high, and smooth; knots of the culm black.—Native of stagnant waters in the East Indies.

28. Panicum Sanguinale; *Slender-spiked Cock's-foot Panic Grass.* Spikes digitate, knobbed at the inner base; florets in pairs, awnless; sheaths of the leaves dotted. Root annual; culms leafy, even, with three joints, at the two lower procumbent, the upper oblique, very long; flowering branches from the joints; leaves broadish, short, sublanceolate, even. All the stems which lie near the ground take root, and by this means, though an annual and short-lived plant, it increases and spreads very wide. The trivial name *Sanguinale*, is not derived from its colour, but from an idle trick which the boys in Germany have of pricking one another's nostrils with the spikelets of this grass until they draw blood.—This species is very universal, being found not only in Europe, but in Asia and America; and the Society Isles in the Southern Ocean. It is not common in England, but grows at Elden in Suffolk; Witchingham in Norfolk; near Martha's Chapel; by Guildford in Surry; Wandsworth field; and in the gardeners' grounds near Battersea: flowering from July to September.

29. Panicum Dactylon; *Fingered Panic Grass.* Spikes digitate, spreading, villose at the base on the insides; flowers solitary; runners creeping. Culm creeping at the base, and above that upright, nine inches or a foot in height, glaucous, smooth, frequently branched from the lower joints; joints purple, smooth, sometimes eight or nine; root creeping widely through the loose sand. It flowers in July and August, until late in the autumn.—Native of Europe, the Levant, and the Cape of Good Hope. It has been found between Penzance and Market-Jew in Cornwall.

30. Panicum Umbrosum; *Shady Panic Grass.* Spikes about four, remote; florets in pairs, unequally pedicelled. Culm creeping, flaccid; leaves linear, lanceolate, short, naked. —Native of shady grass spots in the East Indies.

31. Panicum Filiforme; *Filiform Spiked Panic Grass.* Spikes subdigitate, approximating, erect, filiform; rachis flexuose; teeth two-flowered, one sessile; inner valve very small. Culm and leaves smooth. It is an annual grass, flowering from July to September.—Native of North America, Japan, the Cape of Good Hope, and of the Society and Easter Islands.

32. Panicum Ægyptiacum; *Egyptian Panic Grass.* Spike subdigitate, approximating, erect, filiform; rachis flexuose; teeth two-flowered, one sessile; inner valve very small. Culm and leaves smooth; culms from one to two feet high, covered with sheaths that have long hairs closely set. This very much resembles the preceding species, but its native place is not ascertained, notwithstanding its trivial name.

33. Panicum Ciliare; *Ciliated Panic Grass.* Spikes subdigitate, approximating, erect, filiform; rachis flexuose; teeth two-flowered; flowers pedicelled; outer valve ciliate. Culm and leaves hairy; height a foot and half, branched at the base; corolla quite smooth; flowers lanceolate, acute, one of them sessile. It varies with the leaves more or less hairy, and with the sheaths and joints hairy and naked. It resembles the thirty-first species so much that they may be easily mistaken for each other.—Native of Java and China.

34. Panicum Lineare; *Linear-spiked Panic Grass.* Spikes digitate, in fours, or thereabouts, linear; florets solitary, directed one way, awnless. Culms prostrate, even, branched. —Native of both Indies.

35. Panicum Cimicinum; *Bug Panic Grass.* Panicle umbelled: racemes in fours, one of the calicine glumes ciliate; leaves lanceolate, even, ciliate. Root annual; culms a foot high, upright or ascending, even.—Native of the East Indies.

36. Panicum Distachyon; *Distich-spiked Panic Grass.* Spikes in pairs, directed one way, even. Culms somewhat branched, a foot high, narrower; leaves short, rugged at the edge; antheræ yellow.—Native of the East Indies.

37. Panicum Squarrosum; *Scaly Panic Grass.* Spikes in pairs, horizontal; involucres of the flowers squarrose. Culms decumbent; leaves short, clustered, tomentose, as are also the sheaths; peduncle elongated, erect, naked, terminated by two spikes, diverging horizontally, directed one way, squarrose. A bundle of barren flowers terminates the spike. The appearance and structure are so singular, that it seems to constitute a distinct genus. Annual.—Native of the East Indies, found commonly in the sands of Malabar during the rainy season.

38. Panicum Hispidulum; *Hispid Panic Grass.* Spikes binate and ternate, erect; calices hispid, two-awned.—Native of the East Indies.

39. Panicum Compositum; *Compound Spiked Panic Grass.* Spike compound; spikelets linear, directed one way; florets in pairs, remote; calices awned. Culm creeping, leafy, rising, filiform, tender, simple; leaves lanceolate, wider than the rest.—Native of Ceylon and the Society Isles in the Southern Ocean.

40. Panicum Elatius; *Tall Panic Grass.* Spike compound; spikelets oblong, scattered, pressed close; florets crowded; calices mucronate, awned. Culm upright, stiff, six feet high; leaves long. It very much resembles the preceding species.—Native of Malabar.

** *Flowers panicled.*

41. Panicum Dichotomum; *Dichotomous Panic Grass.* Panicles simple; culm branched, dichotomous. In stature this grass emulates a small tree; simple below, and fascicled above.—Native of Virginia.

42. Panicum Ramosum; *Branched Panic Grass.* Panicle with simple branches; flowers in threes or thereabouts, lower, subsessile. Culm branched; leaves with even sheaths, striated, ciliate at the edge and throat.—Native of the Indies.

43. Panicum Deustum; *Burnt Panic Grass.* Panicle spreading; flowers solitary; glumes smooth, purple at the tip.—Native of the Cape.

44. Panicum Coloratum; *Coloured Panic Grass.* Panicle spreading; stamina and pistilla coloured. Culm branched; according to Jacquin, quite simple; glumes one-flowered, awnless, ovate, green and purple, eight-grooved. Root perennial. It flowers in July and August.—Native of Egypt.

45. Panicum Repens; *Creeping Panic Grass.* Panicle rod-like; leaves divaricating. Culms creeping, a foot high, ascending: perennial.—Native of banks of rivers in the Levant; and cultivated in the East Indies.

46. Panicum Ischœmoides; *White Panic Grass.* Panicle erect, contracted; calices two-flowered, polygamous, acute. Culm simple; leaves distich, rigid; branches of the panicle few, naked, stiff, straight half way, but the flowering part flexuose; flowers for the most part in pairs, one of them pedicelled; seed ovate, flattish.—Very common in Malabar on the borders of ponds.

47. Panicum Remotum; *Distant Panic Grass.* Branches of the panicle three-sided; florets subgeminate, one-pedicelled. Culm branched, four-cornered, compressed; leaves linear, from four to six inches long, narrow, naked; branches of the panicle capillary, remote, solitary, about eight in number; seed white, ovate, flattish.—Native of Tranquebar.

48. Panicum Aristatum; *Awned Panic Grass.* Culm creeping, rooting; branches of the panicle undivided; florets in pairs, sessile, awned; leaves lanceolate, naked, short; corolla lanceolate, white, with equal valves.—Native of China.

49. Panicum Miliaceum; *Millet Panic Grass.* Panicle loose, flaccid; sheaths of the leaves rough-haired; glumes mucronate, nerved. It rises with a reed-like channelled stalk, from three to four feet high: at every joint there is one reed-like leaf, joined on the top of the sheath, which embraces and covers that joint of the stalk below the leaf, and is clothed with soft hairs; the leaf has none, but has several small longitudinal furrows, running parallel to the midrib; the stalk is terminated by a large loose panicle, hanging on one side. Mr. Miller mentions two varieties, one with white seeds, the other with black seeds, but not differing in any other particular. He also mentions another species, which has a more slender stalk, about three feet high; the sheaths have no hair, but are channelled; the leaves are shorter; the panicle stands erect, and the chaff has shorter awns or beards. Loureiro mentions a variety with brownish or dusky-red seeds. —Native of the East Indies and China, where, as well as in the south of Europe, it is cultivated as an esculent grain. The seeds, which vary in their colour, are sometimes used in the manner of barley, to make a drink which is good in fevers, and against heat of urine; it is also slightly astringent. This

grain is seldom cultivated in any considerable quantity in England, though the seeds ripen very well, and are well adapted for feeding poultry. They must be sown in the beginning of April upon a warm dry soil, but not too thick, because these plants divide into several branches, and should have much room; and when they come up, they should be cleared from weeds, after which they will in a short time get the better of them, and prevent their future growth. In August the seeds will ripen, when it must be cut down, and beaten out, as is practised for other grain: but the birds will devour it as soon as it begins to ripen, unless it be protected from them by very effectual precautions.

50. Panicum Antidotale; *Medicinal Panic Grass.* Panicle nodding; calices two-flowered, polygamous, acute. Culm erect, very much branched; root perennial, stoloniferous; leaves rough at the edge, and on the larger nerves, but less so.—It is cultivated in Malabar, where it never produced seed, but is increased by offsets or runners. The natives there use it, particularly in ulcers of the nose, and as a discutient in other cases, either simply bruised, or made into a cataplasm, as Kœnig reports.

51. Panicum Notatum; *Black-spotted Panic Grass.* Panicle spreading; axils marked; leaves lanceolate, ciliate. This is a tall grass, with a slender culm, and black dots.—Native of Sumatra.

52. Panicum Muricatum; *Muricated Panic Grass.* Panicle spreading; flowers solitary, muricated. Culm rooting, ascending, a foot and half high; leaves short, lanceolate, with white scattered hairs.—Native of the East Indies.

53. Panicum Capillare; *Capillary Panic Grass.* Panicle capillary, erect, spreading; peduncles strict; calices acuminate, even; sheaths of the leaves very hirsute. This grass resembles the *Poa Capillaris*, but it is entirely hirsute. Annual, flowering from July to August.—Native of Virginia and Jamaica.

54. Panicum Flexuosum; *Flexuose Panic Grass.* Panicle capillary, spreading; peduncles flexuose; calices ovate; beard of the joints reflex. Culms decumbent, branched, slightly hairy. Retzius mentions a variety that is wholly smooth, found every where in the rice-fields.—Native of the East Indies.

55. Panicum Grossarium. Branches of the panicle simple; flowers in pairs, with one of the pedicels very short, the other the length of the flower. Culm simple or branched, two feet high and more.—Native of Jamaica and Japan.

56. Panicum Maximum; *Large Panic Grass*, or *Guinea Grass.* Panicle compound, capillary, spreading; branches racemed; knots of the joints and sheaths hirsute at the base. Root creeping, perennial; culms from five to ten feet high, upright, simple, even; leaves lanceolate, towards the top convolute and sharp, smooth, except at the edge which is rugged, and at the base which is rough-haired.—Native of the West Indies; said to have been originally brought from the coast of Africa. It is much esteemed in Jamaica both for sheep and cattle; and flowers chiefly in October.—This is increased in the same manner as the twenty-first species, but does not require near so much moisture, and is reckoned a more hearty fodder. It is not so much cultivated as it ought to be. The lands about the towns are too subject to drought, to produce it in any perfection; and in the other parts of the country they are too indolent to be at the trouble of planting it; not considering how much time and labour is lost in seeking for other fodder, which is not so good, and cannot so easily be obtained; nor do they consider the losses they sustain in stock, for the want of abundance of wholesome food. For further particulars, see *Holcus Pertusus.*

57. Panicum Nemorosum; *Wood Panic Grass.* Panicle simple; branches distant, erect; florets remote, scattered, ovate-acuminate. Culm decumbent, jointed; sheaths and neck hairy; roots and radicles very long, filiform; leaves distich, obliquely elliptic at the base, unequal on the sides, terminated by a lanceolate point, quite entire, somewhat waved, very thin and very finely streaked, smooth underneath, hairy above; antheræ purple.—Native of Jamaica and Hispaniola.

58. Panicum Acuminatum; *Sharp-leaved Panic Grass.* Panicles simple, shorter than the leaves; branches capillary, diffused; spikelets remote, obovate. Culm decumbent, jointed, branched; leaves lanceolate-subulate, erect; sheaths villose. This grass is a span in height.—Native of sandy fields on the mountains of Jamaica.

59. Panicum Rigens; *Stiff-panicled Panic Grass.* Panicle simple, rigid, spreading. Culm branched, decumbent; leaves horizontal, rugged. This grass is distinguished by its rigidity.—Native of the high mountains of Jamaica.

60. Panicum Fuscum; *Brown Panic Grass.* Panicle simple; branches erect; florets directed one way, in pairs, on a shorter pedicel. Culm erect, subdivided; leaves broad-lanceolate; height from one to two feet; sheaths long, with a contracted ligule, appearing somewhat hirsute when magnified; pedicels now and then two-flowered.—Native of the boggy pastures of Jamaica.

61. Panicum Laxum; *Loose Panic Grass.* Panicle simple, nodding; branches capillary; spikelets approximating, alternate, pressed close. Culms simple, filiform, flaccid; leaves linear-lanceolate; height from two to four feet.—Native of Jamaica, in dry woods; flowering at the end of the year.

62. Panicum Latifolium; *Broad-leaved Panic Grass.* Panicle with racemes, lateral, simple; leaves ovate-lanceolate, hairy at the neck.—Native of North America.

63. Panicum Flavescens; *Yellow Panic Grass.* Panicle simple, erect, stiff; branches subfastigiate, the lowest opposite; spikelets approximating, directed one way; pedicels two-flowered; height three or four feet. Culm simple, erect, round at top, compressed, and pubescent. This species is singular in the colour, being constantly yellow, which is not the case with the rest.—Native of Jamaica.

64. Panicum Diffusum; *Diffused Panic Grass.* Panicle somewhat simple, capillary, spreading; spikelets distant. Culm decumbent, simple; leaves linear, hairy at the neck; sheaths striated, villose at the neck and throat; knots purple; branches of the panicle alternate.—Common in dry places in the West Indies.

65. Panicum Oryzoides; *Rice-like Panic Grass.* Panicle almost simple; branches erect; florets somewhat remote, ovate-acute. Culm erect, undivided; leaves broad-lanceolate, rounded at the base; sheaths even. This is distinguished by the spikelets being much larger than in any of the other species.—Native of mountain woods in the southern part of Jamaica.

66. Panicum Clandestinum; *Hidden Panic Grass.* Racemes hidden within the sheaths of the leaves; culm dichotomous, branched.—Native of Pennsylvania.

67. Panicum Arborescens; *Tree Panic Grass.* Stem arborescent; panicle very much branched; leaves ovate-oblong, acuminate. This grass contends for height with the loftiest trees in the East Indies, though the culm is scarcely wider than a goose-quill. It flowers in March and April.—Native of the East Indies.

68. Panicum Curvatum; *Crook-chaffed Panic Grass.* Panicle racemed; glumes curved, obtuse, nerved. Culms filiform, even.—Native of the East Indies.

69. Panicum Virgatum; *Long-panicled Panic Grass.* Panicle rod-like; glumes acuminate, even, outmost gaping. This is a very tall grass, with a very large diffused panicle. —Native of Virginia, and other parts of North America.

70. Panicum Patens; *Spreading Panic Grass.* Panicle oblong, flexuose, capillary, spreading; calices two-flowered; leaves linear-lanceolate.—Native of the East Indies. This, or one like it, is also found in Portugal.

71. Panicum Trigonum; *Triangular-seeded Panic Grass.* Panicle erect; peduncles two-flowered; calices obtuse, hispid, one-flowered; seeds three-cornered. Culms a span high, prostrate, leafy, rooting.—Native of the East Indies.

72. Panicum Pallens; *Pale Panic Grass.* Panicle compound, ovate; branches clustered, erect; spikelets ovate, subulate. Culm subdivided, jointed; leaves ovate, lanceolate; sheaths ciliate on the neck and at the edge.—Native of Jamaica.

73. Panicum Lanatum; *Woolly Panic Grass.* Panicle compound, erect, smooth; spikelets ovate. Culm branched; leaves ovate-lanceolate, pubescent; sheaths languinose, hirsute.—Native of Jamaica.

74. Panicum Arundinaceum; *Reedy Panic Grass.* Panicle compound, spreading; branches and branchlets stiff, capillary; spikelets roundish. Culm subdivided, jointed; leaves broad-lanceolate, acuminate, rigid.—Native of Jamaica, in the high mountains near cold springs in St. Andrew's Parish.

75. Panicum Glutinosum; *Glutinous Panic Grass.* Panicle compound, spreading; branches flexuose; spikelets pedicelled, distant, glutinous. Culm erect, simple; leaves broader. The great clamminess of the spikelets, whence its trivial name, is peculiar to this species.—Native of Jamaica, in the southern parts, in the woods of the highest mountains.

76. Panicum Radicans; *Rooting Panic Grass.* Panicled: culm branching, rooting; the base of the leaves and the sheaths longitudinally ciliate. This grass is a foot high, slender, smooth.—Found by Wennerberg near Canton in China.

77. Panicum Trichoides; *Hair-like Panic Grass.* Panicle very much branched, spreading; branches and branchlets subdivided, capillary. Culm declined, jointed; leaves ovate-lanceolate, very smooth. Dr. Patrick Browne calls this the *Smaller Wood Grass*, and says it is very common in the woods of Jamaica, agreeing for the most part with the Guinea Grass, both in the arrangement and formation of its flowers. The stalks and leaves are excellent fodder for all sorts of cattle, and the seeds serve to feed small birds.

78. Panicum Divaricatum; *Straddling Panic Grass.* Panicles short, awnless; culm very much branched, and extremely divaricating; pedicels two-flowered, one shorter. —Native of Jamaica.

79. Panicum Hirsutum; *Shaggy Panic Grass.* Panicle compound, capillary, spreading. Culms and sheaths bristly, hirsute; leaves lanceolate, acuminate, nerved, strict; valves of the calix ovate, acuminate, concave, striated; outer less by half; stigmas feathered, whitish.—Native of Jamaica.

80. Panicum Elongatum. Plant smooth; panicles in pairs, pyramidal, lateral, elongate-pedunculate, terminal; little branches alternate, divaricate; glumes alternate, oblong, acute, pedicellated, coloured; leaves long; neck somewhat bearded; stem compressed.—Grows in ditches, and near ponds, from New Jersey to Virginia. It is a very handsome grass, sometimes five feet high: the colour of the panicle is dark purple mixed with green.

81. Panicum Strictum. Panicles solitary, shorter than the terminal leaf; branches simple, flexuose; glumes alternate, pedunculated, obovate, turgid; little valves with many striæ, acute; leaves linear; sheaths very hairy.—Grows on the banks of the Delaware, and also in Pennsylvania.

82. Panicum Fusco-rubens. Racemes linear, virgate; glumes clavate, coloured.—Grows in the rice-fields of Georgia, and flowers in August.

83. Panicum Striatum. Panicles oblong; glumes somewhat large, glabrous, green, beautifully striated.—Grows in Carolina.

84. Panicum Nitidum. Panicles capillaceous, ramose; glumes striated, pubescent; seeds shining; leaves remote, lanceolate-linear, bearded at the neck; stalk glabrous.—A common North American species.

85. Panicum Scoparium. Panicles erect, composite, setaceous, very branchy; glumes obovate, pubescent; leaves lanceolate, villose.—Grows in the dry swamps of Carolina.

86. Panicum Nodiflorum. Panicles very small, lateral, and terminal; glumes ovate, pubescent; leaves narrow, somewhat short, bearded at the neck.—Grows in dry fields from Pennsylvania to Carolina, and flowers in July.

87. Panicum Proliferum. Plant very glabrous; panicles oblong, erect, lateral, and terminal; glumes oblong, acute, striated; stalk branchy, dichotomous.—Grows in rich soil, in woods, and on edges of ditches, from Pennsylvania to Carolina, and flowers in July and August.

88. Panicum Pubescens. Plant erect, very branchy, pubescent; panicles small, with few flowers, lax, sessile; glumes globose-ovate, subpedicellated, pubescent.—Grows in shady rich woods from Virginia to Carolina, and flowers in July.

89. Panicum Laxiflorum. Panicles open, lax, pilose; glumes rare, obtuse, pubescent.—A North American plant.

90. Panicum Anceps. Plant erect; branches of the panicle simple, interruptedly racemulose; leaves long; sheaths compressed, pilose.—Grows in the shady wet woods of Carolina.

91. Panicum Melicarium. Plant feeble, very glabrous; panicle slender, long; branchlets rare; glumes membranaceous, with subequal lanceolate valves; leaves narrow, long.—Grows in Carolina and Georgia, flowering in July and August.

Pansies. See *Viola.*

Papaver; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix*: perianth two-leaved, ovate, emarginate; leaflets subovate, concave, obtuse, caducous. *Corolla:* petals four, roundish, flat, spreading, large, narrower at the base, alternately less. *Stamina:* filamenta numerous, capillary, much shorter than the corolla; antheræ oblong, compressed, erect, obtuse. *Pistil:* germen roundish, large; style none; stigma depressed, peltate, flat, radiate. *Pericarp:* capsule crowned with the large stigma, one-celled, half many-celled, opening by many holes at the top under the crown. *Seeds:* numerous, very small; receptacles longitudinal plaits, the same number with the rays of the stigma, fastened to the wall of the pericarp. *Observe.* The pericarp is either globular or oblong, and differs in the rays of the stigma. The primary division of the species is to be taken from the smoothness and roughness of the pericarp. Essential Character. *Calix:* two-leaved. *Corolla:* four-petalled. *Capsule:* one-celled, opening by holes under the permanent stigma.—All the plants of this genus are propagated by seeds; but those which have perennial roots may be also propagated by offsets. The best time for sowing the seeds is in September, when they will more certainly grow; and those sorts which are annual will make larger plants, and flower better, than when they are sown in the spring. The best way is to sow the seeds of the annual kinds in the places where they are to remain, and to thin the plants where they are too close: those of the large kinds should not be left nearer to each other than a foot and a half, and the

smaller sorts may be allowed above half that space. The culture they will require after this, is only to keep them clean from weeds.——The species are,

* *With bristly Capsules.*

1. Papaver Hybridum; *Round Prickly-headed Poppy.* Capsules subglobular, torose, hispid; stem leafy, many-flowered. The leaves are much smaller than those of the common Corn Poppy, and are cut into much finer segments. The stalks are slender, little more than a foot high, and not so branching as in the fifth species. The flowers are not so large, and of a deep purple colour, seldom lasting more than a whole day; petals small, dark dirty scarlet; filamenta deep purple; antheræ pleasant blue. It flowers in June and July.—Native of some of the southern parts of Europe, and of England, among corn: it is found near Norwich; near Wells in Norfolk; in the parks at Oxford, and Eynsham, in Oxfordshire; and in the neighbourhood of Durham.

2. Papaver Argemone; *Long Rough-headed Poppy.* Capsules club-shaped, hispid; stem leafy, many-flowered; leaves finer cut and smaller than those of the common sort, but not so fine as those of the preceding; stalks not half so high as either, seldom having many branches; flowers not half so large, of a copper colour, and falling away in a few hours. They appear in May, and are succeeded by long slender channelled capsules, filled with small black shrivelled seeds. The divisions of the leaves are finer in this than in any of the other Poppies; the petals in general grow more upright, and instead of having the edges falling over each other, are usually a little distant; the filamenta are uncommonly dilated at top, not at the base, as Haller asserts; and the antheræ stand on a very slender pedicel, placed on the top of each filamentum. It is annual, and, like most of the other Poppies, usually grows in corn-fields, and is not uncommon about London. It flowers at the beginning of June or July, and is often overlooked from the extreme fugacity of its petals.—It is a native not only of most parts of Europe, but also of the Levant.

3. Papaver Alpinum; *Alpine Prickly-headed Poppy.* Capsule hispid; scape one-flowered, naked, hispid; leaves bipinnate. The whole plant when fresh has a strong smell of musk. Stems naked, simple, with a bundle of leaves at the base. It is a small perennial plant, hairy all over, and grows in high rocky places, which are exposed to the wind, and bare of grass. Scopoli remarks, that the variety with a yellow flower is not so hairy. Dillenius describes the variety with a white flower to be larger and more hairy, and with paler leaves.—Native of Switzerland, Austria, Carniola, Dauphiny, Piedmont, and Silesia.

4. Papaver Nudicaule; *Naked-stalked Prickly-headed Poppy.* Capsules hispid; scape one-flowered, naked, hispid; leaves simple, pinnate-sinuate. Roots slender, whitish, fibrous, annual or biennial; root-leaves many, hispid, the lowest broader and shorter, less deeply divided into fewer and broader segments; the leaves next above are divided into many narrower and longer segments, glaucous, green, especially underneath. From among these leaves rises a single naked stalk, sometimes two, a long span or a foot in height, somewhat glaucous, hispid, sustaining one flower of a middling size. The flower has a fine sweet smell like the Jonquil, especially morning and evening. It varies with white and yellow flowers, which appear from June to August.—Native of Norway and Siberia.

** *With smooth Capsules.*

5. Papaver Rhœas; *Corn* or *Red Poppy.* Capsules urn-shaped, smooth; stem hairy, many-flowered; leaves pinnatifid, gashed. Stem from one to two feet high, upright, round, branched, purplish at bottom, with spreading hairs, bulbose at the base; peduncles long, round, upright, one-flowered, the hairs on it spreading horizontally; petals bright full scarlet; stigma convex, with ten or twelve rays of a purple colour; seeds dark purple. There is a variety with an oval black shining spot at the base of each petal, from which many beautiful garden varieties originate; some have double flowers, some white, others red bordered with white, and variegated. The petals give out a fine colour when infused, and a syrup prepared from this infusion is kept in the shops, more for the sake of the colour than of any active principle the flowers possess, although this species partakes in a small degree of the soporific quality of the Somniferum. The capsules, as in that, contain a milky juice of a narcotic quality, but the quantity is inconsiderable. An extract from them has been successfully employed as a sedative; and some foreign practitioners even prefer this extract to opium. It is said to be very excellent in pleurisies, quinsies, and all disorders of the breast. A strong tincture may be drawn from the flowers with wine; and this is much better than the syrup, for that is too much loaded with sugar to be given in sufficient doses.—Native of every part of Europe, the Levant, Japan, &c. It is the commonest of all the species in England, especially in corn-fields, also on dry banks, and on walls, varying its foliage in such situations, but still retaining the urn-shaped capsule and spreading hairs. It flowers from June to August. Being so common a weed, it has many provincial names in English, besides its more classical ones of *Corn Poppy*, and *Red* or *Scarlet Poppy*; such as *Corn Rose*, *Cop Rose*, or *Cup Rose*, in Yorkshire; and *Canker* or *Canker Rose*, or *Redweed*, and also *Headwark*, in the eastern counties. The quantities of this weed visible on some lands is a disgrace to the farmer, which the brilliancy of the flowers proclaims to the country round. Being an annual, it is easily destroyed by good husbandry; but, like other oily seeds, it will lie long in the ground without corrupting, and is even said to have vegetated after having been twenty-four years buried. In Norfolk, hogs are frequently turned upon it, and will eat it out with little or no damage to the wheat. Others first feed with sheep, then with cattle, till April, taking them off when it rains much, if the land is not very light. Upon dry soils, which are most subject to Poppy, it is the method with some to plough tare and rape land for wheat, in the beginning or middle of September, in order to sow in the middle of October, as the harrowing kills the Poppy; and in putting in the seed they like to tread much with oxen or sheep. Another way is to tread with oxen in March, which is thought better against the Poppy than doing it at sowing. This treading may destroy the present crop of Poppy, but the hoard of seed remains in the ground to come up on every ploughing. The only way to destroy such weeds effectually, is to make them germinate by bringing them near the surface, and then to cut and tear them with the plough, scuffler, or harrow, according to circumstances.

6. Papaver Dubium; *Long Smooth-headed Poppy.* Capsules oblong, smooth; stem many-flowered, the bristles pressed close; leaves pinnatifid, gashed. This so closely resembles the preceding species, that it is often mistaken for it. But the capsules of this are long and slender; the hairs on the peduncle are finer, and pressed upwards close to it; on the young peduncles they assume a shining silvery white appearance, which is very beautiful; on the other parts of the plant the hairs spread out, the stalks and leaves are much paler, and the flowers much smaller, and less intensely red. Dr. Withering also remarks, that a strict attention to the proportionate length and breadth of the capsule, and to

the hairs of the peduncle, being laid close or spreading, will always distinguish this species from the fifth. He also mentions a variety, which, if it be not indeed a distinct species, seems to be an intermediate plant between them both. It is found about Shankline Chine, and in pastures in various parts of the Isle of Wight.—This species is an annual, and a native of several parts of Europe. It is the commonest species in North Britain; and in Battersea fields, where the soil is light, Mr. Curtis found it nearly as common as the preceding species. It is not unfrequently found on walls, and about Cambridge, Oxford, Stockwell in Surry, and Bocking in Essex.

7. Papaver Somniferum; *Common White Poppy*. Calices and capsules smooth; leaves embracing, gashed; stalks large, five or six feet high, branching; flowers terminating, whilst enclosed in the calix hanging down, but before the corolla expands becoming erect. The calix is composed of two large, oval, grayish leaves, that separate and soon drop off. The corolla is composed of four large, roundish, white petals, of short duration, and succeeded by large roundish heads as big as oranges, flatted at top and bottom, and having an indented crown or stigma. The seeds are white. There are several varieties, differing in the colour and multiplicity of their petals, which are preserved in gardens for ornament; but that with single flowers only is cultivated for use. The Common Black Poppy has stalks about three feet high, smooth, and dividing into several branches; leaves large, smooth, deeply cut or jagged on their edges, and embracing; petals purple, with dark bottoms, succeeded by oval smooth capsules filled with black seeds, which are sold under the name of Maw seed. There are many varieties of this with large double flowers, variegated of several colours, red and white, purple and white, and some finely spotted like Carnations: there are few plants, the flowers of which are so handsome; but having an offensive scent, and being of short duration, they are not much regarded.—This is the plant from which Opium is obtained. It is also called Opium Thebaicum, from being anciently prepared chiefly at Thebes, and has been a celebrated medicine from the remotest times. It differs from Meconium, which was made by the ancients of the expressed juice or decoction of the Poppies. Opium is imported into Europe in flat cakes, covered with leaves to prevent their sticking together: it has a reddish brown colour, and a strong peculiar smell: its taste at first is nauseous and bitter, but soon becomes acrid, and produces a slight warmth in the mouth: a watery tincture of it forms an ink with a chalybeate solution. According to the experiments of Alston, it appears to consist of about five parts in twelve of gummy matter, four of resinous matter, and three of earthy or other indissoluble impurities. The use of this famous medicine, though not known to Hippocrates, can be clearly traced back to Diogorus, who was nearly his contemporary, and its importance has ever since been gradually advanced. Its extensive practical utility has however not long been well understood; and in this country perhaps may be dated from the time of Sydenham. It is the chief narcotic now employed; it acts directly upon the nervous power, diminishing the sensibility, irritability, and mobility of the system; suspending, according to the idea of an ingenious author, the motion of the nervous fluid to and from the brain, and thereby inducing sleep, one of its principal effects. From this sedative power of Opium, by which it allays pains, inordinate action, and restlessness, it naturally follows, that it may be employed with great advantage in a variety of diseases. Indeed there is scarcely any disorder in which, under some circumstances, its use is not found proper; and though in many cases it fails to procure sleep, yet if taken in a full dose, it occasions a pleasant tranquillity of mind, and a drowsiness approaching to sleep, which always refreshes the patient. But, besides the sedative power, it is also known to act more or less as a stimulant, exciting the motion of the blood; and this increased action has been ingeniously and rationally ascribed to that general law of the animal economy by which any noxious influence is resisted by a consequent re-action of the system. By a certain conjoined effort of this sedative and stimulant effect, Opium has been thought to produce intoxication; a quality for which it is much used in the Eastern countries. In the most continued fevers of this climate, though originating from contagion, or from whatever cause, there is generally at the beginning more or less of inflammatory diathesis; and this, while it continues, would forbid the use of Opium, which might prove dangerous. Its use is also forbidden in the more advanced state of this fever, whenever topical inflammation of the brain is ascertained, which sometimes exists, and produces delirium, though other symptoms of the nervous and putrid kind prevail. But when irritation of the brain is not of the inflammatory kind, and debility has made much progress, or where delirium is accompanied with spasmodic affections, Opium is a sovereign remedy, and may be employed in large doses every eight hours, unless a remission of the symptoms and sleep take place. In intermittent fevers, Opium in combination with other medicines was much used by the ancients; but since the introduction of Peruvian bark it is seldom trusted to for the cure of these disorders: it has however been strongly recommended as an effectual means of preventing the recurrence of the febrile paroxysms: and has been given before the fit, in the cold stage, in the hot stage, and during the interval, with the best effects, producing immediate relief, and, in short, curing the patient without leaving those abdominal obstructions which have been ascribed to the bark; but in these fevers the best practice seems to be that of uniting Opium with the bark, which enables the stomach to bear the latter in larger doses, and adds considerably to its efficacy. When Opium is so managed as to produce sweat, it will tend to remove an inflammatory state of the system, and may generally prove useful; a notable instance of this we observe in the cure of acute rheumatism by means of Dover's powder. In the small-pox, Opium, since the time of Sydenham, has been very generally and successfully prescribed, especially after the fifth day of the disease; but during the first stage of the eruptive fever we are told that it always does harm; an opinion, says Dr. Woodville, which our experience at the small-pox hospital warrants us to contradict. In hæmorrhages, the use of Opium is inferred from its known effects in restraining all excretions except that of sweat; but unless the hæmorrhages be of the passive kind, or unattended by inflammation, it may produce considerable mischief. In dysentery, Opium may be occasionally employed to moderate the violence of the symptoms. In diarrhœa, when the acrimony has been carried off by a continuance of the disease, it is a certain and efficacious remedy. In colic, it is employed with laxatives, and no doubt often prevents inflammation by removing the spasm. Opium has been lately recommended in venereal cases; and instances have been adduced in which it has succeeded when mercury has failed: but few practitioners would venture trusting to Opium alone in these complaints. Opium is successfully employed in tetanus, and in other spasmodic and convulsive cases. Respecting the external use of Opium, authors are not agreed; some contending, that when applied to the skin it allays pain

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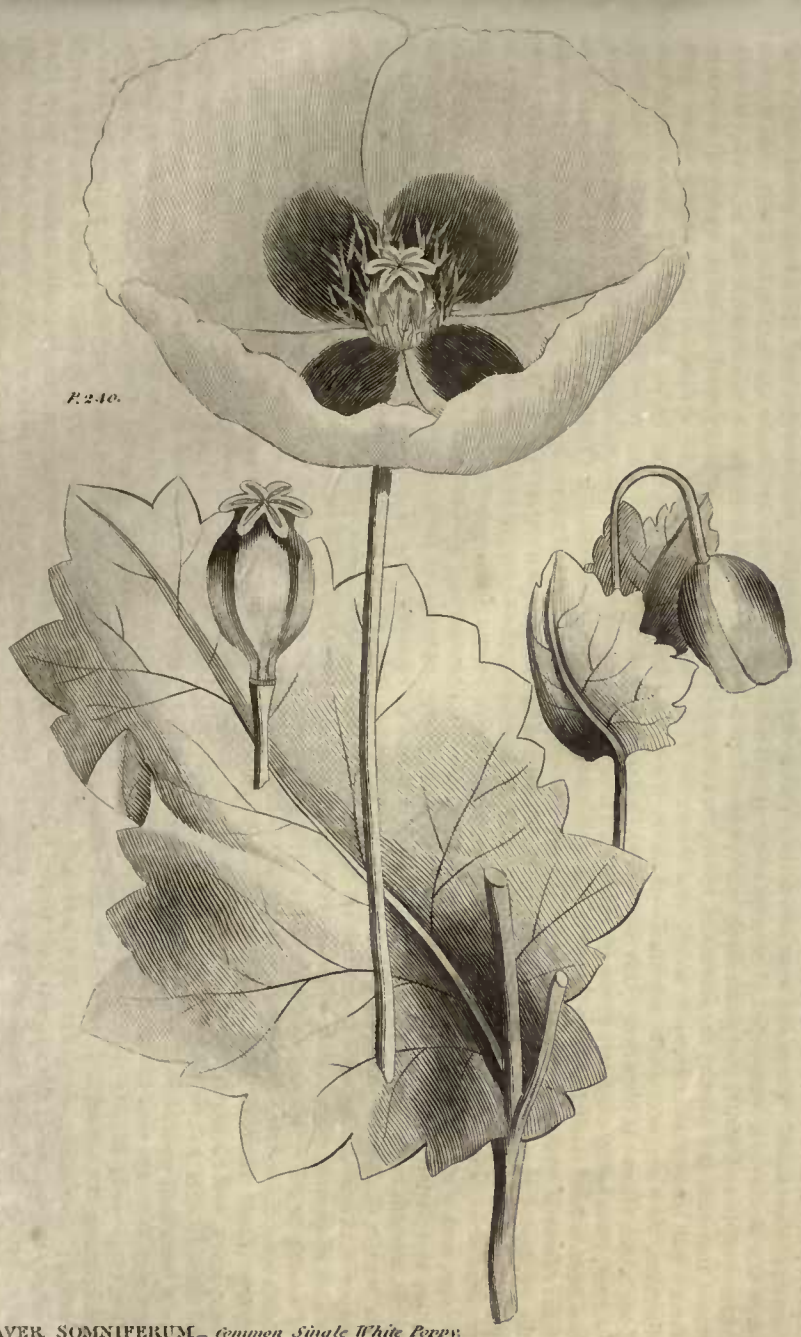

PAPAVER SOMNIFERUM – *Common Single White Poppy.*

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PASSIFLORA CŒRULEA – *Common or Blue Passion Flower.*

D. W. Campbell sc.

H. Fisher, Son & Cº. London. 1828.

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and spasm, and procures sleep; while others affirm, that when thus applied it has no effect whatsoever. Applied to the naked nerves of animals, it produces torpor and loss of power in all the muscles with which the nerves communicate. The officinal preparations of this drug are Opium Purificatum, Pilula Exopio, Pulvis Opiatus, Tinctura Opii, and Tinctura Opii Camphorata. It also enters into the Pulvis Sudorificus, Balsamum Anodynum, Electuarium Japonicum, Pulvis Ecreta Composita, &c. The requisite dose of Opium varies in different persons, as well as in different states of the same persons. A quarter of a grain in one adult will produce effects which ten times the quantity will not do in another; and a dose that might prove fatal in cholera or colic, would not be perceptible in many cases of mania or tetanus. The lowest fatal dose to those unaccustomed to it, seems to be about four grains; but a dangerous dose is so apt to occasion vomiting, that it has seldom time to cause death. When given in too small a dose, it often produces disturbed sleep, and other unpleasant consequences; and on the other hand a small dose will sometimes produce sound sleep and alleviation of symptoms, when a larger one would not have succeeded. Its general operation is supposed to last about eight hours. It is well known, that by continued habit Opium may be taken in large quantities; indeed an instance is recorded, in which it was increased to ten drachms a day. About twenty drops of the Tinctura Thebaïca, or Laudanum, are considered as nearly equivalent to a grain of Opium. Natives of the eastern countries, who are addicted to the use of it, will sometimes take incredible quantities. The heads or capsules of this plant are also powerfully anodyne; and when boiled in water, they impart their narcotic juice. The liquor, when strongly pressed out, suffered to settle, clarified with whites of eggs, and evaporated to a due consistence, yields an extract possessing the virtues of Opium, but requiring to be given in double the dose. It is said not to occasion that nausea and giddiness which are the usual effects of Opium. It is convenient to prepare the syrup from this extract, by dissolving one drachm in two pounds and a half of simple syrup. The Syrupics Papaveris Albi, as directed by both colleges, is an useful anodyne, and often succeeds in procuring sleep when Opium fails; it is also more especially adapted to children. White Poppy heads are also used externally in fomentations, either alone, or more frequently added to the Decoctum Profomento. The seeds possess not any narcotic power; they consist of a simple farinaceous matter, united with a bland oil, and are eaten as food in some countries.——In addition to the above, the remarks of other medical gentlemen are subjoined, to afford the reader every possible information on this important subject. Meyrick observes, that the heads or seed-vessels, are the parts to be made use of. Syrup of Diacodium is a very strong decoction of them, boiled up to a due consistence with sugar. This syrup is a gentle narcotic, easing pain, and causing sleep; half an ounce is a full dose for a grown person, and for younger subjects the quantity must be diminished accordingly. The seeds, beaten into an emulsion with barley-water, are excellent for strangury and heat of urine; but they have none of the sleepy virtues of the syrup, nor of the other parts or preparations of the Poppy. Opium is nothing more than the milky juice of this plant concreted into a solid form. It is procured by wounding the heads, when they are almost ripe, with a five-edged instrument, which makes as many parallel incisions from top to bottom; and the juice which flows from these wounds is the next day scraped off, and the other side of the head wounded in like manner. When a quantity of the juice is in this manner collected, it is worked together with a little water, till it acquires the consistence and colour of pitch, after which it is fit for use. Opium has a faint disagreeable smell, and a bitterish, hot, biting taste: taken in proper doses, it commonly produces sleep, and a short respite from pain; but great caution is required in the administration of it, for it is a very powerful, and consequently, in unskilful hands, a dangerous medicine. It relaxes the nerves, abates cramps and spasmodic complaints, even those of the more violent kind; but it increases paralytic disorders, and all such as proceed from weaknesses of the nervous system. It incrassates thin serous acrid humours, and thus proves frequently a speedy cure for catarrhs and tickling coughs, but must never be given in phthisical or inflammatory complaints; for it dangerously checks expectoration, unless its effects are counteracted by the addition of ammoniac or squills; and by producing a fulness and distention of the whole habit, it exasperates all inflammatory symptoms, whether external or internal. It promotes perspiration and sweat, but checks all other evacuations; and is good to stop purgings and vomitings, but this is to be effected only by small doses, carefully and judiciously given. With regard to the dose, half a grain, or at most a grain, is in all common cases a sufficient quantity; and even in cases which require larger doses, it is in most cases advisable to repeat them more frequently, than to give a larger quantity at a time. An over dose of Opium occasions either immoderate mirth or stupidity, redness of the face, swelling of the lips, relaxations of the joints, giddiness of the head, deep sleep, accompanied with turbulent dreams and convulsive starting, cold sweats, and frequently death.—Opium is imported into Europe from Persia, Arabia, and other warm regions of Asia; and six hundred thousand pounds of it are said to be annually exported from the Ganges. The manner in which this drug is there collected may assist the English cultivator; we therefore insert the following detail of it. When the capsules are half grown, at sun-set they make two longitudinal double incisions, passing from below upwards, and taking care not to penetrate the internal cavity. In Persia, Kæmpfer informs us that a five-pointed knife is used for this purpose. The incisions are repeated every evening, until each capsule has received six or eight wounds: they are then allowed to ripen their seeds. If the wound were to be made in the heat of the day, a cicatrix would be too soon formed; while, on the other hand, the night dews favour the extillation of the juice, which old women, boys, and girls, collect early in the morning, by scraping it off with a small iron scoop, and deposit the whole in an earthen pot, where it is worked by the hand in the open sunshine, until it becomes of a considerable thickness. It is then formed into cakes of a globular shape, and about four pounds in weight, and laid into little earthen basins to be farther dried. These cakes are then covered over with Poppy or Tobacco leaves, and thus dried until they are fit for sale. Opium is however frequently adulterated with cow-dung, the extract of the plant procured by boiling, and various other preparations, which the rogues who use them of course keep as secret as possible.—It appears that the Poppy may be cultivated to great advantage for the purpose of obtaining Opium in Great Britain. Professor Alston of Edinburgh said long since, that the milky juice drawn by incision from Poppy heads, and thickened either in the sun or shade, even in this country, has all the characters of good Opium; its colour, consistence, taste, smell, properties, phænomena, are all the same; only, when carefully collected, it is more pure and free from feculencies. Similar remarks had been made by others; to which, says

Dr. Woodville, we may add our own; for during the same summer, we at different times made incisions in the green capsules of the White Poppy, and collected the juice, which soon acquired a due consistence, and was found, both by its sensible qualities and effects, to be very pure Opium: and the same gentleman adds, that nearly fifty years ago he frequently amused himself with slashing the green Poppy heads, and collecting a most pure and well-digested Opium from them. But the merit of first cultivating the Poppy for Opium is due to Mr. John Ball, of Williton, who in the year 1796 was rewarded by the Society of Arts, Manufactures, and Commerce, for procuring Opium in an unsophisticated state from British Poppies, and communicating the following mode of preparing it for the use of the public. When the leaves die away and drop off, the capsules or heads being then in a green state, is the proper time for extracting the Opium by making four or five longitudinal incisions with a sharp-pointed knife, about an inch long, on one side only of the head, taking care not to cut to the seeds: immediately on the incision being made, a milky fluid will issue out, which being of a glutinous nature, will adhere to the bottom of the incision; but some are so luxuriant that it will drop from the head. The next day, if the weather should be fine, the Opium will be of a grayish substance, and some almost turning black; it is then to be scraped off with the edge of a knife into pans or pots; and in a day or two it will be of a proper consistence to make into a mass, and to be potted. As soon as the Opium is all taken away from one side, make incisions on the opposite side, and proceed in the same manner. The reason of not making the incisions all round at once is, that the Opium cannot so conveniently be taken away; but every person upon trial will be the best judge. Children may with ease be soon taught to make the incisions, and take off the Opium; so that the expense will be trifling. An instrument might be made of a concave form, with four or five pointed lancets about the twelfth or fourteenth part of an inch, to make the incisions at once. Mr. Ball calculates, that supposing one Poppy to grow in one square foot of earth, and to produce only one grain of Opium, more than fifty pounds will be collected from one statute acre. But since one Poppy produces from three or four to ten heads, in each of which from six to ten incisions may be made, each incision sometimes producing two or three grains, the produce and profit would be very great. Great abatements must however be made upon all such theoretical calculations, as in our moist climate many seasons will occur, and many days in almost every summer, unfavourable to the collection of Opium. It is however, with all its disadvantages, a very important object to cultivate the Poppy for this purpose in Britain; considering the great price of foreign Opium, the increasing call for it in medicine, the adulteration of what is imported, and the employment that the collection of it will afford to females and to children. Mr. Ball adds, that in 1795, from a bed of self-sown Poppies 576 feet square, he collected four ounces of Opium, though the plants were very thick: and from a few plants that stood detached, he took from fifteen to thirty-four grains: the ground had, he observes, been well manured with rotten dung. He remarks, that the semi-double flowers, and those of a dark colour, produced the most Opium; that the heads should be about the size of a walnut, before the incisions are made; and that the foreign dried Poppy-heads are full three times as big as ours. In this observation Mr. Miller coincides; adding, that they are also of a different shape, but that the increased size is only owing to the climate, and the difference in shape arising from variety. Mr. Ball collected from one semi-double Poppy, a quantity which he supposes to be more than thirty-eight grains; but this plant had twenty-eight heads on it. He prefers the double and semi-double flowering plants to those which have single flowers; but the single Poppies, cultivated by our physic gardeners for the seed and the heads, have generally larger heads than the double Poppies cultivated in gardens. But after all, the point of most importance respecting the cultivation of the Poppy for Opium in Britain is, whether its *quality* be equal to that of foreign Opium. This has been fully ascertained by the testimony of several eminent medical gentlemen in London, who tried it in consequence of the request of the Society for the Encouragement of Arts, Manufactures, and Commerce. Dr. Latham observes, that in its sensible qualities it does not seem inferior to any; that it possesses the excellence of being perfectly clean, which must always be an advantage when given in a crude state; and that probably the purified extract of the foreign would not be superior to the English. Dr. Pearson also reports, that he found the English Opium to be equally powerful, and to produce the same effects as the best foreign preparation of this drug. Mr. Wilson not only found the English drug equal in point of strength to the best extract from foreign Opium, but far superior in flavour, which in the extract is much injured by the boiling; and free from the impurities which are so abundant in crude foreign Opium.—*Propagation and Culture.* The culture, as practised in the province of Bahar, is as follows. The field being well prepared by the plough and harrow, and reduced to an exact level surface, it is then divided into quadrangular areas, seven feet in length, and five in breadth, leaving two feet of interval, which is raised five or six inches, and hollowed out for conveying water to every area, for which purpose they have a well in each cultivated field. The seeds are sown in October or November. The plants are allowed to grow six or eight inches distant from each other, and are plentifully supplied with water. When the young plants are six or eight inches high, they are watered more sparingly; but a compost of ashes, human excrement, cow-dung, and a portion of nitrous earth scraped from the highways and old mud-walls, is strewed all over the beds. When the plants are near flowering, they are watered profusely, to increase the juice; but the capsules being half grown, and fit to collect Opium from, the plants are no longer watered. Mr. Ball advises the sowing of the seed at the end of February, and again in the second week of March, in beds three feet and a half wide, well prepared with good rotten dung, and often turned or ploughed in order to mix it well, and have it fine either in small drills three in each bed, or broad-cast; in both cases thinning out the plants to the distance of a foot from each other when about two inches high: keep them free from weeds, and they will grow well, produce from four to ten heads, and they will shew large flowers of different colours. With an instrument something like a rake, but with three teeth, the drills may be made at once. Poppies do not bear transplanting: out of four thousand which Mr. Ball transplanted, not one plant came to perfection.—Those who are curious to have fine Poppies in their gardens, carefully look over their plants when they begin to flower, and cut up all those plants, the flowers of which are not very double and well marked before they open their flowers, to prevent their farina mixing with the finer flowers, which would cause them to degenerate. The neglect of this precaution causes the flowers in so many places to degenerate, and it is often supposed to arise from the infertility of the ground.

8. Papaver Cambricum; *Welsh Poppy.* Capsules smooth, oblong; stem many-flowered, smooth; leaves pinnate, gashed.

The upper part of the stalk is naked, and sustains one large yellow flower, appearing in June, and filled with small purplish seeds.—Found in many parts of Wales, in the valleys and fields, at the foot of the hills, and by the water side; about a mile from Abbar, and in the midway from Denbigh to Guider, the house of Sir John Wynne; as also near a wooden bridge over the Dee to Balam in North Wales; and in going up the hill that leads to Bangor; and in the isle of Anglesea; on the back of Snowden, going from Carnarvon to Llanberis; as you ascend the Glyder from Llanberis; also beyond Pont Vawr; and commonly by rivulets, or on moist rocks. Dillenius found it on Chedder rocks in Somersetshire; and it has since been observed about Kendal, Kirby-Lonsdale, and Winnandermere, in Westmoreland, and at Holker in Lancashire. It requires a cool shady situation, where the plants will thrive, and produce plenty of seeds annually. If the seeds be permitted to scatter, they will come up better than when sown by hand; but if they be sown, it should be always in the autumn, for when sown in the spring they rarely succeed. The best time to transplant and part the roots of this sort is in the autumn, that the plants may be well established in their new quarters, before the dry weather comes on in the spring.

9. Papaver Orientale; *Oriental Poppy.* Capsules smooth; stems one-flowered, rugged, leafy; leaves pinnate, serrate. Root perennial, composed of two or three strong fibres as thick as a man's little finger, a foot and half long, dark brown on the outside, full of a milky juice, which is very bitter and acrid. The height of the stem is two feet and a half; it sustains at the top a very large flower, nearly a span wide, of the same colour with the Common Red Poppy. Stigmas sixteen; bristles on the stem scattered, pressed close, rough, with a prominent base; capsule smooth, crowned with the large shield of the stigma, having one cavity in the middle, but toward the periphery divided by incomplete partitions into cells, equal in number to the number of rays in the stigma, and opening not by valves, but by as many holes under the shield; seeds very numerous, kidney-form, beautifully marked with longitudinal streaks and little excavations in rows, of a russet bay colour, covering the incomplete partitions on both sides.—Native of the Levant. It flowers here in May. There are two or three varieties, differing in the colour of the flowers, and it is said that the flower is sometimes double, though with us it is always single. Tournefort says, that the Turks eat the green heads, although they are very bitter and acrid. It will thrive either in the sun or the shade, only in the latter case they flower later in the season. It will propagate very fast by its roots; so that there is no necessity for sowing the seeds, except to procure new varieties. It should be transplanted at the same season as the former; and if the seeds be sown, it should be at the same times as that, for the reasons there given.

Papaw Tree. See *Carica.*

Pappophorum; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume two-flowered, two-valved; valves long, linear, somewhat compressed, very thin, acuminate, awnless, outer a little shorter; one floret inferior, larger, sessile, bearded at the base, hermaphrodite; the other superior, less, on a short pedicel, pressed close to the back of the lower one, beardless, neuter; and above this the rudiment of a third. *Corolla:* glume two-valved, shorter than the calix; outer valve ovate, ventricose, angular, terminated by several awns, nine to fourteen, very long, straight, unequal, spreading, with its edges embracing the inner valve, which is lanceolate, acute, a little longer and narrower than the outer; nectary two-leaved, very small, with linear leaflets. *Stamina:* filamenta three, capillary; antheræ oblong. *Pistil:* germen ovate, superior; styles two, short; stigmas villose. *Pericarp:* none, except the corolla, which incloses the seed, and lets it drop. *Seed:* one, ovate, compressed, diaphanous. *Observe.* The outer glume of the lower floret is villose at the back and sides; the inner is excavated at the back, to receive the upper floret. Essential Character. *Calix:* two-valved, two-flowered. *Corolla:* two-valved, many-awned.——The species are,

1. Pappophorum Alopecuroideum. Culm branched, three or four feet high, smooth, sheathed with leaves; which are convoluted, awl-shaped, striated, shorter than the culm, the last spathaceous; panicle erect, subspiked, often a foot and half long; calix three or four flowered.—Found near Spanish Town in America.

Four other species of Pappophorum have been found in New Holland.

Papyrus. See *Cyperus Papyrus.*

Pariana; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flowers,* in whorls, digested into spikes. *Calix:* glume one-flowered, two-valved; valves short, acute. *Corolla:* two-valved, larger than the calix; valves ovate, acute, one narrower. *Stamina:* filamenta about forty, capillary, inserted into the bottom of the corolla; antheræ linear. *Female Flowers,* solitary in each whorl, fastened to the axis of the spike. *Calix:* glume two-valved; valves ovate, concave, acute. *Corolla:* two-valved, less than the calix; valves acute, hairy at the tip. *Pistil:* germen three-cornered; style long, hairy; stigmas two, villose. *Pericarp:* none, except the permanent corolla, investing the seed. *Seed:* one, three-cornered, inclosed. Essential Character. *Male Flowers,* in whorls, forming spikes. *Calix:* two-valved. *Corolla;* two-valved, larger than the calix. *Filamenta:* forty. *Female Flowers,* solitary in each whorl. *Calix:* two-valved. *Corolla:* two-valved, less than the calix. *Stigmas:* two. *Seed:* three-cornered, inclosed. ——The only known species is,

1. Pariana Campestris. This plant puts forth several straight shoots or canes, about one or two feet high, at each joint they are garnished with alternate oval weak leaves, striated throughout their whole length, smooth, glossy, greenish above, paler beneath: the footstalks are short, and are accompanied by a long split sheath, in opposite directions on each side the stalk; this sheath envelopes the stem from one joint to the other; it is crowned with reddish, long, and roughish hairs; this crown has on each side two appendices, in the form of an ear, bordered on both sides with similar hairs. The stem is terminated by a serrated spike, formed of several ranges of male flowers growing above each other. The female flower is single in the middle of each range. The spike of flowers is about two inches and a half in length.—Native of Cayenne, flowering in January.

Parietaria; a genus of the class Polygamia, order Monœcia.—Generic Character. *Hermaphrodite Flowers,* two, contained in a flat six-leaved involucre; the two opposite and outer leaflets larger. *Calix:* perianth one-leafed, four-cleft, flat, blunt, the size of the involucre halved. *Corolla:* none, unless the calix be so called. *Stamina:* filaments four, awl-shaped, longer than the flowering perianth, and expanding it, permanent; antheræ twin. *Pistil:* germen ovate; style filiform, coloured; stigma penciform, capitate. *Pericarp:* none; perianth elongated, larger, bell-shaped, the mouth closed by converging segments. *Seed:* one, ovate. *Female Flower,* one, between the two hermaphrodites, within the involucre. *Calix:* as in the hermaphrodites. *Corolla:* none. *Pistil:* as in the hermaphrodites. *Pericarp:* none;

perianth thin, involving the fruit. *Seed:* as in the hermaphrodites. Essential Character. Two hermaphrodite flowers and one female flower in a flat six-leaved involucre. *Calix:* four-cleft. *Corolla:* none. *Style:* one. *Seed:* one, superior, elongated. *Hermaphrodite. Stamina:* four. *Female. Stamina:* none. The common European Pellitories may be propagated in plenty from their seeds; if permitted to scatter them, they will fill the ground with young plants: they are difficult to collect, being thrown out of their covers as soon as ripe.——The species are,

1. Parietaria Indica; *Indian Pellitory.* Leaves lanceolate; stem erect. This resembles our common Pellitory, but is more naked; the balls of the flowers are smaller, except the bractes which are awl-shaped, not ovate; styles longer; fruits sessile, grooved.—Native of the East Indies.

2. Parietaria Officinalis; *Common Pellitory,* or *Pellitory of the Wall.* Leaves lanceolate, ovate; peduncles dichotomous; calices two-leaved. Root perennial, somewhat woody, red, fibrous, (according to Lightfoot, creeping;) stems several, nearly upright, from nine inches to a foot or more in height, very much branched, round, striated, solid, reddish, pubescent, (according to Lightfoot, rough to the touch, and adhesive;) flowers small, greenish, rough, sessile, growing in balls or clusters in the axils of the leaves; two hermaphrodites and one female in an involucre of seven leaves, (Linneus says only six,) permanent, the leaves ovate, pointed, flat, hirsute; the hairs glandular at the extremities. The hermaphrodite flowers may be distinguished by the four stamina, which on the shedding of the pollen fly back with elastic force. The female is known by its situation between the two others, and by its want of stamina; the stigma is somewhat larger, and bent a little down. To obtain a perfect idea of the manner in which the fructification is carried on in this plant, the flowers should be examined at a very early period of their expansion; we shall then find in each involucre three red stigmas, the two outermost of which belong to hermaphrodite flowers, the stamina of which are not yet visible; the middle one, which is largest and most conspicuous, to the female. If a view be taken of the same flowers, at the time that the elastic filamenta by their sudden expansion are scattering the pollen, the styles and stigmas of the hermaphrodite flowers, visible before, will often be found wanting, and the germen left naked in the centre of the flower; at this period the segments of the calix in the same flowers are nearly of the same length as the filamenta, the style and stigma of the female flower remain perfect, and the germen is closely surrounded by a green hairy calix, which never expands. The manner in which the flowers shed their pollen is curious: the filamenta, on their first appearance, all bend inwards; as soon as the pollen is arrived at a proper state to be discharged, the warmth of the sun, or the least touch from the point of a pin, will make them instantly fly back, and discharge a little cloud of dust. This process is best seen in a morning, when the sun shines on the plant, in July or August: if the plant be large, numbers will be seen exploding at the same instant.—This plant promises little from its sensible qualities; it has no smell, and its taste is simply herbaceous. Formerly it was accounted emollient, but not mucilaginous; its character as a diuretic is better known. Matthiolus tells us, that the expressed juice, sweetened with sugar, had a very powerful effect in this way; and Barbeirac informs us, that a decoction of this plant was found of great use in clearing the urinary passages of viscid mucus, and sabulous concretions. A gentleman, who converts the juice into a thin syrup, and gives two table-spoonfuls thrice a day, has observed remarkably good effects from it, in those dropsical cases where other diuretics had failed; and Tournefort, in his history of the plants about Paris, says that the syrup gives great relief in hydropic cases. Hill says, a strong infusion of the plant works powerfully by urine, and is excellent for the gravel and the yellow jaundice. The leaves are useful in poultices, to take away hot swellings; and the expressed juice has been given with advantage in the stone and gravel, and is said to be an excellent medicine in breakings-out arising from foulness of the blood and juices: but the use of it must in these cases be continued for a considerable time, or little if any benefit can be expected. Dr. Stokes says, he has been informed that this herb, as well as Nitraria, contains a considerable quantity of nitre; and that in making an extract from it, the mass had taken fire. It is recommended by Bradley, to be laid on corn in granaries, for the purpose of driving away the weevil. Parietaria, corrupted into Pellitory, is absurdly called Pellitory of the Wall, being found on walls or among rubbish.—It is a native of most parts of Europe, except the most northerly; and though not found in Sweden, may be met with in Denmark.

3. Parietaria Judaica; *Basil-leaved Pellitory.* Leaves ovate; stems erect; calices three-flowered; corollas male, elongated, cylindrical. This differs from the preceding in having shorter stalks, and smaller oval leaves; the flowers are also less, and in smaller clusters.—Native of Switzerland, the south of France, Sicily, Germany, and Palestine.

4. Parietaria Lusitanica; *Chickweed-leaved Pellitory.* Leaves ovate, obtuse; stems filiform, striated, even, procumbent.—Native of Spain and Portugal.

5. Parietaria Urticæfolia; *Nettle-leaved Pellitory.* Leaves ovate, opposite, petioled, serrate, veined, pubescent; flowers axillary. This is a very branching plant, with small leaves, much resembling those of the Nettle.—Found in the island of Bourbon, hanging from the rocks in branched leafy tufts.

6. Parietaria Cretica; *Cretan Pellitory.* Leaves subovate; fruiting involucres five-cleft, compressed; lateral segments larger.—Native of Candia.

7. Parietaria Capensis; *Cape Pellitory.* Leaves opposite, ovate, serrate; branches diffused; flowers sessile.—Native of the Cape of Good Hope.

8. Parietaria Debilis. Leaves alternate, ovate, petioled, quite entire, somewhat hairy; peduncles axillary, subtriflorous; stem almost upright.—Native of New Zealand.

9. Parietaria Cochin-chinensis. Leaves ovate, three-nerved, hairy; stem cespitose, diffused, a foot and half high; flowers monœcous; seed roundish, inclosed within the converging calix.—Native of China and Cochin-china. It attracts the worms that infest salt fish, or flesh; the natives hang the plant at the mouth of their meat-casks, and the insects get into it of their own accord. They also esteem it to be emollient, refrigerant, and diuretic.

10. Parietaria Arborea; *Tree Pellitory.* Leaves elliptic, acuminate, somewhat triple-nerved; stem arborcous. This is an upright soft shrub, about the height of a man; root woody, branched, fibrous, rufescent; flowers commonly three, clustered, from the axil of each bracte sessile, in the male yellow, in the female red, herbaceous.—Native of the Canary Islands. It may be increased by cutting, but requires the protection of the green-house.

Paris; a genus of the class Octandria, order Tetragynia. —Generic Character. *Calix:* perianth four-leaved, permanent; leaflets lanceolate, acute, the size of the corolla, spreading. *Corolla:* petals four, spreading, awl-shaped (according to Gærtner, linear,) like the calix, permanent. *Stamina:* filamenta eight, awl-shaped, below the antheræ short; antheræ long, fastened on both sides to the middle of the

filamenta. *Pistil:* germen superior, round, four-cornered, or subglobular; styles four, spreading, shorter than the stamina; stigma downy. *Pericarp:* berry globular, four-cornered, four-celled. *Seeds:* several, globose, in a double row. ESSENTIAL CHARACTER. *Calix:* four-leaved. *Petals:* four, narrower. *Berry:* four-celled.——The only known species is,

1. Paris Quadrifolia; *Herb Paris, True Love,* or *One Berry.* Few plants are more readily distinguished than this, by the proportion and regularity of all the parts. Root perennial, fleshy; stalk quite simple, or unbranched, upright, smooth, round, naked, a foot high; leaves four, in a cross or sort of whorl, spreading, sessile, at the top of the stalk ovate, quite entire, drawn to a point, smooth, nerved underneath, three or four inches long, and two wide; peduncle single, rising from the middle of the four leaves, somewhat angular, about an inch long, supporting one greenish flower an inch in diameter; calicine leaflets four, linear-lanceolate, acute, reflex. The leaves and berries are said to partake of the properties of Opium. Linneus says, the root dried and reduced to powder will vomit as well as ipecacuanha, but must be taken in twice the quantity. The juice of the berries is useful in inflammations of the eyes. An ointment made of the leaves is cooling, and disperses swellings and tumors in any part of the body. The juice of them has the same effect, and speedily removes inflammations of the eyes, if they are frequently bathed therewith. It is, after all, a suspicious plant, although it has often been employed in medicine. Bergius recommends the herb for discussing buboes and other inflammatory tumors; also for the hooping or convulsive cough. Gesner found it to be an antidote to the poison of the Nux Vomica. Having given a scruple each, of the poison, to two dogs, he gave one a drachm of the Paris, and it recovered; the other died. He also took a drachm of the herb himself, without any effect except dryness of the fauces, and some sweat. Burghard, on the contrary, says, that cardialgia and vomiting ensues from the use of it; and Kroeber was credibly informed that a child died by eating the berries, and that another was recovered with difficulty. Gesner asserts, that the berries are poisonous to poultry. It ought therefore to be administered with great caution: the dose is one scruple twice a day.—It is a native of most of the countries of Europe, particularly in the northern parts; and also of Japan. It is not uncommon in Great Britain, especially in thick strong woods on a strong soil. Gerarde says, it grew plentifully in Chalkney woods near Wakes Colne in Essex; in the parsonage orchard at Radwinter, and in Bocking park by Braintree, in the same county; in the wood by Robin Hood's well, near Nottingham; in the Clapper Moor, near Canterbury; in Blackburn wood, at Merton in Lancashire; in Dingley wood, six miles from Preston in Aundernesse; also at Hesset, in the same county. Though Parkinson says that in his time it was lost in the above places by every one resorting thither for it, there is no small probability of his being mistaken in most instances; we therefore exhort those diligent herbarists who live in those parts to examine for themselves. Parkinson says, that it was found in his time in Hinbury wood, three miles from Maidstone in Kent; in a wood called Harwarsh, near Pinnenden Heath, by Maidstone; in Longwood, near Chiselhurst, and in the next called Iseet's wood; and in a wood over against Boxly Abbey near Maidstone. Mr. Newton found it in the long spring by Petses bogs at Chiselhurst; and Mr. Ray, in Lampit Grove at Notley in Essex. Mr. Charles Miller discovered it in a little wood not far from Hampstead, though Mr. Curtis has omitted it in his *Flora Londinensis.* It has also been met with at Hanging wood near Harefield, Middlesex; at Hawnes, Renhold, and Clapham; Park wood in Bedfordshire; in Kingston, Eversden, and Wood Ditton woods, Cambridgeshire; in Love-lane near Derby; at Selborne in Hampshire; in Ripton wood, Huntingdonshire, and Byseing wood in Kent; in Hollinghall, Stocking, and Okeley woods, in Leicestershire; in Brampton, Cransley, and Hardwick woods, and Whittleborough forest, in Northamptonshire; in Asply and Colwick woods, Nottinghamshire; in Headington-wick Copse, Oxfordshire; in the wood near the Devil's Den near Clifton upon Teine; also in the woods on the sides of Breedon Hill, and about Frankly, in Worcestershire; near Rainsford, and in Raby Park. In Scotland, in a wood a mile to the south of Newbottle near Dalkeith; in the den of Bethaick, four miles from Perth; and also in the wood of Methuen, in Perthshire.—This curious little plant flowers in May, and the berry ripens in July. It is with great difficulty preserved in gardens. Take up the plants from the places where they grow wild, preserving good balls of earth to their roots, and plant them in a shady moist border, where they may remain undisturbed.

Parkinsonia; a genus of the class Decandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, at the base bell-shaped, flattish, permanent; border five-parted; segments lanceolate-ovate, acute, coloured, reflex, almost equal, deciduous. *Corolla:* petals five, with claws almost equal, spreading very much, ovate; the lowest kidney-form; claw upright, very long. *Stamina:* filamenta ten, awl-shaped, villose below, declined; antheræ oblong, decumbent. *Pistil:* germen round, long, declined; style filiform, rising, the length of the stamina; stigma blunt. *Pericarp:* legume very long, round, swelling over the seeds, (whence it is necklace-form,) acuminate. *Seeds:* several, one to each joint of the legume, oblong, subcylindric, blunt. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Petals:* five, ovate, the lowest kidney-form. *Style:* none. *Legume:* necklace-form.——The only known species is,

1. Parkinsonia Aculeata; *Prickly Parkinsonia.* Jacquin describes it as a very elegant tree, with the bark both of the trunk and branches remaining a long time green and shining, but when the tree grows old becoming brownish and streaked. The wood is white; the prickles are solitary, awl-shaped, subaxillary, acuminate, slightly recurved, four lines in length, on the older branches frequently by threes, the middle one very strong, and nine lines in length; leaves shining, three, four, or five, from the same axil, on a midrib a foot long, broad, and flatted; leaflets oblong, numerous; racemes loose; simple, smooth, containing about ten flowers, which smell very sweet, and are yellow, with the uppermost petal variegated at the base with scarlet spots. This seems to be distinguished from *Poinciana* merely by the equality of the calicine segments: these two trees, sown very thick, make most beautiful hedges.—This plant flowers in the first year from seed, and grows very fast. It bears long slender bunches of yellow flowers, hanging down like those of Laburnum, and perfuming the air to a considerable distance, on which account the inhabitants of the West Indies plant them about their houses. In Jamaica it is called *Jerusalem Thorn.* It was introduced there from the Main, but now grows wild in many parts, and in the other islands of the West Indies, where it was originally cultivated for inclosures. It is propagated by seeds, which should be sown in small pots filled with light fresh earth, early in the spring, and the pots must be plunged into a hot-bed of tanner's bark, where, in three weeks' or a month's time, the plants will come up, when they should be kept clear from weeds, and frequently

refreshed with a little water. In a little time these plants will be fit to transplant, which should be done very carefully, so as not to injure the roots. They must be each planted into a separate halfpenny pot, filled with light fresh earth, and then plunged into the hot-bed again, observing to stir up the tan, and, if it have lost its heat, to add some fresh to renew it again. Then shade the plants from the heat of the sun, until they have taken new root, after which time they should have fresh air admitted to them every day, in proportion to the warmth of the season. With this management the plants will grow so fast as to fill the pots with their roots by the beginning of July, at which time they should be shifted into pots a little larger than the former, and plunged again into the bark-bed to forward their taking new root. The only method to keep them through the winter is to harden them to bear the open air in July and August, and in September to place them at the greatest distance from the fire, to keep them in a very temperate warmth; but they will seldom survive a second winter.

Parnassia; a genus of the class Pentandria, order Tetragynia.—Generic Character. *Calix:* perianth five-parted; segments oblong, spreading, permanent. *Corolla:* petals five, roundish, striated, concave, spreading; nectaries five, each a concave cordate scale, with from three to thirteen erect rays along the edge, gradually higher, on each of which sits a globe, (or three-parted, with equal globuliferous rays.) *Stamina:* filamenta five, awl-shaped; antheræ depressed, incumbent. *Pistil:* germen ovate, large; style none, but in its place a perforation; stigmas four, obtuse, permanent, greater in the fruit. *Pericarp:* capsule ovate, four-cornered, one-celled, four-valved. *Receptacle:* fourfold, growing to the valves. *Seeds:* very numerous, oblong. *Observe.* The essential character is most easily collected from the nectary. Essential Character. *Calix:* five-parted. *Petals:* five. *Nectaries:* five, cordate, ciliate, with globular apices. *Capsule:* four-valved.——The species are,

1. Parnassia Palustris; *Common Marsh Parnassia,* or *Grass of Parnassus.* Root perennial, small, whitish, fibrous, putting forth several stems and leaves in tufts; stems erect, unbranched, somewhat twisted, having five sharp corners, a span high, slender, smooth, bearing only a single embracing leaf below the middle, and a single flower at the top. Flowers above an inch wide, white, and singularly elegant; the petals a little scalloped at the edges, slightly emarginate, with semitransparent grayish veins.—Native of most parts of Europe, by the sides of bogs and moors, and in wet meadows. It grows near Harefield in Middlesex; about Ongar in Essex; on Hinton, Feversham, and Trumpington moors, and near Linton in Cambridgeshire; on Stevington, Turvey, and Ampthill bogs, in Bedfordshire; in peat bogs on Bullington Green, and under Headingtonwick Copse, in Oxfordshire; near Buddon wood in Leicestershire; about Rowel and Thorp in Northamptonshire; at Basford, Scottum, and Papplewick, in Nottinghamshire.—Old Gerarde notices its being found in the moor near Linton in Cambridgeshire; at Hesset in Suffolk; at a place named Drinkstone in Butcher's Mead; plentifully in Lansdall and Craven in Yorkshire, at Doncaster, and in Thornton fields, in the same county. Mr. Goodyer found it in the boggy ground below the red well of Wellingborough in Northamptonshire; and it has been observed in abundance in the castle fields of Berwick upon Tweed. Parkinson also notices its growing at Linton in Cambridgeshire; Hesset and Drinkstone in Suffolk; in the great field of Headington near Oxford; on the other side of Oxford in the pasture next to Botley, in the highway; and at the bottom of Barton hills in Bedfordshire. Merret found it with a double flower in Lancashire; and Mr. Wood about Edinburgh. It flowers in July and August.—This plant may be taken up from the natural place of growth, with balls of earth to the roots, and planted in pots filled with pretty strong, fresh, undunged earth, and placed in a shady situation, where, if they are constantly watered in dry weather, they will thrive very well, and flower every summer: but if the plants are planted in the full ground, it should be in a very moist shady border, otherwise they will not live; and these should be as duly watered as those in the pots in dry weather, to make them produce strong flowers. They may be propagated by parting their roots, which should be done in March, before they put out new leaves; but the roots should not be divided too small, for that will prevent their flowering the following summer. The roots should always be planted in a pretty strong fresh earth, for they will not thrive in a light rich soil. In the spring they must be constantly watered if the season should prove dry, otherwise they will not flower; nor should they be parted oftener than every third year, to have them strong. The seeds ripen in August.

Three other species of Parnassia have been found in North America, viz. Caroliniana, Asarifolia, and Fimbriata.

Parsley. See *Apium.*

Parsley, Macedonian. See *Bubon.*

Parsley, Mountain. See *Athamanta.*

Parsley Piert. See *Aphanes.*

Parsley, Stone. See *Athamanta.*

Parsley, Wild. See *Cardiospermum.*

Parsnep. See *Pastinaca.*

Parsnep, Cow. See *Heracleum.*

Parthenium; a genus of the class Monœcia, order Pentandria.—Generic Character. *Calix:* perianth common, quite simple, five-leaved, spreading; leaflets roundish, flat, equal. *Corolla:* compound, convex; corollet hermaphrodite, many in the disk; females five in the ray, scarcely surpassing the others: proper of the hermaphrodites one-petalled, tubular, erect, with the mouth five-cleft, the length of the calix; of the females one-petalled, tubular, ligulate, oblique, blunt, roundish, the same length with the other. *Stamina:* in the hermaphrodites; filamenta five, capillary, the length of the corollet; antheræ as many, thickish, scarcely cohering. *Pistil:* of the hermaphrodite; germen below the proper receptacle, scarcely observable; style capillary, generally shorter than the stamina; stigma none; of the female, germen inferior, turbinate-cordate, compressed, large; style filiform, the length of the corollet; stigmas two, filiform, the length of the style, spreading a little. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites abortive; in the females solitary, turbinate, cordate, compressed, naked. *Receptacle:* scarcely any, flat; chaffs separate, the florets so that each female has two hermaphrodites behind. Essential Character. *Male. Calix:* common, five-leaved. *Corolla* of the disk, one-petalled. *Female. Corolla:* of the ray five, on each side two males, with one female between, superior.——The species are,

1. Parthenium Hysterophorus; *Cut-leaved Parthenium,* or *Bastard Feverfew.* Leaves compound, multifid. This is an annual plant, growing wild in great plenty in the island of Jamaica, where it is called *Wild Wormwood.* It thrives very luxuriantly about all the settlements in the low lands, and is observed to have much the same qualities as Feverfew, being used, like that, in resolutive baths and infusions.—It flowers here in July and August, and may be propagated by sowing the seeds on a hot-bed early in the spring; and when the plants come up, they should be transplanted on

another hot-bed, at about five or six inches' distance, observing to water and shade them till they have taken new root; after which time they must have a pretty large share of fresh air in warm weather, by raising the glasses of the hot-bed every day; and they must be duly watered every other day at least. When the plants have grown so as to meet each other, they should be carefully taken up, preserving a ball of earth to their roots, and each planted into a separate pot, filled with light rich earth; and if they are plunged into a moderate hot-bed, it will greatly facilitate their taking fresh root; but where this conveniency is wanting, the plants should be removed into a warm sheltered situation, where they must be shaded from the sun until they have taken new root; after which time they may be exposed, with other hardy annual plants, in a warm situation, where they will flower in July, and ripen seed in September. But if the season should prove cold and wet, it will be proper to have a plant or two in shelter, either in the stove or under tall frames, in order to have good seeds, if those plants which are exposed should fail, so that the species may not be lost.

2. Parthenium Integrifolium; *Entire-leaved Parthenium.* Leaves ovate, crenate. This is a perennial plant, which dies in the ground every autumn, and shoots up again in the following spring. Height three feet and more, with thick, round, fleshy stems. The flowers grow in a corymb at the head of the stem and branches; the heads are snow-white above, whitish-green below, and villose at first.—Native of Virginia. It flowers in July, but seldom produces good seeds in England. It may be propagated by parting the roots in autumn, and will bear the general cold of our winters in the full ground.

Paspalum; a genus of the class Triandria, order Digynia. —Generic Character. *Calix:* glume one-flowered, two-valved, membranaceous; valves equal, orbicular, plano-concave; inner flatter, placed outwardly. *Corolla:* two-valved, the size of the calix; valves roundish, cartilaginous, outwardly convex, inflex at the base. Nectary, two membranaceous scales at the base of the germen. *Stamina:* filamenta three, capillary, the length of the glume; antheræ ovate. *Pistil:* germen roundish; styles two, capillary, the length of the flower; stigmas pencil-form, hairy, coloured. *Pericarp:* none; glumes permanent, closed, growing to the seed. *Seed:* single, roundish, compressed, convex on one side. *Observe.* The fourth species has the outer valve of the calix very short. In the sixth species the corolla is shorter than the calix. Essential Character. *Calix:* two-valved, orbicular. *Corolla:* of the same size. *Stigmas:* pencil-shaped.——The species are,

1. Paspalum Dissectum; *Cut Paspalum.* Spikes alternate, rachis membranaceous; flowers alternate, hairy at the tip. This is a prostrate annual grass, with the sheaths of the leaves almost spathaceous.—Native of North America and Japan.

2. Paspalum Scrobiculatum; *Dimpled Paspalum.* Spikes alternate; rachis membranaceous; flowers alternate; calices many-nerved, dimpled or pitted on the outside; culms erect, hirsute at the base, a foot high and more. Perennial.—Native of the East Indies, in watery places.

3. Paspalum Villosum; *Villose Paspalum.* Spikes alternate, directed one way, with an hirsute rachis; flowers in a double row, alternately directed one way; culm smooth, three feet high.—Native of Japan, near Nagasaki.

4. Paspalum Virgatum; *Rodlike Paspalum.* Spikelets panicled, alternate, villose at the base; flowers in pairs; root thickly fibrose, and perennial, throwing up several annual erect stems, of about four feet high, and thicker than a quill at the base.—Native of meadows in Jamaica.

5. Paspalum Paniculatum; *Panicled Paspalum.* Spikes panicled, verticillate, aggregate. This is an annual grass, and more erect, with the panicle as it were in whorls.—Native of moist clayey grounds in Jamaica.

6. Paspalum Stoloniferum; *Stoloniferous Paspalum.* Spikelets spiked; rachis waved; flowers alternate, directed one way; stem knee-jointed, prostrate at the base, and stoloniferous; root perennial, fibrose, whitish; culm flexuose, smooth, cylindric, two feet high, solid, rooting at the knots; branches alternate; leaves lanceolate, smooth, slightly streaked, a little waved at the edge, often three inches long, and eight lines wide. This has been successfully cultivated at Paris. The seeds have been in part abortive; but as it runs at the root, it may be easily increased. The height and abundance of its stems, the size of its leaves, and the succulence of all its parts, render it a proper grass for cultivation.—Native of Peru, where it is called *Alzaillo.*

7. Paspalum Repens; *Creeping Paspalum.* Spikes panicled, subverticillate, nodding; culm creeping. This is very like the preceding, differing only in its creeping culm, rooting at the joints, narrower leaves, and a more slender panicle. Perennial.—Native of Surinam.

8. Paspalum Hirsutum; *Shaggy Paspalum.* Spikes alternate, subbinate; rachis membranaceous; calices many-nerved, even; leaves and pedicels hirsute; culms erect, leafy, hairy above.—Native of China.

9. Paspalum Kora; *Smooth Paspalum.* Spikes alternate, subbinate; rachis membranaceous; calices roundish, five-nerved; culm and leaves smooth.—Native of the East Indies, and of the Society Isles.

10. Paspalum Longiflorum; *Long-flowered Paspalum.* Spikes two, sessile, upright; florets oval, oblong; culm ascending, branched; culms filiform, slender; flowers alternate, pedicelled, pressed close. It varies sometimes with three spikes together.—Native of Malabar, on the borders of fields.

11. Paspalum Distichum; *Two-spiked Paspalum.* Spikes two, almost erect, one of them sessile; florets oblong, smooth; culm ascending, simple, decumbent towards the root. It is a biennial grass, flowering in July.—Native of moist meadows in Jamaica and other West India Islands.

12. Paspalum Conjugatum; *Conjugate-spiked Paspalum.* Spikes two, horizontal, conjugate; spikelets ovate; culm erect; leaves involute; height from one to two feet; culm simple, compressed a little, smooth.—It is common in the moist meadows of the West Indies, where the English call it *Sourgrass;* and cattle refuse it.

13. Paspalum Vaginatum; *Sheathed Paspalum.* Spikes two; spikelets bifarious, acuminate; culm branched, knee-jointed; joints sheathed. This is a foot high; roots numerous, filiform.—Native of Jamaica, in clayey pastures.

14. Paspalum Filiforme; *Filiform Paspalum.* Spike subsolitary, linear, one-ranked; spikelets ovate, compressed; culm and leaves filiform. This is a tufted grass, two feet high.—Native of the West Indies, in open hard fields.

15. Paspalum Decumbens; *Prostrate Paspalum.* Spike single, directed one way; peduncles very long; spikelets alternate, orbiculate-acuminate, smooth; culm procumbent. It is scarcely a foot high.—Native of Jamaica, in a dry sandy soil, upon the mountains on the western side of the island.

16. Paspalum Debile. Spike for the most part single, slender; glumes contiguously alternate, solitary, pubescent, short-obovate; leaves rough; culm feeble, setaceous.—Grows on the sea-shores of Carolina and Georgia.

17. Paspalum Ciliatum. Spikes alternate, as if two together; glumes subtriseriate, double, orbiculate-obovate, obtuse,

glabrous; leaves lanceolate-linear, serrulate-ciliate: culm decumbent.—Grows in Virginia and Carolina, in those clay-soils where iron-ore abounds.

18. Paspalum Lævе. Spikes many, alternate; glumes biseriate, suborbiculate-ovate, glabrous; leaves glabrous; ligules ciliate; sheaths compressed; stalk suberect.—Grows in dry meadows and grassy hills from Pennsylvania to Carolina. This plant is named Paspalum Lentiferum in the *Encyclopedie Méthodique, Botanique*, par M. le Chevalier de Lamarck; and Paspalum Membranaceum, in Walton's *Flora Caroliniana*.

Pasque Flower. See *Anemone*.

Passerina; a genus of the class Octandria, Order Monogynia.—Generic Character. *Calix:* perianth of one leaf, shrivelling; tube cylindrical, slender, ventricose below the middle; border four-cleft, spreading; segments concave, ovate, blunt. *Corolla:* none. *Stamina:* filamenta eight, bristle-shaped, the length of the border, placed upon the point of the tube; antheræ subovate, erect. *Pistil:* germen ovate, within the tube of the corolla; style filiform, springing from the side of the very point of the germen, the same length with the tube of the corolla; stigma capitate, hispid all over with villose hairs. *Pericarp:* coriaceous, ovate, one-celled. *Seed:* single, ovate, acuminate at both ends, with the points oblique. *Observe.* The fourth species has flowers without a tube, and sixteen stamina, the eight inner ones castrated. The sixth has eight stamina, besides the rudimenta of eight antheræ at the bottom of the flower. Essential Character. *Calix:* four-cleft. *Corolla:* none. *Stamina:* placed on the tube. *Seed:* one, corticate.—The first thirteen species are diandrous, have the smell of Syringa flowers, and are evergreen. They are not separated from their natural genus, though the number of the stamina be less. The *Struthiolæ* might have been referred to this genus, had it not been for the nectaries. *Daphne* also agrees with *Passerina*.——The species are,

1. Passerina Filiformis; *Filiform Sparrow-wort.* Leaves linear, convex, imbricate in four rows, (three-cornered, acute;) branches tomentose; flowers racemed. This rises with a shrubby stalk, five or six feet high, sending out branches the whole length, which when young grow erect, but as they advance in length they incline towards a horizontal position. The flowers come out at the extremity of the young branches, from between the leaves on every side; they are small and white, so that they make no great appearance. It flowers from June to August.—Native of the Cape of Good Hope. This, with all the other Cape plants, may be increased by cuttings during the summer months, planted in a bed of loamy earth, or closely covered with a bell or hand glass to exclude the air, shading them from the sun, and refreshing them now and then with water. They will take root in about two months, when they may be planted each in a small pot filled with loamy earth, placing them in the shade to take new root; then remove them into a sheltered situation, there to remain till October, when they must be placed in the green-house, and treated as Myrtle. Those also which produce seeds, or when seeds can be procured, may also be propagated that way. Sow them in autumn soon after they are ripe, in small pots filled with light earth, plunged into an old bark-bed, under a common frame in winter. The plants will come up in the spring, and may be treated like the cuttings; but the seedling plants will grow more erect, and make a handsomer appearance.

2. Passerina Hirsuta; *Shaggy Sparrow-wort.* Leaves fleshy, smooth on the outside; stems tomentose. This has shrubby stalks, which rise to a greater height than the former; the branches are more diffused, and covered with a mealy down; flowers small and white like those of the former, and appearing about the same time.—Native of Spain and Portugal, Provence, Italy, and the Levant, in heathy places. It will live abroad in common winters, in a dry soil and warm situation, but in hard frosts the plants are frequently destroyed; one or two ought therefore to be kept in pots, and sheltered during the winter.

3. Passerina Ericoides; *Heath-like Sparrow-wort.* Leaves linear, even, subimbricate; corollas globular. This has so entirely the appearance of an *Erica*, that at first sight no one would doubt of its being one. It has the stature of the first species; which see.—Native of the Cape.

4. Passerina Capitata; *Headed Sparrow-wort.* Leaves linear, smooth; heads peduncled, tomentose, terminating, globular; peduncles tomentose, thickened; flowers many, white, sessile, without a tube; stamina above the throat, sixteen, the eight inner of which are castrated; stems shrubby, compound, with rod-like red branches.—Native of the Cape.

5. Passerina Ciliata; *Ciliated Sparrow-wort.* Leaves lanceolate, ciliate; branches naked; flowers subsolitary; stalk shrubby, rising five or six feet high, sending out many branches, which are naked to their ends, where they have oblong leaves standing erect, and having hairy points. The flowers are small, white, and come out among the leaves at the end of the branches. It flowers here in June, but no seeds are produced.—Native of the Cape.

6. Passerina Uniflora; *One-flowered Sparrow-wort.* Leaves linear, opposite, (lanceolate, even;) flowers terminating, solitary; branches smooth; stalk shrubby, seldom rising more than a foot high, dividing into many branches, which are slender, smooth, and spread out on every side. The flowers are larger than those of the former, and the upper part of the petals is spread open flat; they are of a purple colour, and appear about the same time as the former. —Native of the Cape.

7. Passerina Anthylloides. Leaves oblong, villose; flowers in heads, terminal, externally bristly. A handsome species.—Native of the Cape.

8. Passerina Spicata; *Spiked Sparrow-wort.* Leaves ovate, villose; flowers lateral, solitary. The flowering branches resemble a leafy spike.—Native of the Cape.

9. Passerina Laxa; *Loose-branched Sparrow-wort.* Leaves ovate, hairy; flowers in terminal leafy heads; branches loose. —Native of the Cape.

10. Passerina Grandiflora; *Great-flowered Sparrow-wort.* Very smooth: leaves oblong, acute, concave, wrinkled on the outside; flowers terminating, sessile, solitary; branches one-flowered. It is easily distinguished by the large borders of the flowers, silky on the outside.—Native of Africa. See the first species.

11. Passerina Gnidia. Two-stamined, very smooth: leaves lanceolate, acute.—Native of New Zealand, in the fissures of rocks on the sea-coast, and on mountain-tops.

12. Passerina Pilosa; *Hairy Sparrow-wort.* Two-stamined, hairy: leaves linear, blunt.—Native of New Zealand.

13. Passerina Prostrata; *Prostrate Sparrow-wort.* Two-stamined, hairy: leaves ovate.—Native of the dry mountains in New Zealand.

14. Passerina Cephalophora; *Great-headed Sparrow-wort.* Leaves three-cornered, in four rows; heads woolly.—Native of the Cape.

15. Passerina Linoides; *Flax-like Sparrow-wort.* Leaves linear-lanceolate, smooth, three-ribbed; flowers terminating, solitary. A hardy green-house plant, flowering in May and June, and easily increased by cuttings.—Native of the Cape.

16. Passerina Nervosa. Leaves lanceolate, smooth, three-ribbed; flowers in heads.—Native of the Cape.

17. Passerina Setosa. Leaves lanceolate, smooth, five-nerved; flowers in heads, bristly on the outside.—Native of the Cape.

18. Passerina Stricta. Leaves ovate, hirsute; flowers in heads; branches rigid.—Native of the Cape.

19. Passerina Pentandra. Leaves ovate, hirsute; spike ovate, terminating.—Native of the Cape.

Passiflora; (altered by Linneus from the old name *Flos Passionis*, or *Passion Flower*, which was given at its first discovery, from a fancy that all the instruments of our Saviour's passion were exhibited in this flower: the five stamens were compared to his five wounds; the styles to the nails by which he was fixed to the cross; the column which elevates the germen, to the cross itself, or the pillar to which he was bound; and the rays of the nectary, to his crown of thorns.) It is placed by Linneus in the class Gynandria, order Pentandria; by Schrœber and Thunberg, in the class Pentandria, order Trigynia; and by Swartz, in the class Monadelphia, order Pentandria. This beautiful genus is composed of climbing herbaceous plants, sometimes woody, especially at bottom; leaves alternate, stipulaceous, simple, in a few undivided, in a few others multifid or palmate, but in the greater part lobed; lobes in some two, but in more three. The petiole in some species is naked, in others glandular on each side. The tendrils or claspers, by which the slender weak stems sustain themselves, are axillary. The peduncles are also axillary, from one to three together, each sustaining a single flower, except in Passiflora Holosericea, in which they are many-flowered; below the calix they are commonly jointed, and have an involucre at the joint, which is frequently three-leaved or three-parted, the divisions entire, or sometimes, but rarely, cut or jagged; sometimes, however, this involucre is very small, or consists only of one leaf, or is entirely wanting. The crown, which Linneus calls the *nectarium*, constitutes great part of the beauty of the flower in many of the species. In these it consists of an inner crown, springing from the base of the petals, or inner calicine segments, and beneath them coloured, many-parted, consisting of numerous filiform segments, radiating or erect; within this is another double crown, of the same shape, but shorter and more flatted, inserted into the pitcher; the inmost frequently converges round the central column. Mr. Sowerby, who has bestowed much attention on this genus, remarks, that the larger species, as far as he has seen, have constantly two rows of principal radiated nectaries; the smaller commonly but one, and but half the number of divisions in the corolla, namely, only five; whereas the others have from ten to twelve: that the repository for honey also differs much in different species, and is a part very distinct from the crown, which perhaps may serve as a conductor, or help to screen or secure the nectareous juice: and lastly, that there is another sort, which serves as an operculum under various forms, sometimes plaited, or plaited and fringed, besides a kind of imperfect rays in different situations and shapes.—The species are,

* *With undivided Leaves.*

1. Passiflora Serratifolia; *Notch-leaved Passion Flower.* Leaves ovate, serrate; stems round, the younger ones very slightly villose, and climbing very high; the stipules are linear and acuminate; peduncles one-flowered and solitary; the calix is outwardly green, inwardly whitish; the petals pale purple; the filamenta of the nectary are deep purple at the base, from thence bluish, and at length pale; the antheræ are yellow; the stigmas greenish. The flowers have an extremely agreeable odour. It is perennial, flowers from May to October, and is a native of the West Indies.—This, and all the perennial sorts which are natives of the hot parts of America, require a stove to preserve them here, without which they will not thrive; for although some of the sorts will live in the open air during the warm months of summer, yet they make but little progress; nor will the plants produce many flowers, unless the pots in which they are planted be plunged into the tan-bed of the stove, and their branches are trained against an espalier. The best way to have them in perfection is to make a border of earth at the back of the tan-bed, which may be separated by planks, to prevent the earth from mixing with the tan; and when the plants are strong enough, they should be turned out of the pots, and planted on this border; adjoining to which should be a trellis erected at the top of the stove, and their leaves continuing green all the year, together with the flowers, which will be plentifully intermixed in summer, will have a very agreeable effect. As there will be only a plank partition between the earth and the tan, the earth will be kept warm by the tan-bed, which will be of great service to the roots of the plants. The border should not be less than two feet broad and three deep, which is the usual depth of the pit for tan; so that where these borders are intended, the pits should not be less than eight feet and a half, or nine feet and a half, broad, that the bark-bed, exclusive of the border, may be six and a half or seven feet wide. If the border be fenced off with strong ship planks, they will last some years, especially if they are painted over with a composition of melted pitch, brick-dust, and oil, which will preserve them sound a long time; and the earth should be taken out carefully from between the roots of the plants, at least once a year, putting in fresh. They are propagated by seeds, which should be sown upon a good hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a small pot, filled with good kitchen-garden earth, and plunged into a bed of tanner's bark, observing to shade them from the sun until they have taken new root; then they must be treated like other tender plants from the same countries. When they are too high to remain under the glasses of the hot-bed, they should be turned out of the pots and planted in the stove, in the manner before mentioned. As they do not perfect their seeds here, they may be propagated by laying down their branches; which if done in April, they will put out roots by the middle of August, when they may be separated from the old plants, and either planted in pots to get strength, or into the border of the stove where they are to remain. Some of them may be propagated by cuttings; these should be planted into pots about the middle or latter end of March, and plunged into a moderate hot-bed, observing to screen them from the sun, and refresh them with water gently, as often as the earth may require it; and in about two months or ten weeks they will put out roots, and may then be treated as the seedling plants.

2. Passiflora Pallida; *Pale Passion Flower.* Leaves ovate, quite entire; petioles biglandular; stem perennial, long, round, branching, climbing, solitary tendrils; flowers pale, large, axillary, two together; corolla five-petalled, flat, with a crown.—Native of Brasil, the island of Dominica, and Cochin-china. See the preceding species.

3. Passiflora Cuprea; *Copper-coloured Passion Flower.* Leaves ovate, commonly quite entire; petioles equal. This has slender three-cornered stalks, which send out tendrils at each joint, fastening themselves to any neighbouring support by them, and climbing to the height of twelve or fourteen

feet; flowers axillary, on slender peduncles an inch long; fruit oval, about the size of a sparrow's egg, changing to a purple colour when ripe, and filled with oblong seeds inclosed in a soft pulp.—Native of the Bahama islands. See the first species.

4. Passiflora Tiliæfolia; *Lime-leaved Passion Flower.* Leaves cordate, quite entire; petioles equal. Root perennial; stem climbing, about the thickness of a finger; flowers red; fruit globose, and variegated with red and yellow, having a sweet pulp.—Native of South America, near Lima. See the first species.

5. Passiflora Maliformis; *Apple-fruited Passion Flower.* Leaves cordate, oblong, quite entire; petioles biglandular; involucres quite entire. Stem thick, triangular, by slender tendrils thrown out at every joint rising to the height of fifteen or twenty feet. The cover of the flowers is composed of three soft velvety leaves of a pale red, with some stripes of a lively red colour; the petals are white, and the rays blue. The flowers being large, make a fine appearance, but they are of short duration; there is however a succession of them for some time.—It grows naturally in the West Indies, where the inhabitants call it *Granadilla;* and the fruit is served up in desserts. See the first species.

6. Passiflora Quadrangularis; *Square-stalked Passion Flower.* Leaves oval, subcordate, smooth, many-nerved; petioles glandular. Stem membranaceous, four-cornered; stipules oval, oblong; flowers very large, encompassed by a three-leaved involucre, the leaves of which are roundish, concave, entire, smooth, and pale. Mr. Miller observes, that it has much the appearance of the preceding, both in stalk and leaves; but the stalk has four angles, the leaves also of that are not hollowed at the base; the flower is much larger, though very like the other in colour; the fruit is nearly twice as large, and of a very agreeable flavour. Jacquin remarks, that the flowers are very sweet, as well as beautiful, resembling the eighth species in colour and structure, but a little larger; that the fruit is shaped like an egg, shining, greenish-yellow, larger than a goose's egg, having a soft spongy rind, a finger in thickness, brittle, whitish, insipid; the pulp succulent, of a waterish colour, and sweetish smell, and a very pleasant taste, sweet and gently acid, contained in a membrane or bag, which may be easily separated from the rind. Mr. Sowerby distinguishes this from the next species, with which it has been confounded. They are very much alike as to appearance before they flower, excepting that the leaves in this have generally twice as many side veins. The flowering even at a distance will distinguish them pretty easily, this being rather compressed, and never oblong, as that of the seventh always is, while the sixth is also destitute of awns; and the glands on the petioles are said to be six, but they are not constant, and there are likewise six sometimes in the other. The peduncle affords a most certain distinction. Jacquin has a variety, which he names *Passiflora Sulcata:* it perfectly resembles this species, except in the size and form of the fruit, which is roundish, frequently larger than a child's head, and marked with a circular transverse groove, deep enough to lay a finger in. It is a native of Terra Firma.—The fruit of Quadrangularis is brought to table whole, and is much esteemed; and the pulp, taken out of the rind, with or without the seeds, is first put into wine. The French call it *Granadille;* and Browne, the *Granadilla Vine.* —Native of the woods of Jamaica, and of other West India islands. Jacquin however says, he did not find it wild any where, but in gardens every where; to the ornament of which it very much contributes, by forming large and very close arbours in a few months. It is attended however with this inconvenience, that these arbours serve to shelter venomous serpents, which lurk there to seize on little animals that come for the fruit, of which they are very fond. See the first species.

7. Passiflora Alata; *Wing-stalked Passion Flower.* Leaves ovate, subcordate, even, few-nerved; petioles glandular; stem membranaceous, four-cornered; stipules lanceolate, serrate. This very much resembles the preceding at first sight; the open flower also presents a general resemblance, but the peduncle is cylindrical; the three divisions of the involucre small, lanceolate, with glandular serratures; the pedicel thickest at the insertion into the convex base of the flower. If this species does not equal the Common Passion Flower in elegance, it exceeds it in magnificence, in brilliancy of colours, and in fragrance, the flowers being highly odoriferous.—Native of the West Indies. See the first species.

8. Passiflora Laurifolia; *Laurel-leaved Passion Flower,* or *Water Lemon.* Leaves ovate, quite entire; petioles biglandular; involucres toothed. Stem suffrutescent, with very divaricating filiform branches. Jacquin describes it as a woody plant, smooth all over; the younger branches round and green; peduncles solitary; flowers very handsome and odoriferous; petals rose-coloured within, pale without; crown elegantly variegated transversely with white, purple, and violet; fruit three inches long, with a coriaceous, yellow, soft, rough rind, containing a watery, sweet, tasteful juice, having a peculiarly fine smell. In the West Indies they suck this pleasant juice through a hole in the fruit. The French call it, *Pommes de Hiane;* and the English, *Honeysuckle!* Browne says, it is cultivated in many parts of America for the sake of its fruit, which is very delicate, and much esteemed by most palates; it is about the size of a hen's egg, and full of a very agreeable gelatinous pulp. It flowers in June and July. See the first species.

9. Passiflora Multiflora; *Many-flowered Passion Flower.* Leaves oblong, quite entire; flowers in clusters. Stalks slender, sending out many small branches, and climbing to the height of twenty-five or thirty feet; by age they become woody towards the bottom, and their joints are not far asunder; flowers axillary, on long peduncles; petals oblong, white; rays blueish-purple, inclining to red at bottom. The flowers have an agreeable odour, but seldom continue twenty hours open; there is a succession of them from June to September, and sometimes the fruit will ripen here.—Native of Vera Cruz. See the first species.

10. Passiflora Angustifolia; *Narrow-leaved Passion Flower.* Leaves subcordate, lanceolate, entire; petioles biglandular; flowers solitary.—Native of Jamaica.

11. Passiflora Adulterina. Leaves oblong, oval, entire; flowers tubular; calices three-leaved; stem angular, lanuginose all over; flowers solitary, peduncled, pendulous, purple. —Native of New Granada. See the first species.

** *With two-lobed Leaves.*

12. Passiflora Perfoliata; *Perfoliate Passion Flower.* Leaves oblong, transverse, embracing, petioled, dotted underneath; crown simple, many-parted. Stem herbaceous, climbing and twining, three-cornered, subdivided, striated, pubescent; flowers middle-sized, scarlet.—Native of Jamaica, in dry hedges near the coast, on the southern side of the island, flowering in the middle of summer. See the first species.

13. Passiflora Rubra; *Red-fruited Passion Flower.* Leaves cordate; lobes acuminate, subtomentose underneath. Stem villose; flowers alternate, nodding, on solitary one-flowered peduncles; petals whitish, or pale flesh colour. It flowers in April and May.—Native of the West Indies. See the first species.

14. Passiflora Normalis. Leaves emarginate at the base; lobes linear, blunt, divaricate, the middle ones obsolete, mucronate. This has slender angular stalks, which rise twenty feet high, sending out many branches; the flowers and tendrils come out from the same joints: the former are of a pale colour, and small; fruit egg-shaped, ovate, purple, the size of small grapes. The root of this plant is much extolled by Hernandes, as a counter-poison and diuretic, for easing pain and creating appetite.—Native of South America. See the first species.

15. Passiflora Murucuja; *Tubular-crowned Passion Flower.* Leaves ovate, undivided at the base, dotted underneath; nectary one-leafed; stem herbaceous, grooved, smooth; flowers in pairs, axillary, scarlet, large. The fruit, according to Browne, is of an oblong oval form, about the size of a large Olive, and flesh-coloured when ripe. Both the syrup and decoction of the plant, is much used in the leeward parts of Jamaica, where it is frequent; and it is said to answer effectually all the purposes for which syrup of poppies, and liquid laudanum, are generally administered. The flowers are most in use: they are commonly infused in, or pounded and mixed immediately with, wine or spirits; and the composition is generally thought a very easy and effectual narcotic. Browne calls it *Bull-hoof*, or Dutchman's Laudanum, which are probably the vulgar name of the country.—Native of the West Indies. See the first species.

16. Passiflora Vespertilio; *Bat-winged Passion Flower.* Leaves rounded at the base, and glandular; lobes acute, divaricate, dotted underneath. This has slender, striated, roundish stalks, less than a straw, and of the same thickness from top to bottom, of a brownish-red colour, dividing into many branches; flowers on short round peduncles, from the axils of the middle and upper leaves, white, and of a middle size, about three inches in diameter when expanded. They are scentless, opening in the evening or during the night, in the month of July, and finally close about eight or nine o'clock in the morning.—Native of the West Indies, and near Carthagena in New Spain. See the first species.

17. Passiflora Lunata; *Crescent-leaved Passion Flower.* Leaves dotted at the base, slightly cordate, and having two glands; outer rays of the nectary club-shaped, compressed, obtuse. Stems several, above thirty feet high in a cultivated state, roundish and woody at the base: in the upper part acutely angular, striated, almost herbaceous, nearly smooth, alternately branched; flowers axillary, two together, drooping, opening early in the day, and smelling like honey; petals white; peduncles twice as long as the petioles, round, swelling at the top, slightly downy, each bearing a single flower.—Native of Vera Cruz. See the first species.

18. Passiflora Capsularis. Leaves cordate, oblong, petioled. Stalks slender, rising to twenty feet high when supported, and divided into many weak branches; peduncles very slender, an inch and half long, purplish; flowers when expanded not more than an inch and half in diameter, of a soft red colour, with little scent; fruit small, oval when ripe, purple.—Native of Jamaica. See the first species.

**** With three-lobed Leaves.*

19. Passiflora Rotundifolia; *Round-leaved Passion Flower.* Leaves roundish, three-lobed only at top, dotted underneath; nectary simple. Stem suffrutescent at bottom, subdivided, angular, grooved; flowers nodding, pale green, rather large. Jacquin observes, that the glandular dots on the under side of the leaf are six or seven in a longitudinal row, along the inner side of the two lateral nerves; that the stipules are acuminate, shining, embracing, and resembling bull's horns; that the peduncles are the same length with the leaves; that the flowers are middle-sized, and void of scent; that there is a three-leaved involucre; the leaflets ovate, concave, small, firm, shining, smooth, yellowish, with a tinge of green; that the petals are white, and twice as long as the calix; the nectary multifid and yellow; that the berry is roundish, small, and juiceless; and that in most of the leaves the middle lobe is scarcely to be observed. He says it is very common in the woods about Carthagena in New Spain; while Swartz found it in the coppices on the southern side of Jamaica. See the first species.

20. Passiflora Oblongata. Leaves elliptic, subtrilobate in front, dotted underneath; lobes sharpish, the middle one shorter.—Native of the island of Jamaica.

21. Passiflora Punctata; *Dotted-leaved Passion Flower.* Leaves oblong, dotted underneath, the middle one smaller; flowers solitary, with a flattish expanded calix, whitish, ovate petals, and violet rays tipped with bright yellow.—Native of Peru.

22. Passiflora Lutea; *Yellow Passion Flower.* Leaves cordate, smooth; lobes ovate; petioles without glands. Root creeping, sending up many weak stalks three or four feet high; peduncle slender, an inch and half long; flowers greenish-yellow, not larger than a sixpence when expanded. It flowers from June to August.—Native of Virginia and Jamaica. This may be propagated by its creeping roots, parted in April, and planted where they are to remain. It requires the same treatment as the 32d species.

23. Passiflora Parviflora; *Small-flowered Passion Flower.* Leaves smooth; lobes ovate, entire, the middle one more produced; petioles biglandular; stem herbaceous.—Native of Jamaica.

24. Passiflora Glauca; *Glaucous-leaved Passion Flower.* Leaves cordate, smooth; lobes ovate, equal; petioles glandular; stipules semi-ovate. The whole plant is very smooth and even; nectary shorter by half than the petals; rays violet, white at the tip; flowers sweet.—Native of Cayenne.

25. Passiflora Minima; *Dwarf Passion Flower.* Leaves deeply three-lobed, rather downy; lobes lanceolate, quite entire, the middle one more produced; petioles biglandular. Stem even, suberose at bottom; flowers small, whitish; berry small, blue, egg-shaped. Mr. Sowerby remarks, that though this has its name from its smallness, there are others nearly, if not quite, as small, and not well distinguished; that several of them have no involucre, though there is a joint on the peduncle, or, as he has it, between the peduncle and pedicel; and that they have but five petals, consequently nothing that serves as a calix. It flowers in July.—Native of Curaçao and Jamaica; flowering in our stoves in July.

26. Passiflora Heterophylla; *Narrow-leaved Passion Flower.* Leaves undivided, linear, oblong, and three-lobed, smooth, quite entire; petioles biglandular.—Native of the West Indies, and flowering from June to September.

27. Passiflora Suberosa; *Cork-barked Passion Flower.* Leaves subpeltate; lobes ovate, entire; petioles biglandular; stem with corky angles. As the stalks grow old, they have a thick fungous bark, like that of the Cork-tree, which cracks and splits. The smaller branches are covered with a smooth bark; the flowers are small, of a greenish yellow colour; fruit egg-shaped, dark purple when ripe.—Native of the West Indies, flowering from June to September.

28. Passiflora Holosericea; *Silky-leaved Passion Flower.* Leaves with a reflex toothlet on each side at the base. The stalks rise twenty feet high, dividing into many slender branches, covered with a soft hairy down; flowers not half so large as those of the Common or Blue Passion Flower; petals white; rays purple, with a mixture of yellow; fruit

small, roundish, yellow when ripe. It flowers most part of the summer.—Native of La Vera Cruz.

29. Passiflora Hirsuta; *Hairy Passion Flower.* Leaves villose, the lower smooth above; lobes oblong, quite entire, the middle one more produced; petioles biglandular. It flowers in September.—Native of the West Indies.

30. Passiflora Fœtida; *Stinking Passion Flower.* Leaves cordate, hairy; involucres capillary, multifid. Root annual, or rather biennial; the stalks rise five or six feet high when supported, they are channelled or hairy; flowers on strong hairy peduncles, two inches long, they are white, and of a short duration; calix composed of slender hairy filamenta, wrought like a net, longer than the petals, and turning up round them; fruit roundish, ovate, about the size of a Golden Pippin, of a yellowish-green colour, inclosed in the nettled calix. The whole plant has a disagreeable scent when touched.—It grows naturally in most of the islands of the British West Indies, where the inhabitants call it *Love in a Mist*, because it resembles *Nigella Damascena* in the involucre. It is propagated by seeds sown upon a hot-bed early in the spring. When the plants are fit to be removed, transplant each into a small pot filled with light kitchen-garden earth; plunge them into a hot-bed again, and shade them from the sun till they have taken new root. Shift them into larger pots as the roots increase; and when the plants are too tall to remain in the hot-bed, remove them into an airy glass-case, admitting air in warm weather, but screening them from cold. In this situation the plants will flower in July, and the seeds ripen in autumn.

31. Passiflora Ciliata; *Fringe-leaved Passion Flower.* Leaves smooth, ciliate-serrate, the middle one very long; petioles not glandular. The leaves of this species vary occasionally; they are dark-green and glossy: the involucrum is composed of three leaves divided into capillary segments, each terminating in a viscid globule; the pillar supporting the germen is bright purple, with darker spots; the petals are greenish on the outside, and red within.—Native of Jamaica.

32. Passiflora Incarnata; *Flesh-coloured Passion Flower*, or *Maycock.* Leaves deeply three-lobed, serrated, acute, three-ribbed, with two glands at the base; bractes distinct, lanceolate, with glandular teeth; calix flat; rays as long as the petals. This is one of the first species known in Europe, being cultivated in the days of Gerarde and Parkinson, though now seldom met with, as it will scarcely ever survive the English winter, or rather spring. The leaves are finely downy on both sides, paler beneath; flowers rather large, flesh-coloured, or pale purple, the long slender rays elegantly speckled with crimson and white.—Native of North America. It is usually propagated in England by seeds, which are brought from North America, for the seeds do not often ripen in England, though they have been known to ripen perfectly on plants which were plunged in a tan-bed, under a deep frame; but those plants which are exposed to the open air, do not produce fruit here. The seeds should be sown upon a moderate hot-bed, which will bring up the plants much sooner than when they are sown in the open air, so that they will have more time to acquire strength before winter. When the plants are come up two or three inches high, they should be carefully taken up, and each planted in a separate small pot filled with good kitchen-garden earth, and plunged into a moderate hot-bed, to forward their taking root: after which they should be gradually inured to bear the open air, to which they should be exposed in summer, but in the autumn they must be placed under a garden-frame to screen them from the frost; but they should have the free air at all times in mild weather. The spring following, some of these plants may be turned out of the pots, and planted in a warm border, where, if they be covered with tanner's bark every winter to keep out the frost, they will live several years, their stalks decaying in the autumn, and new ones arising in the spring, which in warm seasons will flower very well. If those plants which are continued in pots are plunged into a tan-bed, some of them may produce fruit; and if the stalks of these are laid down in the beginning of June, into pots of earth plunged near them, they will take root by the end of August.

33. Passiflora Aurantia; *Orange Passion Flower.* Leaves three-lobed; lobes parabolical, distant, the middle one more produced. Flowers orange; the tube of the nectary green, longer than the purple upright rays which surround it.—Native of New Caledonia.

34. Passiflora Mixta. Leaves trifid, serrate; flowers tubular; calices one-leafed. Stem angular, smooth; flowers solitary, peduncled, nodding, red, on round pubescent peduncles.—Native of New Granada.

**** *With multifid Leaves.*

35. Passiflora Cœrulea; *Common* or *Blue Passion Flower.* Leaves deeply palmate, in five entire smooth segments. This, in a few years, with proper support, rises to a great height; it may be trained to upwards of forty feet. The stalks will grow almost as large as a man's arm, and are covered with a purplish bark, but do not become very woody. The shoots often grow to the length of twelve or fifteen feet in one summer, and being very slender, must be supported, otherwise they will hang to the ground, intermix with each other, and appear very unsightly. The flowers have a faint scent, and continue but one day; fruit egg-shaped, the size and form of the Mogul Plum, and when ripe of the same yellow colour, inclosing a sweetish disagreeable pulp, in which oblong seeds are lodged. There is a variety with much narrower lobes, divided almost to the bottom; the flowers come later in the summer; the petals are narrower, and of a purer white.—The Blue Passion Flower grows naturally in Brazil; and, being hardy enough to thrive in the open air, is now become the most common species in England. It may be propagated by seeds, which should be sown in the same manner as those of the thirty-second sort, and the plants treated in the same way till the following spring, when they should be turned out of the pots, and planted against a good-aspected wall, where they may have height for their shoots to extend, otherwise they will hang about and entangle each other, so as to make but an indifferent appearance; but where buildings are to be covered, this plant is very proper for the purpose. After they have taken good root in their new quarters, the only care they will require is to train their shoots up against the wall, as they extend in length, to prevent their hanging about; and if the winter prove severe, the surface of the ground about their roots should be covered with mulch, to keep the frost from penetrating the ground; and if the stalks and branches are covered with mats, pease-haulm, straw, or any such light covering, it will protect them in winter against severe frosts; but this covering must be removed in mild weather, or it will produce mouldiness in the branches, which would be more injurious than the cold. In the spring the plants should be trimmed, when all the small weak shoots should be entirely cut off, and the strong ones shortened to about four or five feet long, which will enable them to put out strong shoots for flowering the following year. This plant is also propagated by laying down the branches, which in one year will be well rooted, may be taken off from the old plants, and transplanted where they are designed to

remain. The cuttings of this will also take root, if they are planted in a loamy soil not too stiff, in the spring, before they begin to shoot. If these be covered with bell or hand glasses to exclude the air, they will succeed much better than when they are otherwise treated; but when the cuttings put out shoots, the air should be admitted to them, or they will draw up weak, and spoil, and they must be afterwards treated as the layers. Those plants which are propagated by layers, or cuttings, do not produce fruit so plentifully as the seedling plants; and this plant, as well as many others, seldom produces fruit after having been twice or thrice propagated by layers or cuttings. If in very severe winters the stalks be killed to the ground, the roots often put out new stalks the following summer, therefore they should not be disturbed, and where there is mulch laid on the ground about their roots, there will be little danger of their being killed, although all the stalks should be destroyed.

36. Passiflora Filamentosa; *Long-rayed Blue Passion Flower.* Leaves palmate, in five acute scattered segments; footstalks with two sessile glands; bractes distinct; rays longer than the corolla.—Native of America.

37. Passiflora Serrata; *Serrate-leaved Passion Flower.* Leaves palmate, serrate. Stems woody; at each knot a leaf, a tendril, and a flower, come out from the same point; peduncle two inches long. The flower is inclosed in an involucre, and both together are larger than a hen's egg. The lower half of the flower when expanded resembles a cup with a pentagon rim, white on the inside, hairy at bottom. The corolla is composed of ten violet-coloured petals in two rows, five in each, the inner much narrower than the outer, all an inch and half long, with a small point at the end, verging outwards. Fruit the size of an orange, round, polished, like that of Coloquintida, except that next the peduncle it is drawn out like a pear: it is filled with a white mucilaginous pulp, containing many seeds, a little larger than grains of wheat, oval, a little compressed, pointed at one end, hardish, shining, hairy.—Native of the island of Martinique. See the first species.

38. Passiflora Pedata; *Curl-flowered Passion Flower.* Leaves pedate, serrate. Stems angular; the flowers rather larger than those of the preceding; the rays of the crown are very close, deep red, with two or three white rings, very slender at the end, and violet; they are twisted so as to resemble the serpents about Medusa's head. The five inner parts of the corolla are entirely blue; the five outer pale green within, with abundance of little red dots; on the outside clear green; fruit the size and form of a middling apple; rind regular and smooth, of a shining green colour, with still brighter dots.—Native of the island of Dominica.

Passion Flower. See *Passiflora.*

Pastinaca; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal manifold, flat; partial manifold: involucre universal none; partial none; perianth proper, obsolete. *Corolla:* universal uniform; florets all fertile; partial of five lanceolate, involute, entire petals. *Stamina:* filamenta five, capillary; antheræ roundish. *Pistil:* germen inferior; styles two, reflex; stigmas blunt *Pericarp:* none; fruit compressed, flat, elliptic, bipartile. *Seeds:* two, elliptic, girt round the edge, almost flat on both sides. Essential Character. *Fruit:* elliptic, compressed, flat. *Petals:* involute, entire. *Involucre:* neither general nor partial.——The species are,

1. Pastinaca Lucida; *Shining-leaved Parsnep.* Root-leaves simple, cordate, lobate, shining, acutely crenate; stem-leaves ternate and pinnate; branch-leaves simple, wedge-shaped. Root biennial, thick, milky; stem stiff, rugged, grooved, and angular, branched from the bottom, almost the height of a man, when cut yielding a fetid rue-like, whitish, tenacious gum; branches numerous, panicled; flowers yellow.—Native of the south of Europe.

2. Pastinaca Sativa; *Common Parsnep,* Leaves simply pinnate, downy beneath; root biennial, simple, whitish, putting forth some large fibres from the side; stem single, three or four feet high, erect, rigid, angular, pubescent, hollow, branched; flowering branches come out from the axils of the leaves from top to bottom, supporting umbels which are smaller than that which terminates the stem; flowers small, yellow, with inflex regular petals.—Wild Parsnep is a native of most parts of Europe, on the borders of ploughed fields and on the banks of hedges, chiefly in a calcareous or marly soil. It flowers from the end of June through August. Garden Parsnep has smooth leaves, of a light or yellowish-green colour, in which it differs from the wild plant; the stalks also rise higher, and are deeper channelled; the peduncles are much longer, and the flowers of a deeper yellow colour. The wild plant is sometimes smooth, but more often hairy; and the garden plant sometimes hairy, but generally smooth. The roots are sweeter than Carrots, and are much eaten by those who abstain from animal food in Lent, or eat salt fish on fast days. They are highly nutritious, and in the north of Ireland are brewed with malt, instead of hops, and fermented with yeast. The liquor thus obtained is agreeable. Hogs are fond of these roots, upon which they soon grow fat. Allione observes, that although the old roots of the wild Parsnep be hot and acrimonious, yet we are not to attribute to them the bad effects which some affirm them to have. The seeds contain an essential oil, and will often cure intermittent fevers. The seeds, used in medicine, should be those of the wild plant; but the druggists commonly sell the seed of the garden kind for it, which they may purchase at an easy price when it is too old to grow. A strong decoction of the root is a pretty strong diuretic, and assists in removing obstructions of the viscera. It is good against the jaundice and gravel, and moderately promotes the menses. Villars remarks, that in Dauphiny there are two remarkable varieties of the Wild Parsnep: one with an angular branched stem, approaching very nearly to the Garden Parsnep; the other with a simple round stem, very slightly striated, and receding so far from the cultivated plant that it seems to be a distinct species.—The Parsnep being large and sweet, and accounted very nourishing, is universally cultivated in kitchen-gardens. The seeds should be sown in February or March, in a rich mellow soil, well dug, that their roots may run downwards, the greatest excellency being the length and size of the roots. They may be sown alone, or with Carrots, as is practised by the kitchen-gardeners near London, some of whom also mix Leeks, Onions, and Lettuce, with their Parsneps; but this is injudicious, for it is not possible that so many different sorts can thrive well together, except they are allowed a considerable distance; and if so, it will be equally the same to sow the different sorts separate. However, Carrots and Parsneps may be sown together very well, especially where the Carrots are designed to be drawn off young; because the Parsneps generally spread most towards the end of the summer, when the early Carrots are gone. When the plants are come up, hoe them out to ten or twelve inches asunder, cutting up all the weeds. This must be repeated three or four times, according as you find the weeds grow; but in the latter part of summer, when the plants cover the ground, they will prevent the growth of weeds. When the leaves begin to decay, the roots may be dug up for use. Before this, they are sel-

dom well-tasted; nor are they good for much in the spring, after they are shot out again. To preserve them for this season, dig them up in the beginning of February, and bury them in the sand in a dry place, where they will remain good until the middle of April, or later. To save seeds, make choice of some of the longest, straightest, and largest roots, and plant them two feet asunder, where they are defended from strong south and south-west winds, for the stems grow to a great height; keep them clear from weeds, and, if the season should prove dry, water them twice a week. At the end of August, or the beginning of September, the seeds will be ripe; then carefully cut the umbels, and spread them upon a coarse cloth for two or three days to dry; after which beat out the seeds, and put them up for use. Never trust to the seeds that are more than a year old, for they will seldom grow beyond that age. The leaves are dangerous to handle, especially in a morning, while the dew remains upon them. Gardeners who have been drawing up Carrots from among Parsneps while their leaves are wet with dew, with the sleeves of their shirts turned up to their shoulders, often have their arms covered with large blisters, full of scalding liquor, which have proved very troublesome for several days. To cultivate Parsneps for the farmer, sow the seed in autumn, soon after it is ripe; by which means the plants will come on early the following spring, and get strong before the weeds can grow so as to injure them. The young plants never suffer materially through the severity of the seasons. The best soil for them is a rich deep loam; next to this is a sand; or they will thrive well in a black gritty soil; but will never pay for cultivating in stone, brash, gravel, or clay soils; and they are always the largest where the staple is the deepest. If the soil be proper, they do not require much manure: a very good crop has been obtained, for three successive years, without any. Forty cart-loads of sand laid on an acre of very stiff loam, and ploughed in, has answered very well. Sow the seed in drills eighteen inches distant, that the plants may be horse or hand hoed: they will be more luxuriant if they have a second hoeing, and are carefully earthed, so as not to cover the leaves. If land cannot be got in proper condition to receive the seed in autumn, sow a plat in the garden, or the corner of a field, and transplant thence at the end of April, or early in May. The plants must be carefully drawn, and the land that is to receive them well pulverized by harrowing and rolling. When it is thus in order, open a furrow six or eight inches deep, and lay the plants in it regularly at the distance of ten inches or a foot, taking care not to let the root be bent, and that the plant stand upright after the earth is closed about it, which should be done immediately by persons following the planter with a hoe, and who must be attentive not to cover the leaves. Open another furrow eighteen inches distant from the last, plant it as before, and so proceed till the field is completely cropped. When any weeds appear, hoe the ground, and earth the plants. Dibbling, in Parsneps, is a bad method, as the ground thereby becomes so bound as not easily to admit the lateral fibres, with which the root of this plant abounds, to fix or work in the earth, on which account the roots never attain their proper size. With attention to the soil, the season for sowing, cleaning, and earthing the plants, and raising the seeds from the largest and best Parsneps, there is no doubt that the crop would answer much better than a crop of Carrots. They are equal to them, if not superior, in fatting pigs; for they make the flesh white, and the animals eat them with more satisfaction. Clean washed, and sliced among bran, horses eat them greedily, and thrive with them; nor do they heat horses, or, like corn, fill them with disorders. In France, and in our islands adjoining to it, Parsneps are held in high esteem both for cattle and swine. In Britany this crop is said to be little inferior in value to wheat. Milch cows, fed with it in winter, give as much and as good milk, and yield butter as well-flavoured, with Parsneps, as with grass in May or June.

3. Pastinaca Opoponax; *Rough Parsnep.* Leaves pinnate, and bipinnate; leaflets gashed at the base and front. Root perennial, as thick as the human arm, yellow, branched; the branches an inch or an inch and half in thickness, a foot and half in length, tubercled, with a corky bark; stem from three feet to the height of a man, the thickness of a finger, striated, covered at the base, like the Ferns, with scariose membranous scales, in other parts very smooth and shining, angular at top, especially the branches. The umbelliferous branches are very smooth. The universal umbels have usually seven or eight rays, an inch long, of a yellowish green colour; fruits flat, with the rim thicker, three or four lines in diameter, and a little longer; juice yellow, bearing no marks of a resinous or aromatic principle. It flows out where the leaf or stalks are broken. In the warmer regions of the East, of which this plant is a native, the juice concretes into a gum-resin called Opoponax. It is obtained by means of incisions made at the bottom of the stalk; and is imported from Turkey and the East Indies, sometimes in little round drops or ears, but more commonly in irregular lumps, of a reddish yellow colour, speckled with white on the outside, internally paler, and frequently variegated with large white pieces. This gum-resin has a strong disagreeable smell, and a bitter, acrid, somewhat nauseous taste. It readily forms a milky liquor with water by rubbing; and this on standing deposits a portion of resinous matter, and becomes yellowish: to rectified spirit it yields a gold-coloured tincture, which tastes and smells strongly of the drug. Water distilled from it is impregnated with its smell, but no essential oil is obtained in the operation. Opoponax has been long esteemed for its attenuating, deobstruent, and aperient virtues; but as it is commonly prescribed in combination with other medicines, these qualities are by no means ascertained, nor do its sensible qualities indicate it to be a medicine of much power. Dr. Cullen classes it with the antispasmodics; it is however less fetid than Galbanum, though more so than Ammoniacum. It has been commonly given in hypochondriacal affections, visceral obstructions, menstrual suppressions, and asthmas, especially when connected with a phlegmatic habit of body.

Pasture Ground,—is of two sorts: the one is low meadow land, which is often overflowed; and the other is upland, which lies high and dry. The former will produce a much greater quantity of hay than the latter, and will not require manuring or dressing so often; but then the hay produced on the upland is much preferable to the other, as is also the meat which is fed in the upland more valued than that which is fatted in rich meadows, though the latter will make the fatter and larger cattle, as is seen in those brought from the low rich lands in Lincolnshire. But where people are nice in their meat, they will give a much larger price for such as has been fed on the downs, or in short upland pastures, than for the other, which is much larger. Besides this, dry pastures have this superiority over the meadows, that they may be fed on all the winter, and are not so subject to poach in wet weather, nor will there be so many bad weeds produced; which are great advantages, and do in a great measure recompense for the smallness of the crop.—The first improvement of upland pasture, is by fencing it, and dividing it into small fields of four, five, six, eight, or ten acres each,

planting timber-trees in the hedge-rows, which will screen the grass from the drying pinching winds of March, which prevent the growth of the grass in large open lands; so that if April turn out a cold dry month, the land produces very little hay; whereas in the sheltered fields the grass will begin to grow early in March, and will soon after cover the ground, and prevent the sun from parching the roots of the grass, whereby it will keep growing so as to afford a tolerable crop, if the spring should prove dry. But in fencing land, it must be observed not to make the inclosure too small, especially where the hedge-rows are planted with trees; because when the trees are advanced to a considerable height, they will spread over the land; and where they are close, will render the grass sour; so that instead of being an advantage, it will greatly injure the pasture.—The next improvement of upland pasture is to make the turf good, where, either from the baldness of the soil, or want of proper care, the grass has been destroyed by rushes, bushes, or mole-hills. Where the surface of the land is clayey and cold, it may be improved by paring it off and burning it; but if it be a hot sandy land, then chalk, lime, marl, or clay, are very proper manures to lay upon it; but this should be laid on in pretty good quantities, otherwise it will be of little service to the land. If the ground be overrun with bushes or rushes, it will be of great advantage to grub them up towards the latter part of the summer, and, after they are dried, to burn them, and spread the ashes over the ground just before the autumnal rains; at which time the surface of the lands should be levelled, and sown with grass-seed, which, if done early in the autumn, will come up in a short time, and make good grass in the following spring. So also where the land is full of mole-hills, these should be pared off, and either burnt for the ashes, or spread immediately on the ground where they are pared off, observing to sow the bare patches with grass-seed just as the autumnal rains begin. There are some pasture lands which are full of ant-hills, which are not only disagreeable to the sight, but, when they are in any quantity, the grass cannot be mowed; therefore the turf which grows over them should be divided with an instrument into three parts, and pared off each way; then the middle or core of the hills should be dug out, and spread over the ground, leaving the holes green all the winter to destroy the ants, and in the spring the turf may be laid down again; and after the roots of grass are settled again in the ground, it should be rolled to settle the surface, and make it even. If this be properly managed, it will be a great improvement to such land. Where the land has been thus managed, it will be of great service to roll the turfs in the months of February and March with a heavy wood roller, always observing to do it in moist weather, that the roller may make an impression: this will render the surface level, and make it much easier to mow the grass, than when the ground lies in hills; and will also cause the turf to thicken, so as to have what the people usually term a good bottom. The grass likewise will be the sweeter for this husbandry, and it will be a great help to destroy bad weeds.—Another improvement of upland pasture, is the feeding them every other year; for where this is not practised, the land must be manured at least every third year; and where a farmer has much arable land, he will not care to part with his manure to the pasture. Therefore every farmer should endeavour to proportion his pasture to his arable land, especially where manure is scarce, otherwise he will soon find his error; for the pasture is the foundation of all the profit, which may arise from the arable land. Whenever the upland pastures are mended by manure, there should be a regard had to the nature of the soil, and a proper sort of manure applied: as, for instance, all hot sandy lands should have a cool manure; cow's dung and swine's dung are very proper for such lands, as also marl and clay; but for cold land, horse-dung, ashes, or sand, and other warm manures, are proper. And when these are applied, it should be done in autumn, before the rains have soaked the ground, and rendered it too soft to cart on; and it should be carefully spread, breaking all the clods as small as possible, and early in the spring harrowed with bushes, to let it down to the roots of the grass. When the manure is laid on at this season, the rains in winter will wash down the salts, so that the grass will derive the advantage in the following spring. There should be great care taken to destroy weeds in the pasture every spring and autumn; for where this is not practised, the weeds will ripen their seeds, which will spread over the ground, and fill it with such a crop of weeds as will soon overbear the grass, and render it very weak, if not destroy it; and it will be very difficult to root them out after they have got possession; especially Ragwort, Hawkweed, Dandelion, and such others as have down adhering to their seeds. The upland pastures seldom degenerate the grass which is sown on them, if the land be tolerably good; whereas the low meadows which are overflowed in winter, in a few years turn to a harsh rushy grass; but the upland will continue a fine and sweet grass for many years without renewing.—There is no part of husbandry of which the farmers are in general more ignorant, than that of the pasture; most of them suppose that when the old pasture is ploughed up, it can never be brought to have a good sward again; so their common method of managing their land after ploughing, and getting two or three crops of corn, is, to sow with their crop of barley some grass seeds, as they call them; that is, either the Red Clover, which they intend to stand two years after the corn is taken off the ground, or Ray-grass mixed with Trefoil; but as all these are at most but biennial plants, the roots of which decay soon after their seeds are perfected, so the ground having no crop upon it, is again ploughed for corn: and this is the constant round which the lands are employed in, by the better sort of farmers, who seldom have the least notion of laying down their land to grass for any longer continuance; therefore the seeds which they usually sow are the best adapted for this purpose. But whatever may have been the practice, it is possible to lay down land which has been in tillage with grass in such a manner as that the sward shall be as good, if not better, than any natural grass, and of as long duration. But this is never to be expected in the common method of sowing a crop of corn with the grass-seeds; for wherever this has been practised, if the corn has succeeded well, the grass has been very poor and weak; so that if the land has not been very good, the grass has scarcely been worth standing; for the following year it has produced but little hay, and the year after the crop is worth little either to mow or feed. It cannot indeed be expected to be otherwise, for the ground cannot nourish two crops; and if there were no deficiency in the land, yet the corn being the first and most vigorous of growth, will prevent the grass from making any considerable progress; so that the plants will be extremely weak and very thin, many of them which came up in the spring being destroyed by the corn; for wherever there are roots of corn, it cannot be expected there should be any grass. Therefore the grass must be thin, and if the land is not in good heart to supply the grass with nourishment, that roots may branch out after the corn is gone, there cannot be any considerable crop of Clover; and as the roots are biennial, many of the strongest plants will perish soon after they are cut,

and the weak plants, which had made but little progress before, will be the principal part of the crop for the succeeding year, which is many times not worth standing. Hence, when ground is laid down for grass, there should be no crop of any kind sown with the seeds, and the land should be well ploughed, and cleaned from weeds: otherwise, the weeds will come up at first, and grow so strong as to overbear the grass, which, if they be not pulled up, must be entirely destroyed. The best season to sow the grass-seeds upon dry land is about the middle of August, if there be an appearance of rain; for the ground being then warm, if there happen some good showers of rain after the seed is sown, the grass will soon make its appearance, and get sufficient rooting in the ground before winter; so will not be in danger of having the roots turned out of the ground by frost, especially if the ground is well rolled before the frost comes on, which will press it down, and fix the earth close to the roots. Where this has not been practised, the frost has often loosened the ground so much, as to let in the air to the roots of the grass, and done it great damage; and this has been brought as an objection to the autumnal sowing of grass; but it will be found to have no weight, if the above direction be practised: nor is there any hazard in sowing the grass at this season, but that of dry weather after the seeds are sown; for if the grass comes up well, and the ground is well rolled in the middle or end of October, and repeated in the beginning of March, the sward will be closely joined at bottom, and a good crop of hay may be expected in the same summer. In very open exposed cold lands, it is proper to sow the seeds earlier than is here mentioned, that the grass may have time to get good rooting, before the cold season comes on to stop its growth; for in such situations vegetation is over early in the autumn, so the grass being weak may be destroyed by frost; but if the seeds be sown in the beginning of August, and a few showers follow soon after to bring up the grass, it will succeed much better than any that is sown in the spring. But where the ground cannot be prepared for sowing at that season, it may be performed in the middle or latter end of March, according to the season's being early or late; for in backward springs, and in cold land, the grass has been sown in April with success: but in sowing late there is danger of dry weather, especially if the land be light and dry, so that whenever the seeds are sown late in the spring, it will be proper to roll the ground well soon after the seeds are sown, to settle the surface, and prevent its being removed by the strong winds which at that time prevail. The sorts of seeds which are the best for this purpose, are the best sort of upland hay-seeds, taken from the cleanest pastures, where there are no bad weeds; if this seed be sifted to clean it from rubbish, three, or at most four bushels, will be sufficient to sow an acre of land: the other sort is the Trifolium Pratense, eight pounds of which will be enough for one acre of land. The grass-seed should be sown first, and then the Dutch Clover-seed may be afterwards sown; but they should not be mixed together, because the Clover-seed being the heaviest, will fall to the bottom, and consequently the ground will be unequally sown with them. After the seeds are sown, the ground should be lightly harrowed, to bury them; which operation ought to be performed with a short-toothed harrow, otherwise the seeds will be buried too deep. Two or three days after sowing, if the surface of the ground be dry, it should be rolled with a barley-roller, to break the clods and smooth the ground, which will settle it, and prevent the seeds from being removed by the wind. When they are come up, if the land should produce many weeds, these should be drawn out before they grow so tall as to overbear the grass; for where this has been neglected, the weeds have taken such possession of the ground, as to keep down the grass and starve it; and when these weeds have been suffered to remain until they have shed their seeds, the land has been so plentifully stocked with them as wholly to destroy the grass; hence it is one of the principal parts of husbandry, never to suffer weeds to grow on land. If the ground be rolled up two or three times at proper distances after the grass is up, it will press it down, and cause it to make a thicker bottom; for as the Dutch Clover will put out roots from every joint of the branches which are near the ground, so by pressing down the stalks, the roots will mat so closely together, as to form a sward thick enough to cover the whole surface of the ground, and form a green carpet, which will better resist the drought. For if we examine the common pastures in summer, in most of which there are patches of the Trifolium Pratense growing naturally, we shall find these patches to be the only verdure remaining in the fields. And this, the farmers in general acknowledge, is the sweetest food for all sorts of cattle; yet never had any notion of propagating it by seeds till of late years. Nor has this been long practised in England, for till within a few years there were not any of the seeds sowed in England; though now there are many persons who save the seeds produced upon their own lands, which are found to succeed full as well as any of the foreign seeds which are imported; as this White Clover is an abiding plant, and certainly the very best sort to sow, where pastures are laid down to remain: for as the hay-seeds which are taken from the best pastures will be composed of various sorts of grass, some of which may be but annual, and others biennial; so when those go off, there will be many and large patches of ground left bare and naked, if there be not a sufficient quantity of White Clover to spread over and cover the land. Hence, a good sward can never be expected where this is not sown; for in most of the natural pastures, we find this plant makes no small share of the sward; and it is equally good for wet and dry land, growing naturally upon gravel and clay, in mort parts of England; which is a plain indication, how easily this plant may be cultivated to great advantage in most sorts of land throughout this kingdom. The true cause why the land that is in tillage is not brought to a good turf again, in the usual method of husbandry, is from the farmers not distinguishing which grasses are annual, from those which are perennial: if annual or biennial grasses be sown, they will of course soon decay; so that, unless where some of their seeds may have ripened and fallen, nothing can be expected on the land but what will naturally come up. This, together with the covetous method of laying down the ground with a crop of corn, has occasioned the general want of increasing the pasture in many parts of England, where it is now much more valuable than any arable land. After the ground has been sown in the manner before directed, and brought to a good sward, the way to preserve it good is, by constantly rolling the ground with a heavy roller, every spring and autumn, as has been before directed. This piece of husbandry is rarely practised by farmers; but those who do, find their account in it, for it is of great benefit to the grass. Another thing should also be carefully performed, which is, to cut up Docks, Dandelion, Knapweed, and all such bad weeds, by their roots, every spring and autumn; this will increase the quantity of good grass, and preserve the pastures in beauty. Dressing these pastures every third year, is also a good piece of husbandry, for without it no one can reasonably expect to obtain good crops. Besides this, it will be proper to mow one season, and feed the next; but where the ground is every year mown,

it must be constantly dressed, or the ground will be soon exhausted.—Of late years there has been an emulation, especially among gentlemen, to improve their pastures, by sowing several sorts of grass-seeds; and there have been some persons, of little skill in these matters, who have imposed on many ignorant people, by selling them seeds of some foreign grass, recommending them for some particular quality; by trying which, they have found them to be of little value, and, after losing a season or two, have had their work to begin again. On this account, it is dangerous to trust those who, upon slight experiments, have ventured to recommend without judgment; for of all the sorts of grass-seeds which have been brought from America, none have been found equal to the Common Poa Grass, either for duration or verdure. It grows naturally in England, and, with about six or seven other sorts, is the best worth cultivating, although the trouble of collecting the seeds in any quantity is so great as to deter most persons from attempting it; while those who purchase hay-seeds, find them so mixed with the seeds of weeds, that they have been compelled to adopt the plan Mr. Miller recommends, that of sowing only the White Dutch Clover seeds, and waiting for the natural grass coming up amongst it; which method has generally succeeded better than by sowing hay-seed with it; for if the pasture be duly weeded, rolled, and dressed, all bad weeds may be destroyed, and a fine durable turf obtained: whereas, the Burnet, and many other plants which have been extolled as good winter food, being of short duration, are very improper for improving land; nor are there two better plants yet known for the purpose of fodder, than the Lucern and Sainfoin; for where these are sown upon proper soils, and duly cultivated, they will produce a much greater quantity of food, than can be procured from the same quantity of land, sown with any other abiding plant. —The following are the directions of Mr. Stillingfleet, for laying down land to grass: Plough the land in March as deep as the nature of the soil will admit; harrow when the weeds are about flowering, namely, some time in May, or sooner, if it be a forward spring; plough ten days after harrowing; harrow when the weeds come up again; if any dung or compost be prepared for the land, let it be laid on; plough at this time, and plough it in a moderate depth immediately, so that the teeth of the harrow after rolling may reach it; roll the land down every day as it is ploughed with a light roller, and observe not to spread the dung long before it is ploughed in; harrow well when the weeds produced by the dung appear, so as to bring the dung up, and mix it with the soil; observing not to harrow more at once than can be ploughed in one day; plough it up after the harrows the same depth as before, and follow the plough with a roller. The land will now lie under the proper preparation for the seeds, which may be sown after the first soaking rain, from the end of August to the end of September, in the following manner. Plough the land about the same depth as before; harrow it once in a place, and sow the seeds after the harrow; then, with a hurdle bushed with black-thorn bushes, harrow the seeds in; when the plants appear, roll the land with a light roller, and not before, except the weather prove very dry, in which case it will be necessary to roll it with a very light roller after the bush-harrow; a light dressing of good manure laid on with the first frost, will be of great use in preserving the grass the first season, and encouraging its growth afterwards; and a light roller used after every frost will be of great service in the first winter. In Yorkshire, there are three modes of sowing grass-seeds: the first in August; the second and most common, with barley; and the third upon wheat in March. The first is the best, and the last the worst. They sow ten bushels to the acre, four pounds of Hop Trefoil, Black Nonesuch, *Medicago Lupulina*, or White Clover, and some persons add two pounds of Ray-grass. After the crop is cut, suffer no cattle to enter till next hay-harvest, when the grass may be either cut or fed; but there is danger from the cattle in the last way. The farmers generally mow the first crop for the sake of seeds, because that affords more than the succeeding ones. If sown with barley, roll as soon as the barley is off the ground, and lay on dung after the first crop of grass is mowed.—The decided superiority of the Middlesex farmers in the art of hay-making, has been acknowledged by all who make any pretensions to agricultural skill. They reduce it to a regular system, unknown in other parts of the kingdom. When the grass is about to be mown, the farmer engages a certain number of persons for that work, according to the extent of his lands. At the same time he provides five hay-makers to each mower, who are paid by the day. On the first day all the grass mown before nine o'clock is tedded; in which operation great care is taken to shake it out well, and strew it evenly over the ground. After this, it is turned once or twice with similar care; and in the course of the afternoon, is raked into what is called single wind-rows, and towards the evening is put into grass-cocks. On the second day, the business commences by tedding all the grass mown on the first day after nine o'clock, and on this day before nine o'clock. Next, the grass-cocks are well shaken out into separate plats, called staddles, of five or six yards diameter; the staddles are next turned, and after that is done, the grass tedded in the morning is turned once or twice in the manner above described, for the first day. After dinner the staddles are formed into double wind-rows; the grass is next raked into single wind-rows; then the double wind-rows are put into bastard cocks; and lastly, the single wind-rows are put into grass-cocks. On the third day, the grass mown and not spread on the second day, and that also mown in the early part of this day, is first tedded in the morning, and the grass-cocks are spread into staddles, as before, and then the bastard-cocks into staddles of less extent. These lesser staddles, though last spread, are first turned, then those that were in the grass-cocks, and lastly the grass once or twice; after which, the people go to dinner. Should the weather prove fine, the hay which was in bastard-cocks the preceding night, will this afternoon be in a proper state to be carried, but not if the weather has been cloudy and cool. In the latter case, the first operation after dinner is to rake the grass-cocks of the last night into double wind-rows, and the grass which was this morning spread from swaths into single wind-rows. Afterwards, the bastard-cocks of the last night are made up into full-sized cocks, and care taken to rake the hay up clean, and also to put the rakings upon the top of each cock. Next, the double wind-rows are put into bastard-cocks, and the single wind-rows into grass-cocks, as on the preceding days. On the fourth day the great cocks are usually carried before dinner. The other operations of the day are conducted in the same routine as those already described, and so on daily till the harvest is finished.—The manner and period of applying the manure, are studied by the Middlesex farmers with the greatest attention. They observe the state of the atmosphere, and should it indicate rain after the hay is removed from the ground, they put the dung of neat cattle upon it. Should the barometer however not promise rain in considerable quantities, the decomposed manure is allowed to remain on the dunghills till the end of September, at which time it is put on while the ground is dry enough to bear the loaded carts without injury. Meadow land, in the occupation of cow-keepers, is usually mown

two or three times during summer; the great number of cows kept by them enabling them to dress it every year. As their chief object is to obtain their hay of a soft grassy nature, they cut it young, conceiving it to be better provender for milk cows in that state than after the seedling stems have risen.

The following very useful list of herbs of pasture, and of such plants as are commonly found growing among grass, whether useful or hurtful, is here inserted for the accommodation of the farmer, agriculturist, and florist. It is arranged alphabetically under the common English names, with a reference to their *Botanical Names*, to which they can readily refer in the other parts of this work; and where they may find a full description, with interesting particulars.

Adder's-Tongue, Common. See *Ophioglossum Vulgatum.*
Agrimony, Common. See *Agrimonia Eupatoria.*
Anemone, Wood. See *Anemone Nemorosa.*
Archangel, White. } See *Lamium Album*, and *Lamium*
Archangel, Purple. } *Purpureum.*
Arsesmart. See *Polygonum Hydropiper.*
Basil. See *Clinopodium.*
Bedstraw. See *Galium.*
Bellflower. See *Campanula.*
Betony, Wood. See *Betonica Officinalis.*
Bluebottle. See *Centaurea.*
Brakes. See *Pteris.*
Bugle, Common. See *Ajuga Reptans.*
Burnet. See *Poterium* and *Sanguisorba.*
Butterbur. See *Tussilago.*
Buttercups. See *Ranunculus.*
Cammock. See *Ononis.*
Camomile. See *Anthemis.*
Campion. See *Agrostemma* and *Cucubalus.*
Caraways. See *Carum.*
Carrot. See *Daucus.*
Catmint. See *Nepeta.*
Cheese Renning. See *Galium.*
Chickweed. See *Alsine* and *Arenaria.*
Cinquefoil. See *Potentilla.*
Clary. See *Salvia.*
Clover. See *Trifolium.*
Cock's-comb. See *Rhinanthus.*
Coltsfoot. See *Tussilago.*
Corn Salad. See *Valeriana.*
Cow Parsnep. See *Heracleum.*
Cow Weed. See *Chærophyllum.*
Cow Wheat. See *Melampyrum.*
Cowslip. See *Primula Vulgaris.*
Crane's Bill. See *Geranium.*
Crowfoot. See *Ranunculus.*
Cuckow Flower. See *Cardamine.*
Cudweed. See *Gnaphalium.*
Daisy. See *Bellis.*
Dandelion. See *Leontodon.*
Devil's Bit. See *Scabiosa.*
Dock. See *Rumex.*
Dropwort. See *Spiræa.*
Elecampane. See *Inula.*
Fern. See *Filex* and *Pteris.*
Flag. See *Iris.*
Fleabane. See *Inula.*
Foxglove. See *Digitalis.*
Garlick. See *Allium.*
Goat's Beard. See *Tragopogon.*
Harebells. See *Hyacinthus.*
Hawkweed. See *Hieracium.*
Heath. See *Erica.*
Hemlock. See *Conium.*
Kidney Vetch. See *Anthyllis.*
Knapweed. See *Centaurea Nigra.*
Knot-Grass. See *Polygonum Aviculare.*
Ladies' Bedstraw. See *Galium.*
Ladies' Finger. See *Anthyllis.*
Ladies' Mantle. See *Alchemilla.*
Ladies' Smock. See *Cardamine.*
Lamb's Lettuce. See *Valeriana.*
Lucern. See *Medicago.*
Meadow Rue. See *Thalictrum.*
Meadow Saffron. See *Colchicum.*
Meadow Saxifrage. See *Peucedanum.*
Meadow Sweet. See *Spiræa.*
Milfoil. See *Achillea.*
Milkwort. See *Polygala.*
Mint. See *Mentha.*
Mouse-ear Scorpion-grass. See *Myosotis.*
Nettle, Dead. See *Lamium.*
Nonesuch. See *Medicago.*
Nut, Earth or *Pig.* See *Bunium.*
Oxe-eye Daisy. See *Chrysanthemum.*
Pagils. See *Primula.*
Parsnep. See *Pastinaca.*
Pasque Flower. See *Anemone.*
Penny-Grass. See *Rhinanthus.*
Pilewort. See *Ranunculus.*
Plantain, Great. See *Plantago Major.*
Plantain Ribwort. See *Plantago Lanceolata.*
Poppy, Spatling. See *Cucubalus.*
Primrose. See *Primula.*
Ragwort. See *Senecio.*
Ramsons. See *Allium.*
Rattle, Red. See *Pedicularis.*
Rattle, Yellow. See *Rhinanthus.*
Rest-harrow. See *Ononis.*
Rib-grass. } See *Plantago.*
Ribwort. }
Rush. See *Juncus.*
Sage. See *Salvia.*
Sainfoin. See *Hedysarum.*
Saint John's Wort. See *Hypericum.*
Satyrion. See *Satyrium.*
Saw-wort. See *Serratula.*
Scabious, Sheep's. See *Jasione.*
Scorpion Grass. See *Myosotis.*
Self-heal. See *Prunella.*
Silver Weed. See *Potentilla.*
Sorrel. See *Rumex.*
Succory. See *Cichorium.*
Tare. See *Ervum* and *Vicia.*
Thistle. See *Carduus* and *Serratula.*
Thyme. See *Thymus.*
Toad-flax. See *Antirrhinum.*
Toad-flax, Bastard. See *Thesium.*
Tormentil. See *Tormentilla Erecta.*
Trefoil. See *Medicago* and *Trifolium.*
Trefoil, Bird's-foot. See *Lotus.*
Valerian. See *Valeriana Officinalis.*
Vetch. See *Vicia.*
Wild Williams. See *Lychnis.*
Wild Woad. See *Reseda*
Yarrow. See *Achillea.*

Most of the plants of the above list are beneficial in some respect or other, though not always in regard to cattle.

Their qualities and uses are pointed out under their botanical names, as they occur in the regular arrangement of the genera to which they belong. It may save much trouble to inform the reader, that the following plants are useful, either as medicine, or good for quadrupeds. Cardamine Pratensis, Rumex, Acetosa, Tragopogon; most of the leguminous plants, as Lotus, the Vetches in general, the Medicago, and especially the Trefoils, Milfoil, Succory, and Ribwort, which are weeds in their wild state, are so much improved by cultivation as to become useful plants. The principal pasture herbs that are injurious are the following: Allium Vineale and Ursinum; Anemone Nemorosa; Bellis Perennis, occupying so much room; Caltha Palustris; the various species of Thistle, and of Carex or Sedge; Centaurea Nigra, Calcitrapa; Chærophyllum; Chrysanthemum Leucanthemum; Colchicum, Erica, Heracleum, Sphondylium, Inula Dysenterica, Rushes, Mercurialis Perennis, Pedicularis, Pteris, several sorts of Ranunculus; and Rhinanthus Crista Galli, which is almost the only annual plant which keeps its ground in pastures to any great extent, owing to its seeding early. It can only be kept down by pasturing the ground two years successively. Other annuals, such as Purging Flax, the Eyebrights, Hawkweeds, and Sheep's Scabious, being of little consequence. Rumex and Senecio Jacobæa are also injurious. In order to extirpate these weeds from pastures, the docking iron, the spud, and the hand, should be unremittingly employed on fit occasions. The biennial thistles may be cut off within the ground, and, if not suffered to seed, may be easily destroyed, unless renewed from their nurseries in hedge-rows, way-sides, &c. The Carduus Acaulis ought to be diligently cut up with the spud; but it infests only dry upland pastures. The Serratula Arvensis is a true perennial, and runs dreadfully at the root; thus increasing two ways, by root and seed: it is rather an arable weed, and cannot be extirpated by ploughing three inches deep. This is common in rich pastures in the neighbourhood of arable lands, head-lands, and way-sides, where it is suffered to seed without control. In mowing-grounds, it is seldom suffered to seed; but mowing certainly tends to spread it, if it be cut down while in flower, though some think it destroys it. The only radical cure for this evil in pastures is, to extirpate the plants by the docking iron and the hand after rain, when alone they will pull out, and even then seldom completely. The ground therefore must be carefully looked over a second time, to take out those thistles which have sprung up from pieces of roots left in on the first operation. The Carices or Sedges, the Junci or Rushes, Caltha or Marsh Marigold, Iris or Flag, Pedicularis or Red Rattle, the whole tribe of water plants, and such as require a soil tenacious of wet, can only be effectually destroyed by judicious draining and dressing with coal-ashes, and other warm manures. Fern or Brakes must be extirpated by paring and burning. The Docks, Ragwort, and Knapweed, will yield only to the docking iron and the hand; and should never be suffered to seed, nowithstanding the notion that prevails in the inland counties, that the best way to get rid of Docks on grass-land, is to let them spend themselves by seeding: if the old plant be thus spent, it leaves an innumerable progeny to represent it.—The following four things are necessary in order to improve pasture-land: 1. Draining and watering, for each of which see *Meadows*. 2. Weeding and top-dressing. 3. Laying the land so as to clear itself of surface water, levelling ant-hills and other inequalities, and running a heavy roller over it in the spring. 4. Putting on different stock at proper seasons, so that the herbage may be kept fine by being closely bitten, and the surface regular by not being poached in wet times, by heavy cattle. Not a weed should be suffered to seed, nor a tuft of stale grass to stand in a pasture-ground, which should not at least once during the summer be levelled with the scythe; thus at a small expense weeds will be converted into nutriment, and waste ground into after-grass. See *Grass* and *Meadows*.

Pavetta; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth bell-shaped, very small, obsoletely four-toothed, surrounding the germen. *Corolla:* one-petalled, funnel-form; tube long, slender, cylindric; border five-parted, spreading, shorter by half than the tube; segments lanceolate. *Stamina:* filamenta four, very short, above the throat of the corolla; antheræ awl-shaped, spreading, the length of the border. *Pistil:* germen inferior, turbinate; style filiform, twice as long as the corolla; stigma thickish, oblong, oblique. *Pericarp:* berry roundish, one-celled. *Seeds:* two, convex on one side, cartilaginous. *Observe.* Berry two-celled. *Seeds:* solitary, one often abortive, so that the fruit seems to be one-seeded. There are frequently two coadunate berries, crowned with a double calix.—To avoid confusion, Loureiro would place such of these plants as have a one-seeded berry in this genus; such as have a two-seeded berry in that of *Ixora;* and those which have a one-celled two-seeded berry, in a new genus. Essential Character. *Corolla:* one-petalled, funnel-form, superior. *Stigma:* curved. *Berry:* two-seeded, one often abortive.——The species are,

1. Pavetta Indica. Smooth: leaves lanceolate, elliptic, stipules smooth within; calices obsoletely four-toothed; flowers in bundles, very white; corymbs trichotomous, fastigiate, on a long filiform peduncle.—Native of the East Indies.

2. Pavetta Villosa. Branches and calices villose, hoary; leaves lanceolate-elliptic; flowers in bundles. Branches opposite, four-cornered, jointed, densely villose, hoary; the last joints more compressed.—Found in Arabia Felix.

3. Pavetta Longiflora. Branches smooth; leaves lanceolate, elliptic; stipules hairy within; calices four-cleft; flowers in bundles. It may be doubted whether it is any thing more than a variety of the preceding. The branches and leaves are quite smooth; the calix has a few small hairs scattered over it, not visible without a magnifier; corolla an inch and half in diameter.—Native of Arabia Felix.

4. Pavetta Caffra. Leaves obovate; flowers subumbellate; calices bristle-awned. This is a smooth tree, with round branches; heads of flowers sessile, terminating the shorter branchlets.—Native of the Cape.

5. Pavetta Pentandria. Leaves oblong, lanceolate, acuminate; panicle trichotomous, axillary; flowers five-stamined, white, highly fragrant, appearing in the vernal months. This is a shrub, with a stem the height of a man, upright, branched, even. It flowers in the spring, and is commonly called in Jamaica Wild Coffee: it is as it were a middle species between *Psychotria*, *Coffea*, and *Pavetta*, which are very nearly allied; but it seems to approach nearest to the last in its inflorescence, and the form of the flowers, although they have five stamina.—Native of the West Indies.

6. Pavetta Arenosa. Branches brachiate; leaves tubercled, opposite. This is an unarmed shrub, upright, four feet high, with many brachiate reclining branches. There are so many prominent tubercles on each side of the leaves, that they appear as if they had sand sprinkled on them, and hence the Chinese call this the *Sand Plant*. Flowers white, terminating, fastigiate.—Native of China, near Canton.

7. Pavetta Parasitica. Stem parasitical; leaves in whorls; flowers in little axillary balls.—This is common upon trees in the gardens of Cochin-china.

Paullinia; a genus of the class Octandria, order Trigynia. —Generic Character. *Calix:* perianth five-leaved; leaflets ovate, concave, spreading, permanent; the two outer opposite, one of the inner larger. *Corolla:* petals four, obovate-oblong, twice as large as the calix, clawed, two more distant; nectaries two, one four-petalled, inserted into the claws of the corolla, the other of four glands at the base of the petals. *Stamina:* filamenta eight, simple, short, united at the base; antheræ small. *Pistil:* germen turbinate, three-sided, blunt; styles three, filiform, short; stigmas simple, spreading. *Pericarp:* capsule large, three-sided, three-celled, three-valved. *Seeds:* solitary, obovate. *Observe.* According to Plumier, the second species has a large three-sided, three-celled, three-valved capsule, and the fourth three capsules jointed in the middle, but separable, bearing the seeds at top, winged below. Essential Character. *Calix:* five-leaved. *Petals:* four. *Nectary:* four-leaved, unequal. *Capsule:* three, compressed, membranaceous, connate.—To propagate the plants of this genus, procure the seeds from the countries where they naturally grow. As soon as they arrive, sow them in small pots, filled with light earth, and plunge them into a moderate tan-bed. If the seeds arrive in autumn, plunge the pots into the bark bed in the stove, and probably the plants may come up the following spring; but if they arrive in spring, plunge the pots into a moderate hot bed under a frame, where they may be continued all the summer; in autumn remove them into the stove for the winter, watering them now and then sparingly. The following spring plunge the pots into a new hot-bed under a frame, which will bring up the plants in about six weeks, if the seeds be good. When the plants are fit to remove, plant each in a small pot filled with light earth, and plunge them into a hot-bed of tanner's bark, observing to shade them till they have taken new root; after which they should have free air admitted to them daily, in proportion to the warmth of the season. In the autumn they must be removed into the bark-stove, where they must constantly remain. As they require much room and have little beauty, they are seldom propagated in Europe.——The species are,

1. Paullinia Asiatica; *Asiatic Paullinia.* Leaves ternate; petioles and stem prickly, round; flowers white, smelling strongly; fruit commonly tricoccous, but sometimes quadricoccous, and even pentacoccous, saffron-coloured, with black spots, of an acrid taste with some sweetness.—Native of the East Indies.

2. Paullinia Seriana. Leaves ternate; petioles naked; leaflets ovate-oblong. Receptacle a white fungose tubercle, growing to the axis of the fruit.—Native of S. America.

3. Paullinia Nodosa. Leaves ternate; petioles naked; middle leaflet obovate.—Native of South America.

4. Paullinia Cururu. Leaves ternate; petioles margined. —Native of South America.

5. Paullinia Mexicana; *Mexican Paullinia.* Leaves biternate; all the petioles margined; stem prickly.—Native of Mexico.

6. Paullinia Carthaginensis; *Carthaginian Paullinia.* Leaves biternate; all the petioles margined; stem unarmed. This has the leaves more cut than the other species; and they are very thin, whereas in the rest they are more or less coriaceous and thick. It is entirely void of prickles.—Native of Carthagena, New Spain.

7. Paullinia Caribæa; *Caribbæan Paullinia.* Leaves biternate; all the petioles margined; branches prickly.—Native of the Caribbees.

8. Paullinia Curassavica; *Shining-leaved Paullinia.* Leaves biternate; all the petioles margined; branches margined.—Native of Curaçao. Swartz says, it is common in the woods of Jamaica, with its slender, woody, flexile stalk, raising itself frequently to a very considerable height among the bushes; it is so tough and yielding that it is commonly cut into junks, barked, and used for riding and walking sticks.

9. Paullinia Barbadensis; *Barbadoes Paullinia.* Leaves biternate; middle petiole margined, the rest naked. This differs from the preceding principally in the form of the leaves, and the slighter and less frequent incision of them. —Native of the West Indies.

10. Paullinia Divaricata. Leaves biternate; leaflets ovate, acute, mostly entire; petioles naked; panicles divaricating; wings of the capsules ovate.—Native of Jamaica.

11. Paullinia Polyphylla; *Parsley-leaved Paullinia*, or *Supple Jack.* Leaves triternate; petioles naked.—Native of the West Indies.

12. Paullinia Triternata. Leaves triternate; petiolets margined. This climbs to the height of twenty feet; branches round, smooth, grooved, long, flexible.—Native of woods in the island of St. Domingo.

13. Paullinia Japonica; *Japanese Paullinia.* Leaves quinate, pinnate, petioletted, margined; stem herbaceous, unarmed; flowers opposite to the leaves, panicled; peduncles the length of the leaves.—Native of Japan.

14. Paullinia Vespertilio. Leaves pinnate; leaflets ovate, acuminate, gashed; petioles naked; capsules pedicelled, with horizontal lanceolate wings.—Native of the West Indies.

15. Paullinia Pinnata; *Winged-leaved Paullinia.* Leaves pinnate; petioles margined; leaves shining.—Native of Brazil, Jamaica, and St. Domingo, in dry sandy places.

16. Paullinia Tomentosa; *Downy-leaved Paullinia.* Leaves pinnate; petioles margined; leaflets tomentose.—Native of South America.

17. Paullinia Diversifolia; *Different-leaved Paullinia.* Leaves superdecompound; petioles margined, the lowest pinnate, the rest ternate.—Native of South America.

Paul's Betony. See *Veronica.*
Pea. See *Pisum.*
Pea, Everlasting. See *Lathyrus.*
Pea, Heart. See *Cardiospermum.*
Pea, Pigeon. See *Cytisus.*
Pea, Sweet. See *Lathyrus.*
Pea, Winged. See *Lotus.*
Peach Tree. See *Amygdalus.*
Pearl-wort. See *Sagina.*
Pear Tree. See *Pyrus.*
Pecten Veneris. See *Scandix.*

Pectis; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common, five-leaved, cylindric; leaflets lanceolate, blunt, almost equal. *Corolla:* compound, rayed; corollets hermaphrodite, about six in the disk, Gærtner says four; females about five in the ray, Gærtner says about six; proper of the hermaphrodite funnel-form, five-cleft; of the female ligulate, ovate, (or, according to Gærtner, quite entire,) shorter than the calix. *Stamina:* in the hermaphrodites, filamenta five, short; antheræ cylindric, tubular. *Pistil:* in the hermaphrodites, germen linear; style filiform; stigma bifid: in the females, germen linear; style filiform; stigmas two, revolute. *Pericarp:* none. *Calix:* unchanged, spreading. *Seeds:* in the florets, solitary, linear; down with two or three spreading awns, various in length and breadth. *Receptacle:* naked. Essential Character. *Calix:* five-leaved, cylindric. *Florets* of the ray: five. *Down:* awned. *Receptacle:* naked.—— The species are,

1. Pectis Ciliaris. Leaves linear, ciliate. Root branched,

with filiform radicles; stem herbaceous, half a foot high, branched, dichotomous, diffused, round, smooth. The leaves when bruised have a sweet smell like Savory. Annual.—It flowers in June, and is a native of Hispaniola.

2. Pectis Punctata. Leaves linear, quite entire, dotted underneath. Stem herbaceous, a foot high or more, angular, branched, smooth; branches opposite, erect, axillary.—Native of sandy coasts in Hispaniola.

3. Pectis Linifolia. Leaves linear, quite entire, even on both sides. This plant is spreading and slender, and seldom rises above eighteen or twenty inches in height. Annual.—Common in all the sugar islands of the West Indies.

4. Pectis Humifusa. Leaves ovate, dotted underneath, ciliate on both sides at the base. Annual.—Native of Guadaloupe and Santa Cruz.

Pedalium; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth five-parted, small, permanent; the upper segment very short, the lowest longer. *Corolla:* one-petalled, subringent; tube three-cornered, with the belly flat; border five-cleft, wide, oblique; segments rounded; upper ones smaller, lowest wider. *Stamina:* filamenta four, glandular-hairy at the base, shorter than the tube, two shorter than the rest; antheræ cordate, twin, terminated by a gland; rudiment of a fifth filamentum between the shorter stamina, with a very small antheræ. *Pistil:* germen conical; style the length of the stamina; stigma bifid, the upper segment reflex, the lower revolute. *Pericarp:* drupe juiceless, ovate, pyramidal, four-cornered, the corners thorny towards the base. *Seed:* nut, covered with bony fibres variously interwoven, four-winged, two-celled; nucleuses two, oblong, covered with an aril, one lower. Gærtner observes, that there is a void cell below the fertile ones. Essential Character. *Calix:* five-parted. *Corolla:* subringent, with a five-cleft border. *Nut:* suberous, four-cornered, thorny at the corners, two-celled. *Seeds:* two.——The only known species is,

1. Pedalium Murex; *Prickly-fruited Pedalium.* Stem simple; leaves opposite, obovate, blunt, toothed, truncated, naked, with the petioles glandular on each side; flowers axillary, solitary, small; fruit nodding. This plant smells very strongly of musk while in flowers.—Native of maritime situations in the East Indies.

Pedicularis; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, roundish, ventricose, with a five-cleft equal mouth, permanent. *Corolla:* one-petalled, ringent; tube oblong, gibbous; upper lip helmet-shaped, erect, compressed, emarginate, narrower; lower spreading, flat, half three-cleft, blunt; middle segment narrower. *Stamina:* filamenta four, the length of the upper lip, under which they lie concealed; two shorter; antheræ incumbent, roundish, compressed. *Pistil:* germen roundish; style filiform, in the same situation with the stamina, but longer; stigma blunt, bent in. *Pericarp:* capsule roundish, mucronate, oblique, two-celled, opening at top; partition contrary. *Seeds:* several, ovate, angular; receptacle subglobular, in the base of the capsule. Essential Character. *Calix:* five-cleft. *Capsule:* two-celled, mucronate, oblique. *Seeds:* coated. This is a beautiful genus of plants; but are with difficulty preserved in gardens, being mostly inhabitants of boggy alpine places. ——The species are,

1. Pedicularis Palustris; *Marsh Lousewort*, or *Red Rattle.* Stem branched; calices crested, callous, dotted; lip of the corollas oblique. Root annual; stem about a foot high, upright, angular, purplish, hollow; branches spreading; leaves and flowers distant; corolla purple, varying to white. It is an unwelcome guest in meadows, being disagreeable to cattle, and thought by some to be destructive to sheep: it is rather caustic, and appears to be seldom eaten.—Native of many parts of Europe, particularly the northern parts, in marshes and wet meadows; flowering in June and July.

2. Pedicularis Sylvatica; *Pasture Lousewort*, or *Heath Red Rattle.* Stem branched at the base; calices oblong, angular, even; lip of the corollas cordate. Root annual; branches from the root, long, spreading close to the ground; leaves simply pinnate, with roundish acutely serrate pinnas; flowers rose-coloured, in a cluster at the top of the plant, and sparingly on the branches. The expressed juice, or a decoction of this plant, has been used with advantage as an injection for sinuous ulcers. It is said that if the healthiest flocks of sheep were fed with this plant, they would become scabby in a short time, that the wool would get loose, and that they would be overrun with vermin. This is also applied to the preceding species; but the fact seems to be, that the presence of these plants indicates a very bad pasture, and the want of proper food may occasion the cattle to fall into bad condition, and to breed vermin.—It flowers in June, and is a native of many parts of Europe and Siberia, where it is found in wet pastures and heaths.

3. Pedicularis Rostrata; *Beaked Lousewort.* Stem ascending, slightly leafy; helmet of the corollas acuminate, beaked; calices crested, subhirsute. Root black, thick, having large fibres swelling out a little in the middle.—Native of Switzerland, Austria, Carniola, Dauphiny, Piedmont, and Silesia, on the most lofty mountains.

4. Pedicularis Sceptrum Carolinum; *Sceptred Lousewort.* Stem simple; flowers by threes, in whorls; corollas closed; calices crested; capsules regular. This is distinguished from the other species by the gape of the corolla being closed, the pericarp roundish and acuminate, but regular, whereas in the others it is bent with an oblique point. It was called Scéptrum Carolinum (in honour of Charles XII.) by Rudbeck, who discovered it in Lapland, where it was also found by Linneus, in such abundance at one place on the highway, that it stopped a horse going full speed. It grows also in Dalecarlia, Ostrobothnia; between i and Ulloa; near Upsala in Westrogothia; and sometimes, but more rarely, in bogs, wet woods, &c. in Norway, Prussia, and Russia.

5. Pedicularis Verticillata; *Whorled Lousewort.* Stem simple; leaves in fours; root more simple, or less branched than in the other sort; flowers red; they are small and beautiful. It appears to be biennial.—Native of Switzerland, Austria, Carniola, the south of France, Silesia, and Siberia.

6. Pedicularis Resupinata; *Topsy-turvy Lousewort.* Stem simple; leaves lanceolate, serrate, crenulate; flowers resupine; corolla of a very deep purple, turned upside down; helmet hooked, compressed; standard white, rounded. It varies with flesh-coloured and milk-white flowers.—Native of Siberia.

7. Pedicularis Recutita; *Jagged-leaved Lousewort.* Stem simple; leaves pinnatifid, serrate; spike leafy; calices coloured; corollas blunt. Root perennial, woody.—Native of Switzerland, Austria, and Silesia.

8. Pedicularis Tristis; *Dull-coloured Lousewort.* Stem simple; helmet of the corollas villose at the edge. This is a very hairy plant; flowers heaped into a spike or head.—Native of Siberia.

9. Pedicularis Flammea; *Upright Lousewort.* Stem simple; leaves pinnate, imbricate backwards. This at first resembles the fourth species in miniature, but it is only three or four inches high; spike terminating the stem, and covering a third part of it, upright, compressed, oblong; corolla

narrow, deep yellow, the lower lip very small, the upper narrow, almost upright, blunt.—Native of Lapland, Switzerland, Silesia, and Siberia.

10. Pedicularis Hirsuta; *Hairy Lousewort.* Stem simple; leaves tooth-pinnate, linear; calices hirsute. Root perennial; spike terminating, very short, but thick and quadrangular; flowers six to twelve, yellow, sessile. It differs from the rest, in its widely embracing petioles, villose calices, the colour of the corolla, and the notches of the leaves.—Native of Lapland, Dauphiny, Piedmont, and Siberia.

11. Pedicularis Rosea; *Rose-coloured Lousewort.* Stem simple; leaves pinnate; pinnas oblong, pinnatifid; calices hirsute; spike when young close, afterwards loose, with small bractes; corolla red. This plant has seldom more than one, two, or three stems from a root.—Native of Carinthia.

12. Pedicularis Incarnata; *Flesh-coloured Lousewort.* Stem simple; leaves pinnate, serrate; calices rounded, smooth; helmet of the corollas hooked, acute; flowers many, red, in a long loose spike. There is one variety which is smaller, and smooth: and another with the leaves less cut, and almost simple; the stem lower, and the flowers fewer, the colour of fire, inclining more or less to yellow.—Native of Switzerland, Austria, Dauphiny, Silesia, and Siberia.

13. Pedicularis Lapponica; *Lapland Lousewort.* Stem simple; leaves pinnatifid, serrate; calices bifid, blunt; root perennial; corolla yellow, with the upper lip compressed, produced at the tip, reflexed downwards, and prominent like an eagle's beak.—Native of the mountains of Lapland, and Dalecarlia, Denmark, and Siberia.

14. Pedicularis Comosa; *Spiked Lousewort.* Stem simple; spike leafy; helmet of the corollas acute, emarginate; calices five-toothed; lateral roots whitish, tuberous, thicker at the end, the middle root is bigger and blackish.—Native of the mountains of Italy, Dauphiny, and Siberia.

15. Pedicularis Foliosa; *Leafy-spiked Lousewort.* Stem simple; spike leafy; helmet of the corollas very blunt, entire; calices five-toothed. Root simple, biennial. Gouan remarks, this is very different from the other species, even when not in flower.—Native of Switzerland, Austria, and France.

16. Pedicularis Canadensis; *Canadian Lousewort.* Stem simple; spike somewhat leafy; helmet of the corollas bristly, two-toothed; calices truncated downwards. Root perennial. —Native of North America.

17. Pedicularis Tuberosa; *Tuberous Lousewort.* Stem simple; calices crested; helmet of the corollas hooked-beaked. Root thick, and a little tuberous, black, and fibrous. The flowers form a very thick spike, closer at top than at bottom, they are yellowish or whitish; the upper lip of the corolla is sickle-shaped.—Native of the Swiss, Italian, and Siberian mountains.

18. Pedicularis Gyroflexa. Leaves bipinnate; leaflets somewhat toothed, curled, and blunt; flowers turned to the left, hooked-headed. Root perennial, composed of a dark black trunk, often carious, three or four lines in diameter, from which spring thick lateral fibres, horizontal, quite simple, pretty long, not at all swelling out any more than the trunk of the root. There is a variety with finer and more distinct leaves, a yellow flower, and the pistil longer than the corolla. —Native of the south of France, Switzerland, Carniola, and Piedmont.

19. Pedicularis Greenlandica. Stem simple; leaves pinnate, serrate; calices oblong, smooth; helmet of the corollas awl-shaped, bowed, longer.—Native of Greenland.

20. Pedicularis Lanceolata. Stem simple; leaves lanceolate, inciso-dentate; spikes aphyllous; calices glabrous; capsules short.—Grows in the Illinois country.

21. Pedicularis Gladiata. Stem simple; leaves lanceolate, pinnatifid, dentated; spikes leafy, rough; flowers alternate, yellow, tinged with purple.—Grows in rich soil, and grassy moist places, from Pennsylvania to Virginia.

Peganum; a genus of the class Dodecandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved; leaflets linear, often toothed, erect, the length of the corolla, acute, permanent. *Corolla:* petals five, oblong, ovate, from upright spreading. *Stamina:* filamenta fifteen, awl-shaped, shorter by half than the corolla, dilated at the base into a cup-like nectary under the germen; antheræ oblong, erect. *Pistil:* germen roundish, three-cornered, raised on a receptacle from the base of the flower; style filiform, round, the length of the antheræ; stigma oblong, three-sided. *Pericarp:* capsule roundish, three-cornered, three-celled, three-valved, with contrary partitions. *Seeds:* very many, ovate-acuminate. *Observe.* This genus differs from *Ruta*, as *Celastrus* from *Euonymus;* for what is taken from the number of the pistil, is added to the stamina, and *vice versa.* Essential Character. *Calix:* five-leaved, or none. *Corolla:* five-petalled. *Capsule:* three-celled, three-valved, many-seeded.——The species are,

1. Peganum Harmala; *Syrian Rue.* Leaves multifid. Root as large as a man's little finger, and becoming woody by age; the stalks decay every autumn, and new ones arise in the spring; they grow about a foot long, and divide into several small branches, at the ends of which the flowers are produced, sitting close between the leaves; corolla white. Willich remarks, that the calix should rather be considered as a floral leaf; for it has the same structure with the leaves, and is perfect and expanded long before the opening of the flower. It flowers in July, and in warm seasons the seeds will ripen here in the autumn.—Native of Spain, the county of Nice, of Syria, Cappadocia, Galicia, and Siberia.—Both it and the next species are propagated by seed, sown thinly on a bed of light earth, in the beginning of April: when the plants come up, keep them clean from weeds; at the end of October, or beginning of November, when the stalks decay, cover the bed with tanner's bark, ashes, or saw-dust, to keep out the frost, for the roots are somewhat tender when young. In March following, transplant them into a warm situation and dry soil, where they will continue for several years.

2. Peganum Dauricum. Leaves lanceolate, slightly crenate; stem herbaceous.—Native of Siberia.

3. Peganum Retusum. Leaves wedge-shaped, abrupt; stem shrubby. A shrub, with spinous, downy branches; called by the Arabians *Gharghed.*—It grows near Alexandria in Egypt.

Pelargonium; a genus of the class Monadelphia, order Heptandria.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments ovate, acute, concave, permanent; upper segments ending in a capillary nectariferous tube, decurrent along the peduncle. *Corolla:* petals five, obcordate or ovate, spreading, large, irregular. *Stamina:* filamenta ten, awl-shaped, united at the base, spreading at top, unequal, at length all shorter than the corolla, three of them sometimes, but seldom five, castrated; antheræ seven, oblong, versatile. *Pistil:* germen five-cornered, beaked; style awl-shaped, longer than the stamina, permanent; stigmas five, reflex. *Pericarp:* capsule five-grained, beaked, the cells opening inwards, the beak spiral, bearded on the inside. *Seeds:* solitary, ovate, oblong. Essential Character. *Calix:* five-parted, the upper segment ending in a capillary, nectariferous tube, running along the flower-stalk. *Corolla:* five-petalled, irregular. *Filamenta:* ten, unequal, three of which, seldom five, are castrated. *Fruit:* five-grained, beaked; beak spiral, bearded within.——The species are,

* *Stemless: Root Turnip-like: Umbel compound.*

1. Pelargonium Hirsutum; *Various-leaved Crane's Bill.* Leaves obovate or lanceolate, quite entire or pinnatifid, rough-haired, ciliate; root turbinate, perpendicular, at the upper part thickened and imbricate as it were with red stipules; stem none, except peduncles or scapes, on which there is one leaf near the origin of the umbels; flowers umbelled. Native of the Cape of Good Hope.—All the species of this genus may be propagated by seeds: they may be sown upon a bed of light earth towards the end of March, where the plants will appear in a month or five weeks after, and will be fit to remove by the beginning of June, when they should be carefully taken up, and each planted into a separate pot filled with light kitchen-garden earth, and placed in a shady situation till the plants have taken new root; then they may be removed into a sheltered situation, and placed among other of the hardier green-house plants, where they may remain till autumn, when they must also be removed into the green-house, and treated in the same manner as other hardy kinds of green-house plants. But those who are desirous of having their plants large and flowering soon, sow the seeds upon a moderate hot-bed in the spring, because they will then come up much sooner, and will be fit to remove long before those which are sown in the open air; yet when these plants come up, there must be great care taken to prevent their becoming weak; and when they are transplanted, the pots should be plunged into another moderate hot-bed, observing to shade them from the sun till they have taken new root; then they must be gradually inured to bear the open air, into which they should be removed at the beginning of June, and placed in a sheltered situation with other exotic plants. If these plants be brought forward in the spring, most of the sorts will flower in the same summer, and the plants being strong before the winter, will make a better appearance in the green-house.—The shrubby African Geraniums are commonly propagated by cuttings, which if planted in a shady border in June or July, will take good root in five or six weeks, and may then be taken up, and planted into separate pots, placing them in the shade till they have taken new root; after which they may be removed into a sheltered situation, and treated in the same manner as seedling plants. They should be hardened gradually in the spring, and towards the middle or end of May they may be taken out of the green-house, and at first placed under the shelter of trees, where they may remain a fortnight or three weeks to harden, and then should be removed into a situation where they may be defended from strong winds, and enjoy the morning sun till eleven o'clock; where they will thrive better than in a warmer situation. As they grow pretty fast, they soon fill the pots with their roots; and if they stand long unremoved in summer, they frequently put out their roots through the holes at the bottom of the pots into the ground, and then the plants will grow vigorously; but when they are suffered to grow long in this manner, it will be difficult to remove them, for if their roots be torn off, all the younger branches will decay, and many times the plants are killed. Therefore the pots should be moved once in a fortnight or three weeks, in the summer months, and the roots, which may be then pushing through the holes in the pots, cut off, to prevent their striking into the ground. These plants will also require to be new-potted at least twice in the summer; the first time should be after they have been three weeks or a month out of the green-house; the second should be toward the end of August or the beginning of September, that the plants may have time to establish their new roots before they are removed into the green-house. When these are new potted, all the roots on the outside of the balls of earth should be carefully pared off, and as much of the old earth drawn away from the roots as can be done with safety to the plants; then, if they require it, they should be put into pots a size larger than those out of which they were taken, putting a quantity of fresh earth into the bottom of the pot; then place the plants upon that, being careful that the ball about the roots of the plant is not so high as the rim of the pot, that some room may be left to contain the water which may be given to the plants. Then the cavity all round the ball should be filled up with fresh earth, which should be gently pressed down, and the bottom of the pot beaten upon the ground to settle down the earth; then the plant should be well watered, and the stem fastened to a rail, to prevent the wind from displacing the roots before they are fixed in the new earth. The compost in which these plants thrive best, (where there is not a conveniency of getting some good kitchen-garden earth,) is fresh hazel-loam from a pasture, mixed with a fourth or fifth part of rotten dung: if the earth be inclinable to bind, then a mixture of rotten tan is preferable to dung; but if it be light and warm, then a mixture of cow-dung is best: this compost should be mixed three or four months before it is used, and should be turned over three or four times, that the parts may be well mixed and incorporated; but where a quantity of good kitchen-garden earth can be had, especially if it be such as has been well worked, and is clean from the roots of bad weeds, there will need no composition, for in that they will thrive full as well as in any mixture which can be made for them, especially if the earth have lain in a heap for some time, and has been two or three times turned over, to break the clods, and make it fine: these sorts should not be planted in very rich earth, for although that would cause them to grow very luxuriantly, they will not flower so well as in a poorer soil. These plants must be frequently looked over during the winter, whilst they are in the green-house: all the decayed leaves should be carefully picked off, for if left on they will not only render the plants unsightly, but when they fall off will make a litter among the other plants; and if suffered to rot in the green-house, will occasion a foul, nasty, damp air, which will be very prejudicial to all the plants: hence, to avoid this, they should be constantly picked off every week, and during the summer season they will require to be picked every fortnight or three weeks; for as the branches advance, and new leaves are produced on the top, the under ones as constantly decay, and require to be removed.—The species of the two first divisions of this genus, are generally increased by parting their roots in August. Every tuber will grow, if it have a bud or eye to it. They may be planted in the same sort of earth as above directed; and if the pots be plunged into an old tan-bed, under a good frame in winter, the plants will thrive better than in a green-house: the glasses may be drawn off every day in mild weather, and if they are well covered in severe frosts, it is all the shelter they require; they should have little wet in winter, and therefore the glasses should be kept over them in heavy rains, or in mild weather raised only at the top.

2. Pelargonum Pinnatum; *Pinnated Crane's Bill.* Umbel subcompound; leaves pinnate; leaflets roundish, ovate, undivided, hirsute on both sides. Root thick, yellowish, descending, having few fibres; stem scarcely any, except the scapes, which have sometimes leaves, sometimes none; corolla papilionaceous, reddish white, with deeper-coloured veins. It flowers in April.—Native of the Cape.

3. Pelargonium Rapaceum; *Caraway-leaved Crane's Bill.* Leaves decompoundedly laciniate, villose. Root fleshy, two

inches thick and more, consisting of several irregular tubers, and frequently half a foot in width, within purple, on the outside covered with a brownish bark, and perennial; flowers scentless, appearing in April. This used formerly to be known in gardens by the name of Horsehead Geranium, in allusion to the remarkable shape of the flower: three of the petals cohere like the wings and keel of a papilionaceous flower, and are of a white or pale plush colour; the other two are reflexed, rose-coloured, and spotted, and look like a divided standard, of the same kind of blossom.—Native of the Cape.

** *Almost stemless: Root tuberous.*

4. Pelargonium Lobatum; *Vine-leaved Crane's Bill.* Stemless; umbel compound; leaves ternate or quinate, lobed, tomentose. Roots tuberous, from which come out three or four broad leaves, divided into several lobes, like a vine-leaf, spreading flat on the ground, crenated, on short footstalks; peduncles immediately from the root, about a foot high, naked, terminated by a bunch of dark purple flowers, having long tubes, sessile, and emitting a very agreeable odour in the evening, somewhat like the Bergamot pear. It flowers in July and August.—Native of the Cape.

5. Pelargonium Triste; *Night-smelling Crane's Bill.* Subcaulescent: umbel simple; leaves multifid, laciniate, villose; segments lanceolate. Root thick, roundish, tuberous, with several hairy leaves springing from it, which are finely divided almost like those of the Garden Carrot; they spread near the ground, and among them come out the stalks about a foot high, having two or three leaves of the same sort, but smaller, and sitting close; from the stalks arise two or three naked peduncles, terminated by a bunch of yellowish flowers, marked with dark purple spots, which smell very sweet after the sun has left them.—Native of the Cape.

6. Pelargonium Flavum; *Carrot-leaved Crane's Bill.* Subcaulescent: umbels simple; leaves decompoundedly laciniate, hirsute; segments linear. Root tuberous; stems several; corolla straw-white; petals wedge-shaped. It is a rough-haired plant. The two upper petals are ascending; the middle ones concave, converging, inclosing the fifth petal. It flowers from July to September.—Native of the Cape.

*** *Herbaceous,* or *suffruticose.*

7. Pelargonium Tabulare; *Rough-stalked Crane's Bill.* Peduncles few-flowered; leaves roundish, cordate, five-lobed, blunt; stems decumbent, hairy; corolla papilionaceous, yellow, twice as long as the calix, with the upper petals wider, reflex, emarginate, the rest linear. It flowers during the greater part of the summer.—Native of the Cape.

8. Pelargonium Alchemilloides; *Lady's-Mantle-leaved Crane's Bill.* Peduncles four-flowered or thereabouts; leaves orbiculate, palmate, gashed, very hairy. Stem herbaceous, decumbent; stigmas sessile. This sends out several herbaceous stalks, about a foot and half in length; flowers blush-colour, several together upon very long peduncles; there is a succession of them during all the summer months, and the seeds ripen about a month after the flowers are fallen. There is a variety of it with a dark circle in the middle of the leaves.—This, having herbaceous stalks, is best propagated by seeds: the cuttings indeed will take root, but the seedling plants are preferable. Where the seeds of this and many other sorts are permitted to scatter, there will be a supply of young plants in the spring following, provided the seeds are not buried too deep in the ground.

9. Pelargonium Odoratissimum; *Sweet-scented Crane's Bill.* Peduncles five-flowered or thereabouts; leaves roundish-cordate, very soft. This has a very short fleshy stalk, dividing near the ground into several heads; from these heads come out several slender stalks, nearly a foot in length, prostrate, with rounder leaves than those near the root, but of the same texture and odour. The flowers are produced from the side of these stalks, three, four, or five standing together upon slender peduncles; they are white, and being small, make little appearance. It flowers during most part of the summer. This species is known by the delicate softness of its leaves, and their highly aromatic and powerful smell, which is renewed by rubbing after the plant has been dried upwards of twenty years.—Native of the Cape. It may be propagated by seeds, or from heads slipped off from the short fleshy stalks; these heads should have their lower leaves stripped off, and then be planted single in a small pot; or if the heads are small, two or three may be put into one pot. Plunge them into a very moderate hot-bed, shade them, and refresh them gently with water; they will take root in a month or five weeks; then harden them gradually to the open air, where they may remain till autumn, when they must be removed into shelter for the winter.

10. Pelargonium Grossularioides; *Gooseberry-leaved Crane's Bill.* Peduncles subbiflorous, filiform; leaves cordate, roundish, gashed, toothed; stems very smooth. This is a biennial plant, sending out a great number of very slender trailing stalks, extending a foot and half in length; flowers on short slender peduncles, coming out at every joint from the side of the stalks; they are very small, and of a reddish colour, single, or sometimes two or three together. They continue in succession all the summer, and the seeds ripen in about five weeks after the flowers decay.—Native of the Cape. Sow the seeds on a moderate hot-bed, or on an open bed of light earth in the spring; the latter will require only to be kept clean from weeds, and to be thinned where they are too close: they will flower in July and August, and, if the autumn prove favourable, the seeds will ripen in September. Those which were raised on the hot-bed will come earlier to flower, and more certainly perfect seeds. Some of these plants, if put into pots, plunged into an old tan-bed under a frame, and treated as directed for the tuberous-rooted sorts, may be preserved during the winter.

11. Pelargonium Anceps; *Angular-stalked Crane's Bill.* Umbels many-flowered; flowers in a sort of head; leaves cordate, roundish, obsoletely lobed; stem three-sided, ancipital.—Native of the Cape.

12. Pelargonium Althæoides; *Althæa-leaved Crane's Bill.* Peduncles many-flowered; leaves cordate, ovate, sinuate, toothed, the uppermost pinnatifid. Plant depressed, wholly subtomentose; petals the length of the calix, dark purple on the outside, with a white edge, red within, the two upper ones with blood-red dotted streaks at the base; calices hirsute; beaks very short.—Native of the Cape.

13. Pelargonium Senecioides; *Small White-flowered Crane's Bill.* Peduncles three-flowered; involucres and calices blunt; leaves bipinnatifid, laciniate; stem herbaceous. Annual; flowering in July.—Native of the Cape.

14. Pelargonium Coriandrifolium; *Coriander-leaved Crane's Bill.* Peduncles subtriflorous; corollas subtetrapetalous; leaves bipinnate, linear; stem herbaceous, smoothish. This is an annual, or rather biennial plant, with branching stalks nearly a foot high. The flowers stand upon naked peduncles, which proceed from the side of the stalks, on the side opposite to the leaves. They are of a pale flesh-colour, appear in July, and the seeds ripen in September, soon after which the plants decay.—Native of the Cape. Being an annual plant, it is propagated by seeds sown on a gentle hot-bed in the spring. When the plants are strong enough to remove, plant each in a separate small pot, plunged into a moderate

hot-bed, shaded, and gradually hardened to the open air, into which they may be removed in June: when the plants have filled the pots with their roots, shake them out, preserving a ball of earth to the roots, and put them into pots a size larger: in these they will flower and ripen seeds, soon after which they will decay.

15. Pelargonium Myrrhifolium; *Myrrh-leaved Crane's Bill.* Peduncles subtriflorous; corollas subtetrapetalous; leaves bipinnatifid, the lower ones cordate-lobed. Stem somewhat strigose; root knobbed, tuberous, from which come out several pretty large leaves. The peduncles rise immediately from the root, and sometimes have one or two small leaves towards the bottom, where they often divide into two naked peduncles, each terminated by a bunch of pale-reddish flowers, which smell sweet at night. It flowers from May to August, and is somewhat shrubby.—Native of the Cape.

**** *Shrubby, with a fleshy thick Stem.*

16. Pelargonium Tenuifolium; *Fine-leaved Crane's Bill.* Umbels many-flowered; leaves decompoundedly pinnate, multifid, linear, hirsute; stem fleshy; flowering branches slender.—Native of the Cape.

17. Pelargonium Carnosum; *Fleshy-stalked Crane's Bill.* Umbels many-flowered; leaves pinnatifid, laciniate; petals linear; joints fleshy, gibbous. This has a thick fleshy knotty stalk, rising about two feet high, sending out a few slender fleshy branches, at the ends of which the flowers are produced in small clusters; the petals are narrow and white, making no great appearance; they continue in succession a great part of the summer.—This, with the nineteenth, twentieth, and thirty-fourth species, has more succulent stalks than the others; hence their cuttings should be planted in pots filled with light kitchen-garden earth, and plunged into a very moderate hot-bed, where they should be shaded from the sun in the heat of the day, and have but little water, for they are very apt to rot with much moisture. When well rooted, they may be separated, and planted in pots filled with the same sort of earth, placed in the shade till they have taken new root; then they may be removed into a sheltered situation, where they may remain till autumn. These four sorts should be sparingly watered, but especially in the winter, or when the air is damp, as they are liable to contract a mouldiness from the moisture, or in damp air: they will thrive much better in an airy glass-case than in a greenhouse, because in the former they will have more sun and air than in the latter.

18. Pelargonium Ceratophyllum; *Horn-leaved Crane's Bill.* Umbels many-flowered; leaves remotely pinnate, fleshy, round; segments channelled, obsoletely trifid. It flowers in May, and continues flowering during most of the summer months. The seeds ripen here.—Native of the south-west coast of Africa. It may be increased both by seeds and cuttings, but is found to be more tender than many other sorts, and more liable to be injured by damps.

19. Pelargonium Crithmifolium; *Samphire-leaved Crane's Bill.* Umbels many-flowered, panicled; leaves bipinnate, fleshy, dilated and jagged at the tips; petals obtuse, the upper ones crisped at the base. Root perennial; stem a foot or two in height, nearly erect, simple, swelled, round, glaucous, smooth, leafy, flowering at the top; flowers very numerous, inodorous, rather elegant than splendid; petals all of an equal length, white; the two upper ones crisped on each side at their base, and spotted with purple.—Native of the Cape. See the first and seventeenth species.

20. Pelargonium Gibbosum; *Gouty Crane's Bill.* Umbels many-flowered; leaves pinnate, pinnatifid, confluent at the tip; joints fleshy, gibbose. Stalk round, fleshy, with swelling knots at the joints, rising about three feet high, and sending out several irregular smooth branches; flowers four or five on a peduncle; petals dark purple, broader than in the seventeenth species, and having a very agreeable scent in the evening. It flowers most part of the summer.—Native of the Cape. See the seventeenth species.

21. Pelargonium Fulgidum; *Celandine-leaved Crane's Bill.* Umbel twin; leaves three-parted, pinnatifid-gashed; middle segment very large. This has a fleshy stalk, which seldom rises a foot high, and puts out a very few branches; peduncles short, having at the top two or three flowers with unequal petals, of a deep scarlet colour. It flowers during most part of the summer.—Native of the Cape.

22. Pelargonium Quercifolium; *Great Oak-leaved Crane's Bill.* Umbels submultiflorous; leaves cordate, pinnatifid, crenate; sinuses rounded; filamenta ascending at the tip. Stem shrubby, twisted, branched, more than four feet high. There are two varieties, larger and smaller. It flowers from March to August.—Native of the Cape.

23. Pelargonium Radula; *Multifid-leaved Crane's Bill.* Umbels few-flowered; leaves pinnatifid, laciniate, rugged, revolute; segments linear. Stem shrubby, covered with an ash-coloured bark, branched, two feet high; corolla papilionaceous, rose-coloured, with red lines; the claws white; the two upper petals reflex and wider. The whole plant has a strong smell of turpentine. It takes the name *Radula,* from the rough rasp-like surface of its leaves. There are two varieties, a larger and a smaller; indeed, as it is readily raised from seeds, it affords many seminal varieties. It may also be increased by cuttings.—Native of the Cape.

24. Pelargonium Graveolens; *Strong-scented Crane's Bill.* Umbels many-flowered, subcapitate; leaves palmate, seven-lobed; segments oblong, blunt, revolute at the edge. Stem arborescent, a fathom in height, branched, the tender branches pubescent; corolla papilionaceous, pale purple, with deeper lines on the upper petals, which are wider and reflex. This plant has a strong smell, which varies, and resembles turpentine, lemon, or roses. It flowers from March to July.—Native of the Cape.

25. Pelargonium Papilionaceum; *Butterfly Crane's Bill.* Umbels many-flowered; leaves roundish, cordate, angular; corollas papilionaceous; wings and keel minute. This rises with an upright shrubby stalk seven or eight feet high, sending out several side-branches, with large, angular, rough leaves, on short footstalks. The flowers are produced in large panicles at the end of the branches; the two upper petals, which are pretty large, turn upwards, and are finely variegated; but the three under ones are very small, and being bent back are screened from the sight, unless the flower be viewed near. It flowers from April to July.—Native of the Cape.

26. Pelargonium Inquinans; *Scarlet-flowered Crane's Bill.* Umbels many-flowered; leaves orbiculate-reniform, scarcely divided, crenate, tomentose, and clammy. This rises with a soft shrubby stem to the height of eight or ten feet, sending out several branches, which are generally erect; flowers in loose bunches, on long, stiff, axillary peduncles; corolla bright scarlet. The flowers make a fine appearance, and there is a succession of them during all the summer months. The leaves, when bruised, stain the fingers of a ferruginous colour; hence Linnæus's trivial name. There are several varieties, differing in the colour and splendour of their flowers.—Native of the Cape. This species was, according to Martyn, first brought into England about the year 1718: it soon became common, and is justly admired for the vivid scarlet of its copious flowers.

27. Pelargonium Hybridum; *Bastard Crane's Bill.* Umbels many-flowered; leaves obovate, crenate, smooth, fleshy; petals linear. Stem smooth; leaves like those of the 50th species, but broader, obscurely lobed, and somewhat downy; flowers of a scarlet red, with longer petals than those of the preceding. In the flower this species greatly resembles the preceding, but the herb is smaller.—Native of the Cape.

28. Pelargonium Zonale; *Common Horse-shoe Crane's Bill.* Umbels many-flowered; leaves cordate, orbiculate, scarcely lobed, toothed, marked with a concentric zone. This rises with a shrubby stalk, four or five feet high, and divides into a great number of irregular branches, so as to form a large bush, frequently eight or ten feet in height; the flowers are produced in pretty close bunches, on axillary peduncles five or six inches in length, coming out towards the ends of the branches; they are of a reddish purple or rose colour, are very showy, and continue in succession during the greatest part of the summer. There is a variety with fine variegated leaves, and the flowers vary much in colour, from purple, through the different shades of red, up to high scarlet.—Native of the Cape.

29. Pelargonium Heterogamum; *Red-flowered Crane's Bill.* Umbels many-flowered; leaves suborbiculate, gash-lobed, toothed; stem erect, shrubby.—Native of the Cape.

30. Pelargonium Monstrum; *Cluster-leaved Crane's Bill.* Leaves orbiculate, reniform, obsoletely lobed, complicated, curled.—Native of the Cape.

31. Pelargonium Bicolor; *Two-coloured Crane's Bill.* Umbels many-flowered; leaves ternatifid, lobed, toothed, waved, villose. Stem shrubby, twisted, covered with an ash-coloured bark; branches round, villose, subherbaceous, a foot long; corolla almost regular, papilionaceous, wheel-shaped; petals deep crimson, with a white edge. Jacquin observes, that the whole plant has very a strong smell; and Curtis adds, that it obviously differs from all the other species in the particular shape of its leaves, and the colour of the flowers, which are usually of a rich and very dark purple, edged with white: they appear from June to August. It is not disposed to ripen its seeds, neither can it be very readily increased by cuttings.—Native of the Cape.

32. Pelargonium Vitifolium; *Balm-scented Crane's Bill.* Flowers in heads; leaves cordate, three-lobed, somewhat rugged; stems upright, seven or eight feet high. The flowers grow in compact clusters, on the top of long, naked, axillary peduncles, rising much higher than the branches; being small, and of a pale blue colour, they make no great figure, but there is a succession of them during most part of the summer.—Native of the Cape.

33. Pelargonium Capitatum; *Rose-scented Crane's Bill.* Flowers in heads; leaves cordate, lobed, waved, soft. Stems diffused, four or five feet high. The flowers grow in close roundish heads, forming a sort of corymb; they are of a purplish blue colour, with dark veins, and continue in succession great part of the summer: the leaves, when rubbed, have an odour like dried Roses.—Native of the Cape.

34. Pelargonium Glutinosum; *Clammy Crane's Bill.* Umbels few-flowered; leaves cordate, hastate, quinquangular, clammy; stem shrubby, covered with a gray bark, three feet high and more; branches declining and decumbent, green and clammy, as is the whole of the plant; corolla much larger than the calix, papilionaceous, pale purple, variegated with red streaks; the two upper petals wider, reflex; the middle of the leaf is generally stained with purple. Several varieties have been produced from seed, from which it is sometimes propagated; it is also readily increased by cuttings.—Native of the Cape. See the seventeenth species.

35. Pelargonium Cucullatum; *Hooded Crane's Bill.* Umbels submultiflorous; leaves kidney-form, cowled, slightly scolloped, and finely toothed. This rises with a shrubby stalk, eight or ten feet high, sending out several irregular branches; the petals are large, entire, and of a blue purple colour; the seeds have short hairy beaks. It flowers from June to September. This is a large and showy species, remarkable for its grayish hoary aspect, rounded, funnel-like leaves, and copious hairy umbels of large purple flowers, the upper petals finely pencilled, and marked with a dark central spot.—Native of the Cape.

36. Pelargonium Angulosum; *Marshmallow-leaved Crane's Bill.* Umbels many-flowered; leaves rounded, cowled, angular, toothed. This bears much resemblance to the preceding, and has been confounded with it; but the leaves are of a thicker substance, divided into many acute angles, having purple edges, which are acutely indented; the stalks and leaves are very hairy; the branches are not so irregular as those of the former, nor are the bunches of flowers near so large. It flowers in July and August.—Native of the Cape.

37. Pelargonium Acerifolium; *Maple-leaved Crane's Bill.* Umbels five-flowered, or thereabouts; leaves palmate, five-lobed, serrate, wedge-shaped at bottom, undivided. It flowers in April and May.—Native of the Cape.

38. Pelargonium Cordatum; *Heart-leaved Crane's Bill.* Umbels many-flowered; leaves cordate, acute, toothed; lower petals linear, acute. Stem shrubby, branched; flowers at the ends of the stem and branches; corolla papilionaceous, large pale purple. There are several varieties of this species which strike readily from cuttings.—Native of the Cape.

39. Pelargonium Echinatum; *Prickly-stalked Crane's Bill.* Stem fleshy; stipules permanent, spinescent; leaves cordate, roundish, from three to five lobed, densely downy beneath; flowers umbelled; umbels seven or eight flowered. This plant somewhat resembles the preceding in its habit. The three lowermost petals of the flower are pure white, with a little gibbosity at the base of each; the two uppermost are marked with three irregular spots, of a rich purple colour, inclining to carmine; the two lower spots narrowest, and of the deepest colour. It varies with petals of a rich purple colour, in which the spots are similar, but not so conspicuous. It produces its seed in favourable seasons, but is generally propagated by cuttings. This plant is not very common; but deserves attention from its singularity, and being ornamental.—Native of the Cape.

40. Pelargonium Tetragonum; *Square-stalked Crane's Bill.* Peduncles two-flowered; branches four-cornered, fleshy; corollas four-petalled. Stem angular; angles four, sometimes three, succulent, as is the whole plant; corolla very handsome, papilionaceous; the two upper petals an inch and half in diameter, semitubular at the base, upright, reflex at the tip, purple on the outside, white within, having two oblong feathered spots, of a deep purple colour. A degree of singularity runs through the whole of this plant; its stalks are unequally and obtusely quadrangular, sometimes more evidently triangular; its leaves few, and remarkably small; its flowers on the contrary are uncommonly large, and, which is most extraordinary, have only four petals; previous to their expansion, the body of filamenta is bent so as to form a kind of bow. There is a variety with beautifully coloured leaves. It flowers from June to August.—It is easily propagated by cuttings.

41. Pelargonium Peltatum; *Peltated Crane's Bill.* Umbels few-flowered; leaves five-lobed, quite entire, fleshy, peltated; branches angular. This has many weak fleshy stalks, which require support, and extend to the length of two or three feet; the flowers are on pretty long axillary

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peduncles, each sustaining four or five, of a purple colour, coming out in succession, during most of the summer months. The seeds frequently ripen here.—Native of the Cape.

42. Pelargonium Lateripes; *Ivy-leaved Crane's Bill.* Umbels many-flowered; leaves cordate, five-lobed, somewhat toothed, fleshy; branches round. It flowers during the greatest part of the summer.—Native of the Cape.

43. Pelargonium Cortusæfolium; *Cortusa-leaved Crane's Bill.* Umbels many-flowered; leaves cordate, gash-lobed, waved, bluntly toothed; stipules awl-shaped. Stem shrubby, woody, branched, almost upright, round, the thickness of a finger, three feet high and more, brown; flowers handsome; the two upper petals large, widely wedge-shaped, purple, with several branched streaks of a darker purple arising from the base, and above these a transverse band, of the same colour.—Native of the Cape.

44. Pelargonium Crassicaule; *Thick-stalked Crane's Bill.* Umbels many-flowered; leaves kidney-form, obacuminate; stem fleshy, branched, even. It flowers in July.—Native of the south-west coast of Africa.

45. Pelargonium Cotyledonis; *Hollyhock-leaved Crane's Bill.* Umbels compound; leaves cordate, peltate, wrinkled; stem fleshy. It flowers from May to July.—Native of the island of St. Helena.

***** *Shrubby, with a woody Stem.*

46. Pelargonium Ovale; *Oval-leaved Crane's Bill.* Umbels few-flowered; pedicels elongated; leaves elliptic, toothed; stems hirsute; root-leaves numerous; corolla papilionaceous, twice as large as the calix, red; the upper petals longer, wider, reflex. It flowers from May to July.—Native of the Cape.

47. Pelargonium Betulinum; *Birch-leaved Crane's Bill.* Umbels few-flowered; leaves ovate, unequally serrate, levigated. Stem shrubby, four or five feet high, sending out several branches; corolla large, red, with the two upper petals bigger than the three others. The flowers vary considerably both in size and colour, generally pale pink; its foliage is different from that of the other species, and, as its name imports, like that of the Birch Tree. It flowers during most part of the summer, and is readily propagated by cuttings.—Native of the Cape.

48. Pelargonium Glaucum; *Spear-leaved Crane's Bill.* Peduncles two-flowered; leaves lanceolate, quite entire, acuminate, glaucous. Stem shrubby, with round, rod like, declining branches, two feet high; corolla papilionaceous, white; the upper petals wider, reflex; claws purple. It flowers from June to August. It rarely ripens its seed with us, and is therefore usually raised from cuttings, which are not very free in striking.—Native of the Cape.

49. Pelargonium Tricuspidatum; *Three-pointed Crane's Bill.* Peduncles two-flowered; leaves three-pointed; middle lobe more produced, subserrate; midrib muricated underneath; root branched. Stem shrubby, two feet high and more, very much branched, smooth, round, the thickness of a reed or the little finger, almost upright, when old dusky, when young more or less blood-red. It flowers from May to August.

50. Pelargonium Acetosum; *Sorrel Crane's Bill.* Umbels few-flowered; leaves obovate, crenate, smooth, fleshy; petals linear. Stem shrubby, six or seven feet high, sending out several side-branches; peduncles axillary, long, sustaining three or four flowers, with narrow unequal petals, of a pale blush-colour, with some stripes of a light red. A variety with scarlet flowers has been raised from seed. The flowers continue in succession during most part of the summer.—Native of the Cape.

51. Pelargonium Scabrum; *Rough-leaved Crane's Bill.* Umbels few-flowered; leaves wedge-shaped, semitrifid, rugged; lobes lanceolate, loosely serrate. Stem shrubby, round, three or four feet high, the thickness of a finger, upright, of a reddish bay colour, branching from the axils, very rough, as is the whole plant, but becoming smooth by age; petals blunt, of a purple rose-colour, the two upper twice as wide as the others, with a dark red spot at the base. It flowers from August to November.—Native of the Cape.

52. Pelargonium Crispum; *Curled-leaved Crane's Bill.* Peduncles subtriflorous; leaves distich, cordate, three-lobed, curled, muricated; stipules heart-shaped; nectary the length of the calix. This is a pretty species, and valued more particularly for its lemon-scent. There are two varieties, one with leaves half an inch in diameter, the other above an inch. It flowers from July to November.—Native of the Cape.

53. Pelargonium Adulterinum; *Hoary Trifid-leaved Crane's Bill.* Peduncles subbiflorous; leaves cordate, three-lobed, waved, villose, soft. It flowers in April and May.—Native of the Cape.

54. Pelargonium Extipulatum; *Soft-leaved Trifid Crane's Bill.* Umbels few-flowered; leaves cordate, three-parted, lobed, toothed, hoary; stipules scarcely any. The whole plant is very smooth, and somewhat glaucous; stem shrubby, a foot high, with round upright branches; corolla papilionaceous, pale flesh-colour, the three lower petals hanging down, without spots, and white on the outside; the two others upright, bent back at top, having spots of a darker colour. The leaves have a very pleasant smell, not unlike Sweet Marjoram. It flowers from May to August.—Native of the Cape.

55. Pelargonium Ternatum; *Ternate Crane's Bill.* Stem shrubby, hispid; leaves opposite, ternate; leaflets wedge-shaped, gash-trifid, serrate, scabrous. Stem suffruticose, dichotomous, round, purple, villose, erect, two feet high and more; branches simple, short, resembling the stem; flowers lateral and terminating, umbelled; corolla whitish flesh-colour; petals oblong, entire, equal, with a double purple streak at the base. This differs very materially from the other species, in the unusual roughness of the stalks, as well as in its whole habit. It is easily raised from cuttings.—Native of the Cape.

56. Pelargonium Tricolor; *Three-coloured Crane's Bill.* Umbels three-flowered: leaves oblong, bluntish, hoary, cut and somewhat pinnatifid, obscurely three-lobed: the two upper petals rugged at the base, with prominent shining dots. This scarcely exceeds a foot high in this country, growing up with a shrubby stem, and spreading widely into numerous flowering branches, so much disposed to produce flowers in constant succession, that during most of the summer the plant is loaded with a profusion of them. They generally go off without seed; and when any is produced, there is generally one perfect and four abortive. The whole plant is covered with short white hairs, which give to the foliage a somewhat silvery hue. The two uppermost petals are of a beautiful red, having their bases nearly black; the three lowermost are white. Instances occur in which one or more of the white petals have a stripe of red; and the dark colour at the base of the upper petals is in a certain degree soluble in water; for on the plants being watered, the white petals here and there become stained by the colouring matter, which in a diluted state is purplish: as the flowers decay, this apparently black part, distinguished by the roughness of its surface, arising from prominent lucid points, is sometimes perforated with numerous small holes.—Native of the Cape. Most of the branches in this species, running out speedily

into flowering stalks, form few proper for cuttings, which are struck with difficulty, and perfect seeds are but sparingly produced.

57. Pelargonium Carneum; *Flesh-coloured Crane's Bill.* Stemless: root rapaceous, simple, oblong, brown, two inches long, perennial; leaves bipinnate; pinnules gashed, smoothish; five filamenta fertile. It flowers in March and April.—Native of the Cape.

58. Pelargonium Barbatum; *Bearded Crane's Bill.* Stemless: root rapaceous, simple; leaves pinnate; pinnas pinnatifid, lanceolate, linear, acute, bearded at the tip; five filamenta fertile; petals linear-wedge-shaped, blunt, half turned back, very pale rose colour; the two upper ones approximating, twice as broad as the rest, sometimes emarginate, and marked below with two red lines; the three lower ones have only one line. The umbels and their stalks are downy. It flowers in April.—Native of the Cape.

59. Pelargonium Melananthon; *Dark-flowered Crane's Bill.* Stemless: root rapaceous, simple; leaves pinnate, somewhat hispid; pinnas lobe-gashed, blunt; five filamenta fertile; petal wedge-linear, blunt, upright, and white to the middle, reflex, and very dark purple above. It has but very little smell when bruised; and flowers in April and May.—Native of the Cape.

60. Pelargonium Triphyllum; *Three-leaved Crane's Bill.* Stemless: root rapaceous, simple; leaves ternate crenate, smooth; five filamenta fertile; petals wedge-shaped, blunt, upright at bottom, and thence spreading very wide, rose-coloured, a little longer than the calix; the two upper ones almost twice as wide as the others, a little longer, with blood-red dots below; style and stigma of a very dark blood-red colour. It flowers in April.—Native of the Cape.

61. Pelargonium Heterophyllum; *Various-leaved Crane's Bill.* Stemless: root rapaceous, simple; leaves ternate and entire, smooth, ciliate; leaflets often lobed; five filamenta fertile; petals wedge-shaped, springing from a long upright claw, turned back at top, blunt, twice as long as the calix, white; the two upper ones a little wider, with a long dark blood-red spot above the claws. When bruised it has the smell of turpentine, and flowers in March and April.—Native of the Cape.

62. Pelargonium Nervifolium; *Nerve-leaved Crane's Bill.* Stemless: root rapaceous, simple; leaves ternate, three-lobed, and entire, many-nerved, smooth, prickly, ciliate at the edge; five filamenta fertile; petals twice as long as the calix, wedge-shaped, very blunt, reflex, and spreading very much, white; the two upper ones wider, with two branching red stripes arising from the base. It has a slight smell of turpentine when bruised. It flowers in March and April.—Native of the Cape.

63. Pelargonium Longifolium; *Long-leaved Crane's Bill.* Stemless: root rapaceous, simple; leaves lanceolate, acute, smooth, the older ones often pinnate; four filamenta fertile; petals wedge-shaped, blunt, half reflex, uniformly red purple; the two upper ones a little wider. The flower-stalk is solitary, three or four inches high, bearing about three unequal, downy, partial stalks, accompanied by a leaf or two, each terminating in a downy umbel of several rose-coloured flowers. It flowers in March and April.—Native of the Cape.

64. Pelargonium Ciliatum: *Ciliated Crane's Bill.* Stemless: root rapaceous, subsimple; leaves lanceolate, acute at both ends, ciliate, smooth underneath, hairy above, often appendicled; five filamenta fertile; petals linear, cuneiform, bluntish, erect at bottom, but spreading very much at top, twice as long as the calix, pale yellow; the three lower unspotted; the two upper, above the claw to the middle of the border, dark blood-red. It flowers in May.—Native of the Cape.

65. Pelargonium Depressum; *Flat-umbelled Crane's Bill.* Stemless: root rapaceous, simple; leaves narrow, lanceolate, acute, smooth; umbels finally depressed, smooth; four filamenta fertile; peduncles about eight, an inch long, somewhat villose, channelled, forming at first a convex umbel, but afterwards spreading out so much that the umbel is flat and depressed. It flowers in March and April.—Native of the Cape.

66. Pelargonium Longiflorum; *Long-flowered Crane's Bill.* Stemless: root rapaceous, simple; leaves lanceolate, acute, smoothish; four filamenta fertile; petals very long, linear, sharpish, channelled, erect at bottom, but spreading very much above, an inch and half long, very pale yellow, with a longitudinal purple band above the claw, of a very deep colour in the uppermost ones. The uppermost petal is sometimes so deeply cloven, that the corolla appears to be six-petalled.—Native of the Cape.

67. Pelargonium Chamædryfolium; *Germander-leaved Crane's Bill.* Peduncles one or two flowered. Stems herbaceous, decumbent; leaves oblong, blunt, serrate, villose; five filamenta fertile; root branching, annual. The whole plant villose, and smelling rather disagreeably. Petals the length of the calix, wedge-shaped, blunt, upright, spreading a little at top, white with a dark purple disk, the two uppermost twice as broad as the other three; antheræ yellow; germen hirsute.—Native place uncertain.

68. Pelargonium Trichostemon; *Hairy-stamined Crane's Bill.* Peduncles few-flowered; leaves roundish, ovate, bluntly serrate, velvety. Stem biennial, almost erect; filamenta hirsute, five fertile; root branched, biennial; petals very blunt, uniformly red purple, spreading very much above the claws, the two upper ones very wide, and roundish, the other three oblong. It flowers in March, and the following months.

69. Pelargonium Coronopifolium; *Buck's-horn Plantain-leaved Crane's Bill.* Peduncles two-flowered; leaves lanceolate, linear, toothserrate, smooth above, somewhat rough-haired underneath. Root branching, the thickness of a reed, brown, long; stems few, procumbent, half a foot high, round, perennial, more slender by half than a reed; petals blunt, spreading very much, white at the claws, the rest purple; the two upper ones very wide, obovate, with the claw on each side produced and wedge-shaped; the three lower from a narrow claw oblong. The little smell it has is unpleasant. It flowers in June and July. There is a variety with smaller flowers, with the claw of the two upper petals white, and crowned with a deep-red band.

70. Pelargonium Bullatum; *Bladder-leaved Crane's Bill.* Peduncles two-flowered; corollas four-petalled. Stem biennial; leaves ternate, pinnatifidly lobed, somewhat hispid on both sides; five filamenta fertile; root branched; petals always four, very pale purple or flesh-colour, twice as long as the calix; antheræ scarlet; stigma blood-red; fruit hirsute, two inches long. It flowers in the summer, and when rubbed has an unpleasant smell.

71. Pelargonium Betonicum; *Betony-leaved Crane's Bill.* Peduncles few-flowered; corollas four-petalled. Stem biennial; leaves pinnatifid, lobed, somewhat rough-haired; five filamenta fertile; root brown, round, the thickness of a reed, biennial; petals wedge-shaped, blunt, spreading, flesh-coloured or white, twice as long as the calix; the two upper ones much larger, and having two branching red lines. It flowers in summer, has but little smell, and is rough-haired all over.

72. Pelargonium Lacerum; *Jagged-leaved Crane's Bill.* Peduncles five-flowered; corollas five-petalled. Stem biennial, hairy; leaves pinnate, lobed, gashed; five filamenta fertile; root branched; petals blunt, spreading, pale flesh-colour; the two uppermost obovate, very wide, with two branching blood streaks above the claw; the three lower ones much shorter and narrower, almost spatulate; fruit rough-haired; smell unpleasant. It flowers from May to July.

73. Pelargonium Longicaule; *Long-stalked Crane's Bill.* Peduncles from one to five flowered; corollas four-petalled, seldom five-petalled. Stem biennial, hirsute; leaves pinnate, lobed; seven filamenta fertile; root branched. It resembles the preceding very much; but it very seldom has five petals, and has always seven fertile filamenta. It flowers from May to July, and has an unpleasant smell.

74. Pelargonium Multicaule; *Many-stalked Crane's Bill.* Peduncles five-flowered, or thereabouts; corollas four-petalled. Stem biennial, smooth; leaves pinnate-lobed, smooth; seven filamenta fertile; root the thickness of a reed, or rather more, about three inches long, round, branched, pale; petals spreading, deep purple, with deeper purple bands above the claw; the two upper spatulate, subemarginate, almost twice as long as the calix; the two lower blunt, less than half the breadth, and much shorter than the others. It flowers in April and the following months, and is void of smell.

75. Pelargonium Anemonæfolium; *Anemone-leaved Crane's Bill.* Peduncles four or five flowered; corollas five-petalled. Stem biennial; leaves pinnate, lobed, somewhat rough-haired underneath, smooth above; seven filamenta fertile; root round, the thickness of a reed, brownish; petals wedge-shaped, rose-coloured, twice as long as the calix, blunt, spreading; the two upper ones much wider, and marked with branched blood-red lines. It flowers in the summer, and when bruised has an unpleasant balsamic smell.

76. Pelargonium Hirtum; *Rough-haired Crane's Bill.* Umbels five-flowered, or thereabouts; leaves tripinnate, hirsute; pinnules linear. Stem fleshy; root round, the thickness of the little finger, half a foot long; peduncles hirsute, roughish, spreading, three or four inches long, sustaining from three to five flowers in an umbel; petals spatulate, blunt, spreading, red purple; the two upper ones nearly twice as wide as the others, and of a deeper colour; stigma blood-red. It flowers in March and April, has but little smell, and that is unpleasant.

77. Pelargonium Tomentosum; *Downy Crane's Bill.* Umbels many-flowered, simple and compound; leaves cordate, mostly five-lobed, serrate, tomentose, very soft. Stem fleshy; root branched; peduncles terminating, solitary, in pairs or threes, about three inches in length, the thickness at most of a pigeon's quill, almost erect, or spreading a little; petals oblong, blunt, a little longer than the calix, white with a little longitudinal red band at the claw; the two upper ones spreading very much, and three times as wide as the three lower ones, which are extended downwards. It flowers in April and the following months.

78. Pelargonium Ribifolium; *Currant-leaved Crane's Bill.* Umbels many-flowered; depressed, somewhat halved; leaves cordate, three-lobed, serrate, somewhat hirsute; lobes lobed, gashed. Stem fleshy; root branched; petals blunt, snow-white, without any spot; the two upper ones longer, three times as wide as the others, wedge-shaped, emarginate, half turned back; the three lower ones sublinear, quite entire, stretched forwards. It flowers from July to August, and has a strong smell.

79. Pelargonium Fuscatum. Umbels four-flowered; leaves cordate, roundish, mostly five-lobed, acutely serrate, smooth-ish; stipules ovate. Stem shrubby, erect, when young rugged; peduncles axillary, alternate, erect, somewhat rugged; the lower often opposite to a leaf: petals blunt, spreading; the three lower oblong, shorter, pale rose-colour; the two upper wedge-shaped, three times as wide as the lower ones, twice as long as the calix, all over dark red, with longitudinal bands of a much darker red. The leaves have scarcely any smell; and the flowers rather a disagreeable scent. They appear in the summer.

80. Pelargonium Patulum. Peduncles two-flowered; leaves somewhat kidney-shaped, lobe-gashed, acutely crenate, smooth above. Stem shrubby; six filamenta fertile. The stems arise from a branched root: petals wedge-shaped, blunt, pale rose-colour, spreading; the two upper ones emarginate, almost twice as wide as the three others, and having a red band below the middle. It flowers in summer, and has little scent.

81. Pelargonium Balsameum. Umbels few-flowered; leaves five-parted, somewhat rough-haired; lobes lanceolate, acute, gashed, somewhat rigid. Stem shrubby; peduncles axillary, round, somewhat rough-haired, sustaining from one to three flowers: petals flesh-coloured, spreading very much; the two upper ones obovate, emarginate, or quite entire, twice as wide as the three lower, which are oblong, narrow, blunt, quite entire; stigma blood-red. It flowers in summer, and has a balsamic scent like that of Tacamahaca.

82. Pelargonium Hermannifolium. Peduncles two-flowered; leaves cuneate, roundish, gashed, rough-haired, rigid, distich; stem shrubby; petals white, or tinged with flesh-colour, twice as long as the calix. It is easily distinguished from the fifty-second species by having no smell, or at most only a very slight smell of turpentine when bruised. The leaves are larger, and it is also a higher plant.

Pellitory, Bastard. See *Achillea.*

Pellitory of Spain. See *Anthemis.*

Pellitory of the Wall. } See *Parietaria.*
Pellitory, Common. }

Peltaria; a genus of the class Tetradynamia, order Siliculosa.—Generic Character. *Calix:* perianth four-leaved; leaflets ovate, concave, erect, coloured, deciduous. *Corolla:* four-petalled, cruciform; petals obovate, entire, flat, with claws shorter than the calix. *Stamina:* filamenta six, awl-shaped, the two opposite ones shortest, the length of the calix; antheræ simple. *Pistil:* germen roundish, compressed; style short; stigma simple, blunt. *Pericarp:* silicle entire, suborbiculate, compressed, flat, one-celled, not opening. *Seed:* single, (one to three, according to Gærtner,) roundish, compressed, flat, emarginate. Essential Character. *Silicle:* entire, suborbiculate, compressed, flat, not opening.——The species are,

1. Peltaria Alliacea; *Garlic-scented Peltaria.* Leaves embracing, oblong, undivided; stalk upright, branching, about two feet high. White flowers terminate the stalk in the form of umbels.—It flowers in May; and is a native of stony mountainous places in Austria. It is easily propagated by seeds, which ripen in July, and may be sown in small patches in the borders of the flower-garden, at the beginning of April. When the plants are come up, leave four or five in each patch, pulling the others out to give these room to grow, and keeping them free from weeds.

2. Peltaria Capensis; *Cape Peltaria.* Stem-leaves quinate-pinnate, linear, somewhat fleshy; petals white, subemarginate, four times as big as the calix, spreading, sessile.—Native of the Cape.

Penæa; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth two-leaved;

leaflets opposite, lanceolate, concave, equal, coloured, shorter by half than the corolla, loose, deciduous. *Corolla:* one-petalled, bell-shaped; border four-cleft, spreading a little, much shorter than the tube; segments sharp. *Stamina:* filamenta four, awl-shaped, extremely short, placed on the tube of the corolla between the divisions of it, upright, naked; antheræ upright, flattish, emarginate both ways. *Pistil:* germen ovate, four-cornered; style four-cornered, by four membranaceous longitudinal wings; stigma cruciform, blunt, permanent. *Pericarp:* capsule four-cornered, furnished with the style, four-celled, four-valved. *Seeds:* in pairs, somewhat oblong, blunt. ESSENTIAL CHARACTER. *Calix:* two-leaved. *Corolla:* bell-shaped. *Style:* quadrangular. *Capsule:* four-cornered, four-celled, eight-seeded.—The plants of this genus are shrubs, rugged below, with the vestiges of fallen leaves; leafy above; flowers terminal or axillary, solitary or aggregate, red, white, or yellow. They have been little examined, except in dried specimens.——The species are,

1. Penæa Sarcocolla; *Ovate-leaved Penæa.* Leaves ovate, flat; calices ciliate, larger than the leaf; corollas blunt. An humble, branched, and bushy shrub.—Native of the Cape.

2. Penæa Mucronata; *Heart-leaved Penæa.* Flowers terminating; leaves acuminate, smooth; style four-cornered. —Native of the Cape.

3. Penæa Marginata; *Margined Penæa.* Leaves cordate, margined; flowers lateral. This is a stiff shrub, with the branches commonly in threes.—Native of the Cape.

4. Penæa Lateriflora; *Side-flowering Penæa.* Leaves ovate; flowers lateral, sessile; stems red, with elongated branches.—Native of the Cape.

5. Penæa Tomentosa; *Downy-leaved Penæa.* Leaves ovate, tomentose; flowers lateral.—Native of the Cape.

6. Penæa Fucata; *Painted Penæa.* Leaves rhomb-ovate; bractes wedge-shaped, acute, coloured; flowers purple. —Native of the Cape.

7. Penæa Squamosa; *Scaly Penæa.* Leaves rhomb-wedge-shaped, fleshy; corollas rather large, white, or yellowish.— —Native of the Cape.

8. Penæa Fruticulosa; *Shrubby Penæa.* Leaves somewhat oblong, blunt; bractes orbiculate, acute. This is a small shrub, with round branches, at the end of which are the flowers.—Native of the Cape.

9. Penæa Myrtoides; *Myrtle-leaved Penæa.* Leaves lanceolate: branches upright, round, red; flowers terminating, subsolitary.—Native of the Cape.

Pennantia; a genus of the class Polygamia, order Diœcia. —GENERIC CHARACTER. *Hermaphrodite Flower. Calix:* none. *Corolla:* petals five, lanceolate, acute, spreading very much. *Stamina:* filamenta five, capillary, the length of the petals; antheræ oblong, incumbent. *Pistil:* germen superior, bluntly three-cornered; style none; stigma flat, peltated, subtrilobate. *Pericarp:* three-sided, two-celled. *Seed:* solitary, subtriquetrous. *Male Flower. Calix* and *Corolla:* as above. *Stamina:* filamenta five, capillary, twice as long as the petals; antheræ ovate, incumbent. ESSENTIAL CHARACTER. *Calix:* none. *Corolla:* five-petalled. *Stamina:* five. *Pericarp:* three-sided, two-celled, with solitary subtriquetrous seeds.——The only known species is,

1. Pennantia Corymbosa. A tree or shrub, with round leafy branches, dotted, and somewhat downy when young. —Native of New Zealand.

Penny Grass. See *Rhinanthus.*

Pennyroyal. See *Mentha Pulegium.*

Pennywort, Marsh and *Water.* See *Hydrocotyle.*

Pentapetes; a genus of the class Monadelphia, order Dodecandria.—GENERIC CHARACTER. *Calix:* perianth double; outer three-leaved, one-sided, caducous; leaflets linear, acuminate; inner one-leafed, five-parted, permanent; segments lanceolate, acuminate, spreading, longer than the corolla. *Corolla:* petals five, roundish, spreading, fastened to the pitcher of the stamina. *Stamina:* filamenta fifteen, filiform, upright, shorter than the corolla, united into a pentagon pitcher, but free above; antheræ sagittate, upright; ligules five, linear, lanceolate, petal-shaped, upright, each between every three stamina, springing from the pitcher. *Pistil:* germen ovate; style filiform, thickened above, striated, longer than the stamina, permanent; stigma obsoletely five-toothed. *Pericarp:* capsule membranaceous, subglobular, acuminate, five-celled, five-valved; partitions contrary. *Seeds:* eight, ovate, acute, four on each side, fastened withinside to the partition. ESSENTIAL CHARACTER. *Calix:* double; outer three-leaved; inner five-parted. *Stamina:* fifteen, with five ligules, petal-shaped. *Capsule:* five-celled, many-seeded. ——The only known species is,

1. Pentapetes Phœnicea; *Scarlet-flowered Pentapetes.* Leaves hastate, lanceolate, serrate. Stalk upright, two or three feet high, sending out side-branches the whole length; those from the lower part of the stalks are the longest, the others gradually diminish so as to form a sort of pyramid. Flower monopetalous, cut into five obtuse segments almost to the bottom; of a fine scarlet colour, appearing in July, and ripening into seed in autumn.—Native of India, Japan, China, and Cochin-china. The seeds must be sown upon a good hot-bed early in March, and when the plants are fit to remove, there should be a new hot-bed prepared to receive them, into which should be plunged some small pots, filled with good kitchen-garden earth; in each of these one plant should be placed, giving them a little water to settle the earth to their roots; they must also be shaded from the sun till they have taken new root; then they should be treated in the same way as other tender exotic plants, admitting the free air to them every day in proportion to the warmth of the season, and covering the glasses with mats every evening to keep them warm. When the plants are advanced in their growth so as to fill the pots with their roots, they should be shifted into larger pots, filled with the same sort of earth as before, and plunged into another hot-bed, where they may remain as long as they can stand under the glasses of the beds without being injured; and afterwards they must be removed either into a stove or a glass-case, where they may be screened from the cold, and in warm weather have plenty of fresh air admitted to them. With this management the plants will begin to flower early in July, and there will be a succession of flowers continued to the end of September, during which time they will make a good appearance. The seeds ripen gradually after each other in the same succession as the flowers were produced, so that they should be gathered as soon as their capsules begin to open at the top. These plants are sometimes turned out of the pots when they are strong, and planted in warm borders; where, if the season prove very warm, the plants will flower pretty well, but in that case they seldom perfect their seeds.

Penthorum; a genus of the class Decandria, order Pentagynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five or ten cleft, acute, permanent. *Corolla:* petals often five (seldom more,) linear, very small, between the segments of the calix. *Stamina:* filamenta ten, bristle-shaped, equal, twice as long as the calix, permanent; antheræ roundish, deciduous. *Pistil:* germen coloured, ending in five conical upright styles, the same length with the stamina, and distant; stigmas blunt. *Pericarp:* capsule simple, five-cleft, with conical distant angles, five-celled. *Seeds:* nume-

rous, very small, a little compressed. *Observe.* It differs from *Sedum* in having no nectaries. Essential Character. *Calix:* five or ten-cleft. *Petals:* none, or five. *Capsule:* five-cusped, five-celled; according to Gærtner, compound, five-beaked.——The species are,

1. Penthorum Sedoides; *American Penthorum.* Leaves oblong, alternate; stalks about a foot high; flowers alternate, pedicelled, ascending. Biennial.—Native of Virginia. It flowers at the end of July, and ripens seed in autumn.

2. Penthorum Chinense. Stem simple, cylindrical; leaves elongate-linear-lanceolate, subpetiolate, unequally serrated; spikes cymose, terminal; seeds ovate, like horn.—This plant was brought into England from China by Sir George Staunton; and described, as above, by Frederick Pursh.

Pentstemon; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, five-parted, permanent; segments lanceolate, almost equal. *Corolla:* one-petalled, two-lipped; tube longer than the calix, gibbous above at the base, wider at top, and ventricose underneath; upper lip upright, in two ovate obtuse segments; lower lip longest, three-parted; the segments ovate, blunt, bent down, shorter than the tube. *Stamina:* filamenta four, filiform, diverging at the tip, inserted into the base of the tube, and shorter than it, the two lower longer; antheræ roundish, distant, included, bifid, with the lobes divaricating. The rudiment of a fifth filamentum, between the upper ones, is inserted into the tube, the same length with the stamina, filiform, straight, bearded above at the tip. *Pistil:* germen ovate; style filiform, the length of the tube, bent down at the tip; stigma truncate. *Pericarp:* capsule ovate, acute, compressed, two-celled, two-valved. *Seeds:* numerous, subglobular. *Receptacle:* large. Essential Character. *Calix:* five-leaved. *Corolla:* bilabiate, ventricose. Rudiment of a fifth stamen, bearded above. *Capsule:* two-celled.——The species are,

1. Pentstemon Lævigata; *Smooth Pentstemon.* Stem smooth; barren filamentum bearded above. Root perennial, creeping, fibrous, white; flowering branches in a manner dichotomous, with the flowers two together; corolla pale purple, somewhat hirsute on the outside.—Native of North America. This plant may be increased by sowing the seeds either in the autumn or early in spring the places where they are to remain, or in beds, to be removed in the beginning of summer to the borders or clumps of the pleasure ground.

2. Pentstemon Pubescens; *Hairy Pentstemon.* Stems pubescent; barren filamentum bearded from the tip below the middle. See *Chelone.*

3. Pentstemon Frutescens. Stem fruticose; branches angled, pubescent; leaves lanceolate, sessile, slightly glabrous; racemes terminal, subcorymbose; filament sterile, longitudinally bearded; flowers purple.—This small shrub was found by Lewis on the north-west coast of America, and sometimes attains to more than a foot in height.

Peony, or *Piony.* See *Pæonia.*

Peplis; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* bell-shaped, permanent, very large, with the mouth twelve-cleft; toothlets alternate, reflex. *Corolla:* petals six, ovate, very small, inserted into the throat of the calix. *Stamina:* filamenta six, awl-shaped, short; antheræ roundish. *Pistil:* germen oval; style very short; stigma orbiculate. *Pericarp:* capsule superior, cordate, two-celled; partition opposite. *Seeds:* very many, three-sided, very small. *Observe.* In many florets on the same plant the corolla is entirely wanting. In the second species the parts of fructification are less by one third. Essential Character. *Calix:* bell-shaped, with a twelve-cleft mouth. *Petals:* six, inserted into the calix, or none. *Capsule:* two-celled.——The species are,

1. Peplis Portula; *Water Purslane.* Flowers axillary, solitary; leaves stalked. This is an annual creeping plant; stems numerous, branched, dichotomous, from half a foot or a span to a foot in length, angular, jointed, of a reddish colour; flowers very small, solitary, reddish, opposite, sessile. It flowers from July to September.—Native of many parts of Europe, in bogs, marshes, ditches, and especially where water has stagnated in winter and becomes dry in summer.

2. Peplis Tetrandra. Flowers one-petallled, four-stamined. Annual.—Native of the West Indies, in dry shady places at the foot of mountains and trees.

3. Peplis Americana. Flowers axillary, solitary; leaves thick, spathulate-obovate; flowers without petals. This plant is inundated during its flowering time in slow-flowing places of rivers, in Pennsylvania. The flowers are so diminutive, that to examine them it requires a strong microscope.

Pepper. See *Piper.*

Pepper Grass. See *Pilularia.*

Pepper, Guinea. See *Capsicum.*

Pepper Mint. See *Mentha.*

Pepperwort. See *Lepidium.*

Perdicium; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common, oblong, imbricate, rayed; corollets hermaphrodite in the disk, female in the ray: proper of the hermaphrodite tubular, semibifid; inner lip two-parted, acuminate, equal, outer semitrifid, linear, equal; of the female linear, ligulate, three-toothed, two-toothed within at the base. *Stamina:* in the hermaphrodites; filamenta five, short; antheræ cylindric, tubular, five-toothed. *Pistil:* in the hermaphrodites; germen small; style simple; stigma bifid, blunt: in the females, style semibifid; stigmas blunt. *Pericarp:* none. *Calix:* unchanged. *Seeds:* solitary, obovate; down capillary, sessile, very copious, the length of the calix, fastigiate. *Receptacle:* naked. *Observe.* The flower resembles a semifloscular corolla, though it is really rayed. The character is taken from the first species, which is very distinct in the genus. The second species agrees with the genus in its bilabiate capsules, but differs in the whole habit. The third species has subradiate flowers, and hermaphrodite bilabiate florets in the disk and ray. Essential Character. *Corollets:* bilabiate. *Down:* simple. *Receptacle:* naked.——The species are,

1. Perdicium Semifloscular. Flower semifloscular; scape one-flowered, naked; root fibrous; down simple.—Native of the Cape.

2. Perdicium Radiale. Flowers subradiate; outer calix four-leaved; stem shrubby; flowers few, yellow. Browne, who calls it the Shrubby Trixis, says, that this little shrub is very common in the savannas about Kingston, Jamaica, and seldom rises above four or five feet in height. The common receptacles are disposed at the extremities of the branches, and the outer divisions of the flowers grow gradually smaller, and curl more downwards as they approach the centre; which gives the whole at first sight somewhat the appearance of a radiated flower.

3. Perdicium Brasiliense. Flowers subradiate; calices simple. Stem herbaceous; root-leaves lanceolate, ovate, repand-toothed, subpubescent, viscid; flowers at the top of the stem naked, several; corolla yellow.—Native of Brazil.

4. Perdicium Magellanicum. Leaves runcinate; stem two-leaved, simple, one-flowered; flower white, rayed.—This pretty little plant is a native of Terra del Fuego.

5. Perdicium Tomentosum. Leaves lyrate, tomentose underneath. This is a small, stemless, herbaceous plant. It flowers in April and May.—Native of Japan.

6. Perdicium Lævigatum. Stem rather shrubby; leaves stalked, lanceolate, entire, fringed; flower-stalks terminal, mostly in pairs.—Native of Porto Bello.

Pergularia; a genus of the class Pentandria, order Digynia, or rather Gynandria.—Generic Character. *Calix:* perianth one-leafed, five-cleft, upright, acute, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindrical, longer than the calix; border five-parted, flat, with oblong segments; nectaries five, semisagittate, erect, compressed, attenuated into a dagger point, curved inwards, with a nodding tooth at the outer base. *Stamina:* filamenta not ascertained; antheræ two to each gland, curved upwards, divaricating, obovate, pellucid, yellow, with scarcely any discernible pollen; tubercles (glands) five, immersed in the stigma. *Pistil:* germina two, ovate, acuminate; styles none, (two, very short, united, villose; stigmas obsolete, according to Smith.) *Pericarp:* follicles two. *Seed:* not ascertained. Essential Character. *Contorted. Nectary:* surrounding the genitals with five sagittated cups. *Corolla:* salver-shaped.——The species are,

1. Pergularia Glabra; *Smooth Pergularia.* Leaves ovate, acute, smooth; stem shrubby; peduncles axillary, subdivided, alternate.—Native of the East Indies.

2. Pergularia Edulis; *Eatable Pergularia.* Leaves ovate, acuminate, smooth; stem herbaceous.—Native of the Cape.

3. Pergularia Odoratissima; *Sweet-scented Pergularia,* or *Chinese Creeper.* Leaves heart-shaped, nearly smooth; nectary and genitals shorter than the tube of the corolla; stigma conical, obtuse. Root branching, much spreading, whitish; stem shrubby, twining, branched, round; flowers the size of the Primrose, pale yellowish green, with a sweet lemon-like smell, especially in the evening. There is a variety of this with somewhat rounder leaves, and more tawny flowers. It is cultivated for its agreeable fragrance in the gardens of the East Indies.—Its native place is uncertain. It thrives either in a stove or warm conservatory, flowering throughout the summer and autumn.

4. Pergularia Purpurea; *Purple Pergularia.* Leaves heart-shaped, smooth; segments of the corolla linear, oblong, smooth; umbels proliferous; branches twining, slender, ash-coloured, appearing villose when examined by a glass.—Native of the East Indies and of China.

5. Pergularia Japonica. Leaves heart-shaped, smooth; segments of the corolla ovate, villose within; umbels simple. Stem twining, round, smooth, simple; flowers axillary; peduncles erect.—Native of Japan, where it flowers in August.

Perilla; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, upright, half five-cleft; segments equal, the uppermost very short, permanent. *Corolla:* one-petalled, irregular, four-cleft; upper segment emarginate; lateral ones spreading; lowest longer, blunt. *Stamina:* filamenta four, simple, distant, shorter than the corolla; antheræ bifid. *Pistil:* germina four; styles two, filiform, connected, the length of the stamina; stigmas simple. *Pericarp:* calix unchanged. *Seeds:* four. Essential Character. *Calix:* uppermost segment very short. *Stamina:* distant. *Styles:* two, connected.——The species are,

1. Perilla Ocymoides. Leaves ovate, almost naked, serrate, on petioles the length of the leaves; racemes lateral, and terminating, rough-haired, upright; flowers small, white, solitary, or by threes, rough-haired in the calix, with leafy bractes longer than the flower. Annual. The whole plant has a strong balmy fragrance.—Native of the East Indies.

Periploca; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth five-cleft, very small; segments ovate, permanent. *Corolla:* one-petalled, wheel-shaped, five-parted; segments oblong, linear, truncated, emarginate; nectary very small, five-cleft, surrounding the genitals, putting out five threads, curved inwards, shorter than the corolla, and alternate with it. *Stamina:* filamenta short, curved inwards, converging, villose; antheræ twin, acuminate, converging over the stigma, with lateral cells; pollen-bags five at the notches of the stigma, each common to two antheræ. *Pistil:* germina two, ovate, approximating; styles uniting at top; stigma capitate, convex, five-cornered, with the corners notched. *Pericarp:* follicles two, large, oblong, ventricose, one-celled, one-valved, glued together at the tip. *Seeds:* very many, imbricated, crowned with a down. *Receptacle:* longitudinal, filiform. *Observe.* The character is taken from the first species. Essential Character. *Nectary:* encircling the genitals, and putting forth five threads.——The species are,

1. Periploca Græca; *Common Periploca.* Flowers internally hirsute, terminating; leaves ovate, acute. Stems shrubby, twining round any support, more than forty feet in height, covered with a dark bark, and sending out slender branches, which twine round each other. The flowers come out towards the ends of the small branches in bunches, and are of a purple colour. It flowers in July and August, but rarely ripens seed in England.—Native of hedges and thickets in the Levant. This is easily propagated by laying down the branches, which will put out roots in one year, and may then be cut from the old plant, and planted where they are to remain. These may be transplanted either in autumn when the leaves begin to fall, or in the spring before they begin to shoot, and must be planted where they may have support; otherwise they will trail on the ground, and fasten themselves about whatever plants are near them.

2. Periploca Secamone; *Green Periploca.* Flowers internally hirsute, panicled; leaves lanceolate, elliptic; flowers small.—Said to be a native of Egypt, but it is uncertain.

3. Periploca Lævigata; *Smooth Periploca.* Corollas smooth, with blunt segments; cymes trichotomous; leaves oblong, lanceolate, veined, even. Stem smooth; corolla greenish yellow within.—Native of the Canary Islands.

4. Periploca Angustifolia; *Narrow-leaved Periploca.* Corollas smooth; segments emarginate; cymes trichotomous; leaves lanceolate, veinless, even. Stem smooth; segments of the corolla more produced on one side, purple, within the edges pale yellow, with a whitish subtomentose dot toward the middle.—Native of various parts near the Mediterranean, as on Mount Shibel Ischel in the territories of Tunis.

5. Periploca Esculenta; *Esculent Periploca.* Corollas smooth, wheel-shaped; racemes axillary; leaves linear-lanceolate, veined. Root filiform, fibrous; stems and branches numerous, twining, round, smooth, running over bushes of considerable size; flowers large, beautiful white, with a small tinge of the Rose, and striated with purple veins, inodorous.—Native of the East Indies, where it grows in hedges and among bushes, on the banks of water-courses, pools, &c. casts its leaves during the dry season, and is in flower and foliage during the rainy season. Cattle eat it. From its elegant flowers, it deserves to be introduced into the flower-garden.

6. Periploca Emetica; *Emetic Periploca.* Corollas smooth; corymbs few-flowered, axillary; leaves linear-lanceolate, veinless. Stem shrubby, with diffused rod-like even branches.

—Thunberg says, the root is used as an emetic in the East Indies, where it is found growing at the foot of mountains.

7. Periploca Indica; *Indian Periploca.* Spikes axillary, imbricated; leaves elliptic, obtuse, mucronate. Stem smooth. —Native of Ceylon.

8. Periploca Capsularis; *New Zealand Periploca.* Leaves lanceolate, quite entire, opposite; cymes axillary, diffused. —Native of New Zealand.

9. Periploca Africana; *African Periploca.* Leaves ovate, acute; flowers corymbed; stem hirsute. This has many slender stalks which twine about each other, and by a shrub or other support will rise nearly three feet high, putting out several small side-branches; these are hairy, as are also the leaves. The flowers come out in small bunches from the side of the stalks; they are small, of a dull purple colour, and have a sweet scent. It flowers in the summer, but does not produce seeds here.—Native of the Cape. If sheltered under a common frame or green-house during winter, and removed abroad with other hardy exotic plants in summer, they will thrive, and flower very well; but as all the plants of this genus have a milky juice, so they should not have much wet, especially in cold weather, lest it rot them. They are easily propagated by laying down their branches, which in one year will have roots enough to transplant; these should be planted in a light sandy loam, not rich; and the pots must not be too large, for they will never thrive when overpotted.

10. Periploca Tunicata. Leaves oblong-heart-shaped, acuminate; flowers umbelled; stem twining, even.—Imported from Tranquebar.

11. Periploca Sylvestris. Leaves roundish-ovate, netted-veined, pubescent underneath; flowers umbelled. Stems shrubby, tomentose.—Native of the East Indies.

12. Periploca Cochin-chinensis. Stem arboreous; leaves fleshy; racemes terminating; flowers bluish white, on short racemes. It is a middling-sized tree, with spreading branches. —Native of Cochin-china and Bengal.

13. Periploca Fruticosa. Leaves oblong-cordate, pubescent; flowers axillary; stem shrubby, climbing. The flowers come out in small bunches from the wings of the leaves, they are small, white, and of an open bell-shape, and are succeeded by swelling taper pods, filled with seeds crowned with long feathery down.—Native of Vera Cruz. It is tender, and will not thrive in England, unless the plants are placed in a warm stove. They may be propagated by laying down their branches; or from seeds, when they can be procured from the places where they naturally grow. These should be sown upon a good hot-bed, and when the plants come up they must be treated like other tender exotic plants.

Periwinkle. See *Vinca.*

Perotis; a genus of the class Triandria, order Digynia.— —Generic Character. *Calix:* glume two, equal, acute, awned valves, containing a single flower. *Corolla:* two minute, awnless, membranaceous valves, much shorter than the calix; nectary two minute scales at the base of the germen. *Stamina:* filamenta three, capillary; antheræ oblong. *Pistil:* germen superior, oblong; styles two, capillary, shorter than the corolla; stigmas feathered, divaricating. *Pericarp:* none, except the closed permanent calix. *Seed:* one, linear-oblong. Essential Character. *Calix:* two equal awned valves. *Corolla:* two minute awnless valves. *Style:* deeply divided.——The species are,

1. Perotis Latifolia. Culm simple; leaves waved; joints smooth; sheath half an inch or more in length, whitish, especially towards its origin, ending in a scarcely visible whitish ligule; spike a hand or half a foot in length, very thin. It flowers in August and September.—Native of the East Indies.

2. Perotis Polystachya. Culm branching; leaves flat; joints bearded.—Native of the East Indies.

Persian Lily. See *Fritillaria.*

Persoonia; a genus of the class Tetrandria, order Monogynia. Essential Character. *Calix;* none. *Petals:* four, staminiferous towards the base; glands four at the base of the germen. *Stigma:* blunt. *Drupe:* one-seeded. *Observe.* This genus differs from *Loranthus,* to which it is nearly allied, in the number of parts, and in the want of a calix. It consists of subvimineous shrubs; leaves commonly alternate, without stipules; corolla smooth within; antheræ linear, finally bent back; style permanent, smooth; drupe eatable in most; flowers yellow. Twenty-two species are known, all natives of New Holland.

Perula; a genus of the class Dicœcia, order Polyandria. —Generic Character. *Male. Calix:* perianth two-leaved, very small; leaflets opposite, oblong, somewhat concave, spreading, the upper ones twice as big as the other. *Corolla:* petal one, semiglobular-concave, hanging down, heart-shaped at the base, scarcely emarginate at the tip; nectary membranes multifid, somewhat plaited, erect, inserted into the receptacle between the two rows of the stamina. *Stamina:* filamenta very many, (twenty-four to thirty,) set transversely in a double row, thick, upright, the height of the nectary; antheræ thickish, four-cornered, oblong, blunt, upright, raised above the nectary. *Pistil:* germina four, barren, very small, subglobular, very shortly pedicelled, placed at the angles of the receptacle above the nectary; style very short, upright; stigmas three, with segments peltate, standing out at the tips. *Female,* on a distinct tree. *Calix:* as in the male, deciduous. *Corollas:* as in the male; nectary as in the male, with the membranes approximating, somewhat inflated, filling the disk of the receptacle. *Pistil:* germina four, fertile, inserted into the receptacle, as in the male, a little larger, shortly pedicelled; style to each, upright, short, three-cornered; stigmas as in the male. *Pericarp:* capsule obovate, subtrigonal, hanging down from the elongated pedicel, three-celled, three-valved; valves bifid, at length two-parted. *Seeds:* solitary, obovate, truncated, smooth, small. *Observe.* The calix is rather a double bracte. The corolla before it unfolds is globular, with a longitudinal suture; when that opens, the original or proper orifice becomes transverse, the receptacle almost prominent beyond the corolla, and the flower hangs down from the nodding apex of the incurvated peduncle.——The only species is,

1. Perula Arborea.—Native of New Granada, about Mariquita.

Peruvian Mastick Tree. See *Schinus.*

Petaloma; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, goblet-shaped, five-toothed, superior, permanent; teeth sharp, almost upright. *Corolla:* petals five, oblong, spreading, each inserted by the claw between the teeth of the calix, deciduous. *Stamina:* filamenta ten, placed on the margin of the calix, longer than the corolla; antheræ oblong, incumbent. *Pistil:* germen ovate, in the bottom of the calix; style long, awl-shaped; stigma simple, acute. *Pericarp:* berry globular, fleshy, crowned with the calix, one-celled. *Seeds:* solitary, or in fours, angular on one side, convex on the other. Essential Character. *Calix:* goblet-shaped, five-toothed. *Petals:* five, inserted between the teeth of the calix. *Stamina:* on the margin of the calix. *Berry:* one-celled.——The species are,

1. Petaloma Myrtilloides. Peduncles solitary, one-flow-

ered; leaves subsessile, ovate, attenuated, oblique at the base. Trunk straight, twenty feet high, no thicker than the human leg; bark almost smooth, gray, with some very white spots, whence its name of *Silver Wood*. The wood is hard, tough, heavy, and good for looms, handles, staves for oars, or scouring rods for guns.—Native of Jamaica, and other parts of the West Indies.

2. Petaloma Mouriri. Peduncles corymbed, axillary; leaves petioled, ovate, acuminate; berries seeded. This is a tree, from thirty to forty feet in height, and a foot and half in diameter, with a grayish bark, and a whitish, hard, compact wood.—Native of Guiana, in the forests bordering on the river Sinemari, flowering in November, and fruiting in January. Named by the natives *Mouririchira*.

Petesia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, superior, with the mouth toothed. *Corolla:* one-petalled, funnel-form; tube cylindrical, longer than the calix; border four-parted; lobes rounded, blunt. *Stamina:* filamenta four, awl-shaped, the length of the tube; antheræ somewhat oblong. *Pistil:* germen inferior; style filiform; stigma bifid, acute. *Pericarp:* berry globular, crowned, two-celled. *Seeds:* very many, roundish. Essential Character. *Corolla:* one-petalled, funnel-form; stigma bifid. *Berry:* many-seeded.——The species are,

1. Petesia Stipularis. Leaves lanceolate-ovate, tomentose underneath; flowers in lateral thyrses.—This shrub is a native of Jamaica.

2. Petesia Carnea. Leaves oblong, lanceolate, even; flowers in terminating trifid cymes.—Native of the island of Namoka in the Great Southern Ocean.

3. Petesia Tomentosa. Leaves oblong, tomentose on both sides.—Native of the woods of New Spain.

Petitia; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, small, upright, four-toothed, inferior, permanent. *Corolla:* one-petalled; tube cylindrical, upright, long; border four-cleft; segments ovate, acute, flat, reflex, half the length of the tube. *Stamina:* filamenta four, awl-shaped, very short, in the upper part of the tube; antheræ upright. *Pistil:* germen roundish, superior: style awl-shaped, upright, the length of the stamina; stigma simple. *Pericarp:* drupe roundish. *Seed:* nut ovate, blunt, two-celled; kernels solitary, oblong. *Observe.* Flowers often three-stamined, with the calix and corolla trifid. Essential Character. *Calix:* four-toothed, inferior. *Corolla:* four-parted. *Drupe:* with a two-celled nut.——The only known species is,

1. Petitia Domingensis. This is a small tree, with four-cornered striated branches; flowers numerous, white.—Native of the woods of the island of St. Domingo.

Petiveria; a genus of the class Hexandria, or, according to Swartz, of the class Heptandria, order Monogynia.—Generic Character. *Calix:* perianth four-leaved; leaflets linear, blunt, equal, spreading, permanent. *Corolla:* none, except the coloured calix. *Stamina:* filamenta six to eight, unequal, awl-shaped, converging; antheræ erect, linear, sagittate, bifid at top. *Pistil:* germen ovate, compressed, emarginate; style very short, lateral, in the groove of the germen; stigma pencil-shaped. *Pericarp:* none, except the crust of the seed. *Seed:* single, oblong, narrower below, roundish, compressed, emarginate, with four barbed hooks, bent back outwards, rigid, acute, the middle ones longer; Gærtner says naked, but armed above with reflex spines. Essential Character. *Calix:* four-leaved. *Corolla:* none. *Seed:* one, with reflex awns at top.—These plants may be increased by slips or cuttings as well as seeds; which must be sown on a hot-bed early in the spring. When they appear, transplant each into a separate pot, and plunge the pots into a moderate hot-bed. When the plants have obtained a good share of strength, inure them by degrees to the open air, into which remove them towards the end of June, placing them in a warm situation, where they may remain till autumn, when they should be placed in the stove during winter, and have a moderate degree of warmth. They will produce flowers and seeds every summer, and continue several years constantly remaining green throughout the year.——The species are,

1. Petiveria Alliacea; *Common Guinea-hen Weed.* Flowers six-stamined. Root strong, striking deep into the ground; stems from two to three feet high, jointed, and becoming woody at the bottom. It is a common plant in most of the islands of the West Indies, where it grows in shady woods, and all the savannas, in such plenty as to become a troublesome weed. As this plant will endure much drought, it remains green when others are burnt up; the cattle then feed on it, and it gives their milk the taste of garlic, to which the specific name alludes; their flesh also becomes intolerably rank. Browne informs us, that it is very common in all the lower lands of Jamaica, and is so remarkably acrid, as to render the smell and taste hardly tolerable. On chewing a little of the plant, it burns the mouth, and leaves the tongue black, dry, and rough, as it appears in a malignant fever. It is however thought to be liked by Guinea-hens, and hence its name of Guinea-hen Weed.—It thrives most in a dry soil and a gravelly situation, and flowers in June.

2. Petiveria Octandra; *Dwarf Guinea-hen Weed.* Flowers eight-stamined. This is very like the first, but differs in having a shorter and narrower stalk, and in the flowers having eight stamina. Jacquin describes it as a shrubby plant, smelling strong of garlic.—Native of the West Indies.

Petrea; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped; border five-parted, spreading, very large, coloured, permanent; segments oblong, blunt, closed at the throat by five double abrupt scales. *Corolla:* one-petalled, wheel-shaped, unequal, less than the calix; tube very short; border flat, five-cleft; segments rounded, almost equal, spreading very much; the middle one larger, and of a different colour. *Stamina:* filamenta four, concealed within the tube of the corolla, ascending, two shorter; antheræ oval, erect. *Pistil:* germen ovate; style simple, the length of the stamina; stigma blunt. *Pericarp:* capsule obovate, flat at top, two-celled, concealed at the bottom of the calix. *Seed:* single, fleshy. Essential Character. *Calix:* five-parted, very large, coloured. *Corolla:* wheel-shaped. *Capsule:* two-celled at the bottom of the calix. *Seeds:* solitary. ——The only known species is,

1. Petrea Volubilis. It rises with a woody stalk, to the height of fifteen or sixteen feet, covered with a light gray bark, and sending out several long branches, having a whiter bark than the stem; the flowers are produced at the ends of the branches in loose bunches, nine or ten inches long; each flower upon a slender pedicel, about an inch in length. Dr. Houston found a variety of this with blue petals, of the same bright colour with the calix, and making a fine appearance, each branch being terminated by a long string of these flowers, whence he has ranked it in the first class of beautiful American Trees.—It is propagated by seeds, which must be obtained from the places where the trees grow naturally, and very few of them are good. They must be sown in a good hot-bed; and when the plants come up, they should be each planted in a separate small pot, filled with light loamy earth,

and plunged into a hot-bed of tanner's bark, and afterwards placed in the bark-bed in the stove, where they should constantly remain, and be treated like other plants from the same country.

Petrocarya; a genus of the class Heptandria, order Monogynia.—Generic Character. *Calix:* perianth one leafed, turbinate, five-cleft; segments ovate, acute, rigid, spreading, (the two upper ones more erect;) leaflets two, oblong, concave at the base of the perianth. *Corolla:* petals five, ovate, acute, unequal, less than the teeth of the calix, and inserted into it between the segments. *Stamina:* filamenta fourteen, capillary, longer than the teeth of the calix, inserted into the edge of it below the petals; seven antheriferous, the other seven in the opposite part of the calix, barren; antheræ seven, roundish, gaping inwardly. *Pistil:* germen ovate, villose; style cylindrical, curved in, villose, longer than the stamina; stigma capitate. *Pericarp:* drupe large, ovate, compressed, fleshy, fibrous, one-celled. *Seed:* nut ovate, compressed, sinuous-wrinkled, longitudinally tubercled; shell thick, very hard, two-celled; kernels oblong. Essential Character. *Calix:* turbinate, five-cleft, with two bractes at the base. *Corolla:* five-petalled, less than the calix. *Filamenta:* fourteen, seven of which are barren. *Drupe:* inclosing a two-celled nut, with a stony cell.——The species are,

1. Petrocarya Montana. Leaves ovate. This is a tree, with a trunk twenty-four feet high, dividing at the top into very thick, wide, spreading branches; the ramulets, or smaller branches, being villose, or reddish. The flowers are white; the drupe smooth, and fulvous, four inches long, with a thick acid bark; and the nut or kernel, in each loculament of the putamen, is sweet and edible.—Native of the woods of Guiana.

2. Petrocarya Campestris. Leaves cordate. This tree has a trunk from thirty to forty feet high, branching at top; flowers racemose, axillary, terminal, and resembling those of the preceding species.—Native of the woods of Guiana.

Petty-Whin. See *Genista.*

Peucedanum; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal manifold, very long, slender; partial spreading; involucres universal many-leaved, linear, small, reflex; partial less; perianth proper, five-toothed, very small. *Corolla:* universal uniform; florets of the disk abortive; partial of five, equal, oblong, incurved, entire petals. *Stamina:* filamenta five, capillary; antheræ simple. *Pistil:* germen, oblong, inferior; styles two, small; stigmas obtuse. *Pericarp:* none; fruit, ovate, girt with a wing, striated on both sides, bipartile. *Seeds:* two, ovate, oblong, compressed, more convex on one side, with three raised streaks, girt with a wide entire membrane; emarginate at top. Essential Character. *Fruit:* ovate, striated on both sides, girt with a membrane. *Involucres:* very short.—These plants are propagated by seeds sown in the autumn, soon after they are ripe, those which are sown in the spring seldom succeeding, or at best not coming up till the spring following. Keep the plants clean from weeds, and in the autumn transplant them where they are to remain. They love a moist soil, and a shady situation, but will not thrive under the drip of trees.——The species are,

1. Peucedanum Officinale; *Common Sulphurwort.* Leaves five times three-parted, filiform, linear; root perennial, dividing into many strong fibres which run deep into the ground; stem upright, from two to four feet high, slightly striated, bright green, jointed, smooth; umbel large, the water rays longest; fruit middle-sized, compressed into the shape of a thin lens; seeds subfoliaceous, surrounded by a very narrow attenuated rim, having on the flat sides two dark ferruginous fillets, as in the Parsnep. The root has a strong fœtid smell, and an acrid bitterish unctuous taste. Wounded in the spring, it yields a considerable quantity of yellow juice, which dries into a gummy resin, and retains the strong scent of the root. Its virtues have not been properly ascertained. There is a variety called Italian Sulphurwort, which is a much larger plant; the leaflets are also much longer, and the flowers and seeds bigger. It grows on the mountains, and also in the low vallies, by the side of rivers in Italy. The Common Sulphurwort is a native of the most southern parts of Europe, in moist meadows. Gerarde found it growing very plentifully, on the south side of a wood belonging to Waltham, at the Nase, in Essex; also at Whitstable and Feversham, in Kent. Ray observed it near Shoreham, in Sussex; and adds, that it was said to grow abundantly on the banks of the Thames, and in the marsh-ditches near Walton, not far from Harwich. It has been more recently observed near Feversham, and near Yarmouth and Clay, in Norfolk.

2. Peucedanum Alpestre; *Alpine Sulphurwort.* Leaflets linear, branched; roots perennial. Stems round, not so deeply channelled as in the preceding, sustaining a large umbel of yellow flowers. It flowers in June, and the seeds ripen in September.—Native of the forest of Fontainbleau, and some other parts of France; also of Germany.

3. Peucedanum Capillaceum; *Hairy-leaved Sulphurwort.* Leaves bipinnate; segments capillaceous, grooved.—Native of the Cape of Good Hope.

4. Peucedanum Tenuifolium; *Fine-leaved Sulphurwort.* Leaves bipinnatifid; segments lanceolate, opposite and alternate, margined.—Native of the Cape of Good Hope.

5. Peucedanum Sibiricum; *Siberian Sulphurwort.* Leaflets linear, acute; primordial umbels sessile. It has no universal involucre.—Native of Siberia.

6. Peucedanum Japonicum; *Japanese Sulphurwort.* Leaves five times three-parted; leaflets wedge-form, trifid. Stem round, flexible, upright, branched, the thickness of a goose-quill, scarcely a foot high.—Native of the coast of Japan.

7. Peucedanum Silaus; *Meadow Sulphurwort,* or *Saxifrage.* Leaflets pinnatifid; segments opposite; universal involucre two-leaved. Root perennial, long, wrinkled, black on the outside, white within, having a sweet aromatic flavour, with some sharpness; stems several, from two to three feet in height, almost as thick as the little finger at bottom, round, striated, full of pith, red near the ground, branched from the bottom, the branchlets coming out at long intervals from the axils of the leaves; flowers greenish-white, and are generally all fertile, but some of the central ones are sometimes barren. The whole plant has a strong, but not unpleasant smell, approaching to that of Parsneps.—Native of many parts of Europe, as Switzerland, France, Germany, England, &c. in moist meadows. It flowers in August.

8. Peucedanum Alsaticum; *Small-headed Sulphurwort.* Leaflets pinnatifid; the little segments trifid, bluntish. Stem upright, three or four feet in height, and sometimes as high as a man, round, slightly striated, grooved only towards the top, very smooth, tinged with red, and wholly red at the base, jointed, dichotomous. Umbels very copious, small, yellowish. It flowers in June and July.—Native of Germany, Switzerland, and Italy.

9. Peucedanum Aureum; *Golden Sulphurwort.* Leaves bipinnate; leaflets of the stem-leaves linear-lanceolate, of the root-leaves oblong and multifid. It is a biennial plant, flowering in June.—Native of the Canaries.

10. Peucedanum Nodosum; *Knobbed Sulphurwort.* Leaflets alternately multifid. The stalks rise a foot and a half high, having pretty large knots at the joints, from each of

which springs a leaf, cut into many divisions; the flowers terminate the stalks in umbels, and appear in the beginning of July.---Native of Candia.

11. Peucedanum Geniculatum; *Jointed Sulphurwort.* Leaves roundish, kidney-form, crenate.---Native of New Zealand.

Peziza; a genus of the class Cryptogamia, order Fungi.---Generic Character. Fungus bell-shaped, sessile, concealing lens-shaped seed-bearing bodies; plant concave; seeds on the upper surface only discharged by jerks. Dr. Withering has given a great number of British species of this Fungus in his Arrangement, to which the reader is referred. Persoon defines 151 species of this plant, which he divides into seven sections.

Phaca; a genus of the class Diadelphia, order Decandria. ---Generic Character. *Calix:* perianth one-leafed, tubular, five-toothed. *Corolla:* papilionaceous; standard obovate, straight, larger; wings oblong, blunt, shorter; keel short, compressed, blunt. *Stamina:* filamenta diadelphous, (simple and nine-cleft;) antheræ roundish, ascending. *Pistil:* germen oblong; style awl-shaped, ascending; stigma simple. *Pericarp:* legume oblong, inflated, half two-celled, with the upper suture depressed towards the lower. *Seeds:* several, kidney-form. *Observe.* The legume is straight in some, in others recurved, so that the tip almost touches the base. In some species of *Astragalus*, the partition of the legume not being fastened to the lower suture, though it approximates to it, the great affinity between that genus and this is apparent. Essential Character. *Legume:* two celled.---The plants of this genus are propagated by seeds, sown where they are intended to remain. They should be left about six feet asunder, that there may be room to dig between them every spring, which is all the culture they require, except keeping them clean from weeds.——The species are,

1. Phaca Boetica; *Hairy Bastard Vetch.* Caulescent, erect, hairy. Legumes round, boat-shaped; roots perennial, running very deep into the ground; stems commonly near four feet high, becoming woody, but decaying every autumn; flowers in spikes, copious, large, and handsome, pure white, but seldom opening in England, unless the season proves very warm, and never producing seeds here.—Native of Spain.

2. Phaca Alpina; *Alpine Bastard Vetch.* Caulescent, erect, hairy: legumes round, boat-shaped. This has smooth stalks, which do not rise so high as those of the preceding; the flowers are smaller, the pods shorter, and hanging down. It flowers in July, in two years from the seeds, and the roots rarely live longer than three or four years. Flowers yellow. ---Native of Siberia, Lapland, Austria, &c.

3. Phaca Salsula; *Salt Bastard Vetch.* Caulescent, erect, canescent: leaves pinnate; legumes peduncled, globular, drooping.---Native of Siberia.

4. Phaca Sibirica. Caulescent: leaflets in fours, lanceolate, blunt, silky; calix villose; teeth bristle-shaped.--Native of Siberia, in very dry sand.

5. Phaca Australis; *Trailing Bastard Vetch.* Stem branched, prostrate; leaflets lanceolate; wings of the flowers semibifid. Flowers white, with a purple-tipped keel. When young it is hirsute, but as it advances it becomes smooth, and appears like a different plant. It flowers in May and June.---Native of the south of Europe.

6. Phaca Trifoliata; *Three-leaved Bastard Vetch.* Leaves ternate, oval, blunt; legumes semiorbiculate; stems filiform, branched.---Native of China.

7. Phaca Vesicaria; *Smooth Bladdery Bastard Vetch.* Stemless, smooth: fruiting calices ovate, inflated; leaflets lanceolate; root-leaves pinnate, twelve-paired, and more; scapes upright, terminated by a raceme. Flowers large and handsome.---Native of the Levant.

8. Phaca Incana; *Hoary Bladdery Bastard Vetch.* Stemless, hoary: fruiting calices ovate, inflated, villose; leaflets oblong, blunt; scape a span long, round, upright. It differs from the preceding in its hoariness, the villoseness of the fruiting calices, and in having oblong, blunt, approximating leaflets; flowers sessile, the lower ones more remote, spreading.---Native of Armenia.

9. Phaca Prostrata; *Procumbent Bastard Vetch.* Stemless: leaflets binate, linear, silky; scape procumbent; calix villose; teeth lanceolate, short.---Found in the salt-sands, about the lakes of Siberia.

10. Phaca Microphylla; *Small-leaved Bastard Vetch.* Stemless: leaflets binate, ovate, obtuse, villose; calix muricate and hairy; teeth hispid every way; corolla large, purple. ---Found by Pallas in the sandy islands of Siberia.

11. Phaca Muricata. Stemless: leaflets in threes or fours, linear, awl-shaped, muricate underneath; calix smooth; teeth ciliate; root-leaves several, from a villose tuft, longer; corollas yellow.---Found by Pallas in the mountainous fields of Siberia.

Phæthusa; a genus of the class Syngenesia, order Polygamia Superflua.---Generic Character. *Calix:* common many leaved; leaflets in a double row, oblong, gaping at the tip, blunt. *Corollas:* compound, half-radiate; corollets hermaphrodite, several in the disk; females one to three in the ray, only on one side of the flower; proper of the hermaphrodites funnel-form, five-toothed, pubescent; female ligulate, oblong, toothed, very long. *Stamina:* in the hermaphrodites; filamenta five, very short; antheræ cylindrical, tubular, a little longer than the corolla. *Pistil:* in the hermaphrodites; germen oblone, villose; style filiform, longer than the stamina; stigmas two, reflex: in the females; germen oblong, a little bigger; style filiform, the length of the hermaphrodites; stigmas two, reflex. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites, solitary, oblong, compressed, villose; down of two awns: in the females, very like the others. *Receptacle:* chaffy; chaffs linear, acute, longer than the calix. Essential Character. *Calix:* subcylindric, many-leaved, with unequal recurved scales; florets, hermaphrodite, several in the disk; females, one or two in the ray. *Receptacle:* chaffy. *Seeds:* hispid, without any proper down.——The only known species is,

1. Phæthusa Americana. Stem gigantic, eighteen feet high, narrowly four-winged by the decurrent petioles; leaves large, opposite, ovate, acuminote, triple-nerved, obsoletely serrate, subpubescent. Pursh strongly suspects this plant to be the same with *Verbesina Siegesbeckia;* although Michaux considers it to be different.---Native of Virginia.

Phalaris; a genus of the class Triandria, order Digynia. ---Generic Character. *Calix:* double, one-flowered; outer glume two-valved, compressed; valves boat-shaped, compressed, keeled, acute, almost equal, with the edges straight, converging parallelly; inner two-valved; valves lanceolate, acute, pubescent, small, incumbent on the back of the corrolla at the base. *Corolla:* two-valved, less than the calix; valves oblong, concave, acute, the inner smaller; nectary two-leaved; leaflets lanceolate, acuminate, hyaline, gibbous at the base. *Stamina:* filamenta three, capillary; antheræ oblong, forked. *Pistil:* germen ovate; styles two, capillary, connate at the base; stigmas villose. *Pericarp:* none: the corolla grows round the seed like a crust, and does not open. *Seed:* single, ovate, oblong, acuminate, smooth. Essential Character. *Calix:* two-valved, keeled, the valves equal in length, inclosing the corolla.——The species are,

1. Phalaris Canariensis; *Cultivated Canary Grass.* Panicle awnless, subovate, spike-shaped; calicine glumes boat-shaped, entire; corolla four-valved, outer-valves lanceolate, smooth, inner villose. Root annual; culm from a foot to eighteen inches in height, upright, round, striated, swelling a little at the joints, and at the lower ones often branching; leaves almost half an inch in breadth, of a lively green, with something of a glaucous hue. The lower part of the upper leaf swells out like a spathe, completely involving and protecting the head of the flowers while young.—It is a native of the Canary Islands; but is now found in a wild state in Britain, Flanders, Hesse, Silesia, France, Italy, and Spain. It has been observed in New's-wood, adjoining to Malvern in Worcestershire; behind the observatory at Oxford; near New-Cross, on the Maidstone road; by Deptford creek; and in Charlton wood. It flowers from June to August; and is cultivated for the sake of the seeds, which are the best food for the Canary, and other small birds.—The cultivation of this grass is chiefly confined to the isle of Thanet, where it is esteemed a profitable crop; and may be so, where there is water carriage to London, for there is the principal demand for it. Sow the seeds thin, on drills made a foot asunder; when the plants come up, thin them where they are too close, so as to leave them at nearly two inches' distance in the rows. Hoe the ground three times in the intervals, to destroy the weeds. Two gallons of seed is sufficient to sow an acre; and if the seed be sown by a hopper, the spring of which is properly set, to let it out at equal distances, this will be the best method of cultivating Canary Grass. As this seed is a slow grower, it is liable to be overrun with weeds, for which reason it should be sown after clover, on a gentle clay; but on strong soils, a fallow is the best tilth. It is in general a valuable crop; and the chaff produces better, and a greater quantity of horse meat, than any other. The seed should be sown at the end of February, or beginning of March, in furrows, twenty to the rod, and six gallons of seed to the acre. The land must be dunged with fifty or sixty cart loads on an acre.

2. Phalaris Aquatica; *Water Canary Grass.* Panicle awnless, cylindrical, spike-shaped; calicine glumes boat-shaped, somewhat toothletted; corolla three-valved, inner valves villose, outer minute, awl-shaped. Root annual according to Linneus; perennial and bulbous, according to Desfontaines. Culm reedy: from the swelling sheath of the upper leaf issues one smooth, thick, spike-shaped panicle, of an oblong-ovate form. Flowers in June and July.—Native of Egypt.

3. Phalaris Capensis; *Cape Canary Grass.* Panicle spiked, ovate; glumes entire; culm jointed, decumbent; annual.—Native of the Cape of Good Hope.

4. Phalaris Bulbosa; *Bulbous Canary Grass.* Panicle awnless, cylindrical, spike-shaped; calicine glumes boat-shaped, toothed; corolla two-valved, smooth; root bulbous; culm a foot high, swelling out at the base, commonly into three round bulbs, one above another, the lower having filiform fibres at the bottom.—Native of Spain, the Levant, and Barbary; in which latter country the roots are not bulbous; but that, in Grasses, does not make a specific distinction.

5. Phalaris Nodosa; *Knobbed-rooted Canary Grass.* Panicle oblong; leaves rigid.—Native of the south of Europe.

6. Phalaris Dentata; *Tooth-keeled Canary-Grass.* Spike subpanicled, cylindric; glumes serrate; culm jointed. This is a handsome grass, and very distinct from the other species at first sight.—Native of the Cape of Good Hope.

7. Phalaris Phleoides; *Cat's-tail Canary Grass.* Panicle nearly cylindrical, spike-form; glumes, linear-lanceolate, smoothish, their inner margin abrupt. Stem simple; root fibrous, perennial, crowned with tufts of spreading glaucous leaves, which endure the whole winter; culm simple, generally solitary, mostly leafy below, round, smooth, purple and shining above, from ten to eighteen inches in height.—Native of several parts of Europe, and Siberia. In England, it was first observed in Cambridgeshire; and afterwards on Chippenham Park wall, in the same county. It flowers in June and July. Some botanists rank this and the two next species in the genus Phleum.

8. Phalaris Arenaria; *Sea Canary Grass.* Panicle awnless, cylindrical, spike-form; calicine glumes keeled, quite entire, ciliate; culm branched. Root annual, fibrous, downy; stems several, dividing from the crown of the root, or a little higher, as in wheat, sometimes bent in at the joints, clothed with leaves, the edge of which is a little rough, their sheaths long, inflated, striated, and smooth.—Native of several parts of Europe. In England, it is common on sandy coasts, and in the adjoining fields: as at Yarmouth; on Newborough sands; in the isle of Anglesea; on Swaffham and Newmarket heaths; and near Preston Pans, in Scotland.

9. Phalaris Aspera; *Rough Canary Grass.* Panicle awnless, cylindrical, spike-form; calicine glumes keeled, gibbous at top; corolla two-valved, smooth; root annual, fibrous; culms a span high, upright, branched, and sheathing at the base.—Native of several parts of Europe, as France, Italy, and Sicily. In England, it occurs on Gogmagog-hills, Newmarket heath, and near Bourn Bridge, in Cambridgeshire; and in the meadows below King's Weston, near Bristol.

10. Phalaris Utriculata; *Bladdery Canary Grass.* Panicle ovate, spike-form; calicine glumes boat-shaped, dilated at the back; awn longer than the glumes; root annual, fibrous; culms a foot high, several upright, decumbent before flowering time. It flowers in June and July.—Native of Italy. This species should be ranked in the genus Alopecurus.

11. Phalaris Paradoxa; *Bristly-spiked Canary Grass.* Panicle awnless, oblong, spike-form; calicine glumes boat-shaped, one-toothed; corolla two-valved, smooth; lowest florets end-bitten; root annual, fibrous.—Native of the Levant and Barbary.

12. Phalaris Hispida; *Hairy-caliced Canary Grass.* Spikes digitate; glumes rugged; leaves ovate; culms capillary, decumbent, erect at top, jointed, smooth, branched, a foot high; spikes from three to six.—Native of Japan.

13. Phalaris Villosa. Panicles many-flowered; flowers ovate, villose.—Grows in the woods of Carolina.

Phallus; a genus of Fungus.—Generic Character. Fungus even on the under surface; a net-work of cells on the upper surface; seeds in the cells.——The species are,

1. Phallus Esculentus; *Esculent Morel.* Pileus or cap ovate, cellular; stipe or stem naked, wrinkled. This stem is hollow, naked, and white, one or two inches high, and from half an inch to an inch in diameter. The cap is entirely united to the stem, from the size of a pigeon's to that of a swan's egg; with very large cells, angular like a honey-comb; the colour of the cap is pale yellow, or buff when young, but becomes brown when old. There is a variety which is small, and black, found on the sandy heaths of Norfolk. Mr. Sowerby gathered plenty of the blackish Morels at Newington in Surry, on an old garden ground, among sugar-baker's rubbish. It is commonly found in woods, under hedges, and among bushes, in a loamy soil, and springs up in April and May: it has an agreeable smell. We are informed, that Morels are observed to grow in the woods of Germany, in the greatest plenty where charcoal has been made. Hence, the people who collected them to sell, made fires in the woods with heath, broom, &c. to obtain a more plentiful

crop; until so much mischief had arisen from this practice, that it was found necessary to forbid it by law. According to Mr. Sowerby, in his elaborate work on English Fungi, the Morel belongs much more properly to the genus *Helvella*, if we consider its texture, duration, and qualities. It is well known, and much esteemed as an ingredient in gravies and ragouts, both recent and dried; for this purpose, it may be kept many months, or even years. In Great Britain, it has been observed at Moor Barns, Trumpington, Triplow, &c.; in Magdalen College walks, Headington Wick Coppice, and Shotover plantations: at Stone, and Swanscomb, in Kent; at Boughton, Walcot, Weekly, &c. in Northamptonshire; near Asply and Onthorp, in Nottinghamshire; in Scotland, at Blair in Athol; in the woods at Langholm in Eskdale; and in Logton wood, near Dalkeith, &c.

2. Phallus Impudicus; *Obscene* or *Stinking Morel.* Pileus or cap cellular above, even underneath, not united to the stem; stem perforating the pileus, and open at the end; roots fibrous; fibres large, round, white, creeping a little under the surface, with white globules or tubercles growing to them here and there, which when full-grown project above ground, and appear in the form of eggs, a little flattened at the base, smooth, the size of a tennis-ball, white, and heavy. On the bursting of this, the stalk rises up, and is about the thickness of the thumb, four inches and more in height, a little crooked, round, white, spongy, hollow, very light, and pointed at both ends. Cap somewhat conical, sitting loosely on the stalk, at first smooth, solid, olive-coloured, slippery, soon becoming highly fetid; the cells being as yet filled with the matter containing the seed, which flowing out, or being eaten by the flies, the outer surface appears cellular, the inner a little wrinkled, the top as if cut off, very white, oblong, and open. Though this Fungus is so intolerably fetid, yet in its egg state it has no offensive smell; the odour resides in the green matter which fills the cells of the cap, and is commonly very soon devoured by flies, particularly the large blue flesh-fly. It remains many days in the egg-state, before it bursts through its wrapper; but this being done, the stem pushes up with amazing rapidity, attaining the height of four or five inches in a few hours. The offensive green matter, already noticed, contains the seeds, which may be seen by the assistance of a good microscope. Such as have courage to smell this matter closely, will find it much less disagreeable than at a distance, for it then seems to have a slight pungency, like that of volatile salts. The wrapper is filled with a clear jelly, like the white of an egg, but stiffer; within this is found the green matter, and within that the young plant: when it shoots up, the wrapper and the clear jelly remain at the root. The disagreeable carrion-like smell of this Fungus has occasioned it to be called *Stinkhorns* in some counties. It nourishes not only several species of flies, but also snails and slugs, which are extremely fond of the stem. In August, September, and October, it appears in woods and hedge-rows, in some places abundantly, in others but sparingly. It has been found near London, about Hackney; in Coomb wood at Norwood; in the closes about Streatham; but more plentifully in a small fir wood on Hampstead heath. It has been noticed in sandy places near Bungay in Suffolk; in Kingstone woods, Oxfordshire; at Silsoe and Market Street in Bedfordshire; at Middleton in Nottinghamshire; in the woods of Blair, at Athol; and in the sands by the sea side, on both sides of the Forth, and at Carubber bank, in Scotland.

3. Phallus Caninus; *Red-headed Morel.* Pileus or cap wrinkled, red, covered with a greenish matter, conical, closed at the end; stem yellow, tapering at the bottom; volva the size of a nutmeg, of an oblong ovate shape, white, smooth, gelatinous within, the inner coat cut off at top; stalk beyond the volva, an inch and half or two inches in length, the size of a large goose-quill, round, filiform, terminating in a point at bottom, cellular, somewhat transparent, of a pale orange colour, hollow within, soon becoming flaccid; head sitting on the stem, sessile, about half an inch in length, and of the same diameter with the stem, oblong, a little pointed, impervious, and whitish at top, at first of a livid colour, and covered with a very thin shining membrane, under which is a small quantity of a greenish liquid almost without scent; which being removed, the surface of the head appears of a red colour, and transversely wrinkled, but by no means cellular, as in the stinking Morel. This Fungus was first discovered in this country in the woods and shady places near Shrewsbury; it has also been found about Caen wood, and about Silsoe in Bedfordshire. Curtis observes, that the structure of the head by no means agrees with Linneus's generic character. It differs from the preceding species, in having no pileus properly speaking, but the part, on the outside of which the seminal matter is lodged, forms a head, which is only a continuation of the stalk, differing in its structure and colour: this head has a wrinkled, not articulated surface; within these wrinkles, which are not very deep, the seminal matter is contained, and covered by a very thin membrane.

Pharnaceum; a genus of the class Pentandria, order Trigynia.---Generic Character. *Calix:* perianth five-leaved; leaflets subovate, concave, spreading, equal, permanent, coloured within, having a thin edge. *Corolla:* none; hence the edge of the calix is thin, and the inside of it is coloured. *Stamina:* filamenta five, awl-shaped, the length of the calix; antheræ bifid at the base. *Pistil:* germ ovate, three-cornered; styles three, filiform, the length of the stamina; stigmas blunt. *Pericarp:* capsule ovate, obsoletely three-cornered, covered, three-celled, three-valved. *Seeds:* numerous, shining, orbicular, depressed, surrounded by a sharp rim. *Observe.* The parts of fructification differ in the sixth species. Essential Character. *Calix:* five-leaved. *Corolla:* none. *Capsule:* three-celled, many-headed.——The species are,

1. Pharnaceum Cerviana; *Umbelled Pharnaceum.* Peduncles subumbelled, lateral, equalling the linear leaves.—Annual, flowering in June.---Native of Russia and Spain.

2. Pharnaceum Lineare; *Linear-leaved Pharnaceum.* Umbels unequal; leaves linear, in remote opposition. Stem even, prostrate, jointed, with knobbed knots, dichotomously branched; flowers in a spurious umbel, of a tawny hue.—Native of the Cape of Good Hope.

3. Pharnaceum Teretifolium; *Round-leaved Pharnaceum.* Leaves filiform, mucronate; umbels lateral. Stem erect, frutescent.—Native of the Cape of Good Hope.

4. Pharnaceum Microphyllum. Tomentose: peduncles umbelled; leaves ovate, roundish, obtuse, interwoven with wool; flowers few, yellowish.—Native of the Cape.

5. Pharnaceum Marginatum. Leaves ovate, margined, blunt; flowers axillary, sessile.—Native of the Cape.

6. Pharnaceum Mollugo; *Bedstraw Pharnaceum.* Peduncles one-flowered, lateral; flowers the length of the leaves. Stem depressed; root annual; peduncles at the whorls, not at the forkings of the stem, four or five, the length of the leaf, one-flowered. The whole plant in its appearance greatly resembles Illecebrum Ficoideum.—Native of the East Indies and Cochin-china.

7. Pharnaceum Glomeratum. Flowers glomerate; stem flexuose; leaves linear. Root annual.—Native of the Cape of Good Hope.

8. Pharnaceum Serpyllifolium. Peduncles one-flowered, axillary; leaves ovate, blunt. Stems branched, dichotomous, filiform, jointed, smooth; peduncles lateral, capillary, the length of the leaves.—Native of the Cape.

9. Pharnaceum Quadrangulare. Subfruticose: leaves linear, imbricate, in four rows. The stems are rather shrubby, having the appearance of heath; flowers white, green on the outside.—Native of the Cape.

10. Pharnaceum Incanum; *Hoary Pharnaceum.* Common peduncles very long; leaves linear; stipules hairy. Shrubby, with an upright proliferous stem; branches whitish, with tunicated stipules; flowers green and white.—Native of the Cape, and of Cochin-china.

11. Pharnaceum Albens. Common peduncles very long; leaves linear, without stipules. This is a little shrub with white stems.—Native of the Cape of Good Hope.

12. Pharnaceum Dichotomum; *Forked Pharnaceum.* Peduncles axillary, elongated, dichotomous; leaves in whorls, linear. Annual.—Native of the Cape.

13. Pharnaceum Distichum. Racemes two-parted, flexuose; leaves sublinear, pubescent; flowers small; capsule one-celled.—Native of the East Indies.

14. Pharnaceum Cordifolium. Racemes two-parted, terminating; leaves obcordate. Root fibrous; stems herbaceous, a foot high, prostrate, even, knobbed at the joints; branches alternate; flowers white.—Native of the Cape.

Pharus; a genus of the class Monœcia, order Hexandria.—Generic Character. *Male Flowers:* peduncled. *Calix:* glume two-valved, one-flowered; valves ovate, membranaceous, coloured; outer short, sharpish; inner twice as long, rounded at the tip. *Corolla:* glume two-valved, longer than the calix; valves equal, oblong, membranaceous, coloured; outer sharpish, keeled below the tip; inner emarginate. *Stamina:* filamenta six, very short, upright; antheræ linear, cloven at both ends, the length of the corolla. *Female Flowers:* larger, sessile, in the same panicle. *Calix:* glume two-valved, one-flowered; valves lanceolate, membranaceous, sharpish, nerved, almost equal. *Corolla:* glume two-valved, a little longer; outer valve subcylindric, rigid, closely pubescent; end three-sided, sharp; back keeled, bent back, and shaved at the base; inner valve linear, very narrow, membranaceous, with the margins folded together, the edge thickened on both sides, pubescent, with the tip cloven, the same length with the outer. *Pistil:* germen linear; style simple; stigmas three, capillary, pubescent, prominent from the outer corolline glume. *Pericarp:* none; the outer glume of the corolla enlarged invests the seed, muricated all round with soft adhering little hooks. *Seed:* oblong, grooved on one side, large. *Observe.* Schreber could not perceive any nectary.—Essential Character. *Calix:* glume two-valved, one-flowered. *Male Corolla:* glume two-valved. *Female Corolla:* glume one-valved, long, involving. *Seed:* one.——The species are,

1. Pharus Latifolius; *Wild Jamaica Oat.* Panicle branched; calices apetalous, naked, awnless. This grass has many filamenta, three or four inches long, with lateral fibrils uniting in a roundish root; root-leaves several, encompassing the stalk, and one another by their footstalks, which are striated, of a light brown colour, and about nine inches long; stalk about a foot and half high, having below two very short joints dividing at a foot from the ground into several branches, on which are naked flowers half an inch in length, sessile, alternate. The male flowers are smaller than the females, and stand on pretty long peduncles at the back of the others.—Native of the woody hills of Jamaica, where it is called Wild Oats, and is reckoned wholesome food for cattle.

2. Pharus Ciliatus. Panicle somewhat branched; calices apetalous, ciliate, awnless; culms very leafy, two feet high; leaves linear, narrow, rugged.—Native of the East Indies.

3. Pharus Aristatus. Panicle umbelled; calices apetalous, awned, naked; culm above the water, scarcely two feet in height.—Native of the East Indies.

Phaseum; a genus of the class Cryptogamia, order Musci.—Generic Character. *Capsule:* ovate, veiled, subsessile, or on a short bristle, closed on every side, sometimes with the rudiment of a lid, never opening. *Males:* subdisciod, terminating, or gemmaceous, axillary.—For the species, the reader is referred to *Withering's Arrangement.* They are found chiefly on banks and heaths, but sometimes in bogs.

Phaseolus; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, two-lipped; upper lip emarginate; lower three-toothed. *Corolla:* papilionaceous; banner heart-shaped, blunt, emarginate, reclined, the side bent back; wings ovate, the length of the banner, placed on long claws, keeled, narrow, rolled spirally contrary to the sun. *Stamina:* filamenta diadelphous, (simple and nine-cleft,) within the keel, spiral; antheræ ten, simple. *Pistil:* germen oblong, compressed, villose; style filiform, bent in spirally, pubescent above; stigma blunt, thickish, villose. *Pericarp:* legume long, straight, coriaceous, blunt, with a point. *Seeds:* kidney-form, oblong-compressed. Essential Character. *Keel:* with the stamina and styles spirally twisted.—The seeds of the *tenderest species,* which are cultivated either for curiosity or ornament, should be sown in a moderate hot-bed in the spring; and when the plants come up, they must be carefully transplanted into pots, filled with light fresh earth, and plunged into a hot-bed to facilitate their taking root; after which they should be inured to bear the open air by degrees, and may be removed into it at the end of June or beginning of July, in a sheltered situation. As they advance in growth, the perennial sorts must be removed into larger pots. Some that are less tender may be sown on a warm border at the end of April; and when the plants run up, they must be supported.——The species are,

* *Climbing.*

1. Phaseolus Vulgaris; *Common Kidney Bean.* Stem twining; flowers racemed, in pairs; bractes smaller than the calix; legumes pendulous; leaves ternate, acuminate, rounded at the base, rough, on long petioles; corolla white, yellow, purple, or red; legume oblong, swelling a little at the seeds, when ripe one-celled; seeds several, ovate or oblong, kidney-shaped, smooth, and shining: they vary exceedingly in shape and size, but particularly in colour, being white, black, blue, red, and variously spotted. The varieties of this species are very numerous; the principal are the small White Dwarf, the Black Dwarf or Negro, and the Liver-coloured Bean for early crops. There is also the Battersea and Canterbury, and the large Dutch, which last grows very tall. Also the Scarlet Bean, the twining stalks of which, if properly supported, will rise to the height of twelve or fourteen feet; its leaves are smaller than those of the Common Garden Bean; the flowers grow in large spikes, are much bigger, and of a deep scarlet colour, the pods are large and rough; and the seeds are purple, marked with black, though sometimes pure white.—Native of the East Indies; but is much cultivated in our gardens for the use of the table: it is the young shells, or pods, that are eaten, and these are very wholesome, but when they grow old they are apt to occasion flatulencies and indigestion. They are reported to be of a diuretic nature, and to cleanse the kidneys and ureters of gravel and sabulous concretions; but they are little regarded

except for food.—*Propagation and Culture.* The following are the best methods of raising Kidney Beans for the table. The three sorts which are usually cultivated for early crops, are the Small White Dwarf, the Dwarf Black, which is called the Negro Bean, and the Liver-coloured Bean. The stalks of these never being very long, may be planted much nearer together than the larger-growing kinds, and they require but little support. They are planted on hot-beds under frames, or in pots which are placed in stoves, to come early in the spring, for which purpose they are better adapted than any of the others; but they are inferior to several of the others in point of goodness; though, as they may be had at a time when the others cannot be so well obtained, they are generally cultivated in gardens; and where there are not the conveniences of stoves or frames for raising them very early, they are planted in warm borders, near hedges, walls, or pales, where they will be fit for use a fortnight earlier than the other sorts. The next to these are the Battersea and Canterbury Kidney Beans, which do not ramble far, and, producing their flowers near the root, bear plentifully for some time; the Battersea Bean is the forwarder of the two, but the other will continue bearing much longer; they are both better flavoured than any of the three former sorts, but when they begin to be large, are very stringy and tough. There are two or three sorts of Kidney Beans with erect stalks cultivated. These want no support, as they do not put out any twining stalks; hence they are much cultivated by the gardeners, as also because they produce a great plenty of pods; but they are inferior in goodness to all the other, especially that sort with black and white seeds, the pods of which have a rank flavour, and when boiled become soft and meally; so that it should never be cultivated for the table. The best sorts for culinary purposes are the Scarlet Blossom Bean already noticed, and a white Bean of the same size and shape, which appears to be only a variety of the scarlet, as it differs in no other respect but the colour of the flowers and seeds, being equal in size and flavour. And next to these is the Large Dutch Kidney Bean, which grows as tall as either of these, so must be supported by stakes, otherwise the stalks will trail on the ground and spoil. That with scarlet flowers is of a better quality than this, as well as hardier: and although it will not come up so early as some of the dwarf kinds, yet as it will continue bearing till the frost puts a stop to it in autumn, it is much preferable to either of them; for the pods of this sort when old are seldom stringy, and have a better flavour than the young pods of those sorts, and will boil greener; and where this is sown in the same situation and soil as the Battersea Bean, it will not be a fortnight later. All the sorts are propagated by seeds, which are too tender to be sown in the open air before the middle of April; for if the weather should be cold and wet after they are in the ground, they will soon rot; or if the morning frosts should happen after the plants come up, they will be destroyed; therefore the best way to have early Kidney Beans, where there is no conveniency of frames for raising them, is to sow the seeds in rows pretty close upon a moderate hot-bed, the latter end of March or the beginning of April. If the heat of the bed be sufficient to bring up the plants, it will be enough; this bed should be arched over with hoops, that it may be covered with mats every night, or in bad weather. In this bed the plants may stand till they have put out their trifoliate leaves, then they should be carefully taken up, and transplanted in warm borders near hedges, pales, or walls. If the season proves dry at the time of removing them, the plants should be gently watered to forward their taking root, and afterwards they must be managed in the same way as those which are sown in the full ground. These transplanted Beans will not grow so strong as those which are not removed, nor will they continue so long in bearing, but they will come at least a fortnight earlier than those which are in the full ground. The first crop intended for the full ground, should be put in about the middle of April; but these should have a warm situation and a dry soil, otherwise the seeds will rot in the ground; or if the weather should prove so favourable as to bring up the plants, yet there will be danger of their being killed by morning frosts, which frequently happen in the beginning of May. The second crop, which should be one of the three large sorts last mentioned, should be sown about the middle of May. These will come into bearing before the early kinds are over, and if they be of the scarlet sort, will continue fruitful till the frost destroys the plants in the autumn, and these will be good as long as they last. The manner of planting them is, to draw shallow furrows with a hoe, at about three feet and a half distance from each other, into which you should drop the seeds about two inches asunder; then with the head of a rake draw the earth over them, so as to cover them about an inch deep. If the season be favourable, the plants will begin to appear in about a week's time after sowing, and soon after will raise their heads upright; when the stems are advanced above the ground, you should gently draw a little earth to them, observing to do it when the ground is dry, which will preserve them from being injured by sharp winds; but care must be taken not to draw any of the earth over their seed-leaves, as it would rot them, or at least greatly retard their growth. After this they will require no farther care, but to stick them when the plants begin to run, and to keep them clear from weeds until they produce fruit, when they should be carefully gathered two or three times a week; for if permitted to remain upon the plants a little too long, the plants will be weakened, and the beans spoiled for eating. The large sorts of Kidney Beans must be planted at a greater distance, row from row; for as these grow very tall, if the rows are not at a greater distance, the sun and air will be excluded from the middle rows; therefore they should not be less than four feet distance row from row; and when the plants are about four inches high, the stakes should be thrust into the ground by the side of the plants, to which they will fasten themselves, and climb to the height of eight or ten feet, and bear plenty of fruit from the ground upward. The Dutch and French preserve great quantities of the Large Dutch Beans for winter use, which they stew and make good with gravies and sauces.—There are some persons who raise these Beans in hot-beds, in order to have them early. The only care to be taken in the management of these plants when thus raised, is to allow them room, and give them as much air as convenient when the weather is mild; as also to let them have a moderate heat; for if the bed be over-hot they will either burn or be drawn up so weak as seldom to come to good. The manner of making the hot-bed being the same as for raising Cucumbers, (which see,) need not be repeated here; but observe, when the dung is equally levelled, to lay the earth four or five inches thick, and let the great steam of the bed pass off before you sow the seeds. The time for doing this must be proportioned to the season when you desire to bring your Beans to table; but the surest time for a crop is about the first week in February. The manner of sowing the seeds of these plants is, to let a few rows of them remain ungathered in the height of the season; for if you gather from the plants for some time, and afterwards leave the remaining for seed, their pods will not be near so long and handsome, nor will the seed be so good. In autumn,

when you find they are ripe, if the season be dry, pull up the plants, and spread them abroad to dry; after which you may thresh out the seed, and preserve it in a dry place for use. For forward crops of Dwarf Kidney Beans, the early White and Negro sorts are the best, and bear the longest. For the main crop, the Speckled, Battersea, and Canterbury Dwarfs, are to be preferred, being plentiful bearers, and of long continuance. To secure a regular supply from the middle or end of June to October, they should be sown from the middle of April to the middle or end of July, every fortnight or three weeks. For the first crop the soil must be dry and light, the situation warm and sheltered, the drills drawn north and south. The other crops are better in the open quarters. In dry weather the Beans about to be sown should be soaked some hours in water, or else the drills should be well watered immediately before they are put in. The climbing sorts, or runners, are not fit for early crops, but principally for summer and autumn from July to Michaelmas, or till frosts put an end to them. The first or second week in May is early enough to put in the first crop of these; and the second may be planted any time in June. Two crops will furnish an abundant and constant supply.—To raise Dwarf Kidney Beans by artificial heat, they should be sown in a very moderate hot-bed at the end of March, and planted out when they are an inch or two high, and the weather is favourable, in a warm border. They may be sown on the surface in the hot-bed, or in large pots; but it is best to put them in small pots, three in each pot, because they may be turned out for transplantation, with the ball of earth about their roots, and thus be scarcely sensible of their removal. They must however be gradually inured to bear the open air, by taking off the covering whenever the weather is mild, and exposing them by degrees; refreshing them frequently with water, when they cannot have the benefit of warm showers. After they are transplanted they should be well watered, to settle the earth to their roots; and it will much forward their growth, if they be covered occasionally with hand-glasses when the nights are cold. After all, however, this crop will only come into bearing a fortnight sooner than plants sown in the natural ground.—But to produce Kidney Beans for the table in April and May, or perhaps towards the end of March, they must be raised and continued in a hot-bed, which should be made by the middle or end of February. When the heat and steam is abated, and the bed is covered six or eight inches thick with mould, sow the seeds of one of the small early dwarf sorts in drills fifteen or eighteen inches asunder, an inch deep, and two or three inches apart; give them air, and refresh them with water in fine weather. When they are fully grown, if they press much against the glasses, raise them at bottom to give the plants room to grow freely. They may also be raised on a very hot bed in December or January; and removed when of a proper size into another hot-bed, made as directed for Cucumbers; only the dung need not be so thick, less heat being required. When this bed is of a moderate warmth, lift the plants out of the other with a trowel, leaving as much earth about their roots as you can, and plant them at fourteen inches' distance row from row, and four inches plant from plant. Give them a moderate watering, but afterwards be sparing of water; and shade the beds from noon till the sun is nearly off, giving them air in mild weather. The frames should be two feet high in the back, sloping to fifteen inches in front, and the bed should be four feet broad.—In hot-houses or stoves early Kidney Beans may be had at almost any time with ease, by raising them in pots or long narrow boxes. The best sorts for this purpose are the early white liver-coloured, or speckled dwarfs. The pots or boxes, filled with light rich earth, may be placed upon the top of the wall which surrounds the bark-bed, or upon shelves upon any convenient part of the house. When the seeds begin to sprout, moisten the mould; and when they are grown up, water them frequently, or at least three times a week. Where room is wanting, the seeds may be set in small pots, and transplanted into larger ones for fruiting.

2. Phaseolus Lunatus; *Scimitar-podded Kidney Bean.* Stem twining; legumes scimitar-shaped, somewhat crescent-shaped, even; peduncles many-flowered; flowers yellow, with a spreading green banner of the same colour as the calix. It is eaten in Cochin-china, but is more esteemed for the beauty than the flavour of the seeds. It flowers here in June and July.—Native of the East Indies.

3. Phaseolus Bipunctatus. Stem twining; legumes scimitar shaped, pubescent; seeds with two dots at the hilum or scar.—Native of the Cape.

4. Phaseolus Inamoneus. Stem twining; banner revolute, of the same colour with the calices; root annual. The whole plant is smooth; flowers inelegant, with a concave greenish banner, and long, obtuse, concave wings, stretched out, and whitish, as is the spirally intorted keel.—Native of Africa.

5. Phaseolus Farinosus. Stem twining; peduncles subcapitate; seeds four-cornered-cylindrical, mealy; flowers rose-coloured; seeds downy, appearing as if covered with meal; leaves angular, like those of Ground Ivy.—Native of the East Indies.

6. Phaseolus Trilobum; *Three-lobed Kidney Bean.* Stem half-twining, decumbent, smoothish; leaflets three-lobed; lobes ovate; stipules ovate; legumes cylindrical. This is the same with *Dolichos Trilobus*, which see.

7. Phaseolus Vexillatus; *Sweet-scented Kidney Bean.* Stem twining; peduncles thicker than the petiole, forming a head; wings somewhat sickle-shaped, difform; legumes linear, strict; stipules loose at the base, and bifid; flowers few, sessile, sweet-smelling. This plant is intermediate between this genus and that of *Dolichos*.—Native of the West Indies.

8. Phaseolus Helvolus. Stem twining; flowers in heads; calices bracted; wings expanded, very large; leaflets deltoid, oblong; petioles an inch long.—Native of Carolina.

9. Phaseolus Semierectus; *Dark-red-flowered Kidney Bean.* Stem half-twining; flowers in spikes; calices without bractes; wings expanded, larger; leaflets ovate; stipules somewhat ensiform. It flowers in July.—Native of the West Indies.

10. Phaseolus Alatus. Stem twining; flowers in loose spikes; wings the length of the banner; pedicel slender, very short, purple.—Native of Carolina.

11. Phaseolus Caracalla; *Twisted-flowered Kidney Bean*, or *Snail Flower.* Stem twining; banner and keel spirally convoluted. Perennial. The flowers are produced in slender spikes: they are of a purplish colour, and have an agreeable odour, being succeeded by slender compressed pods, containing several oval compressed seeds.—Native of Brazil.

12. Phaseolus Aconitifolius. Stem twining; leaves subquinquepartite; leaves alternate, smooth, ternate; petioles and nerves at the back hairy; flowers small, with a wide banner disposed in a sort of raceme.—Native of the East Indies.

13. Phaseolus Hirtus. Stem half-twining; legum esround; keel horned to the left; root annual; peduncles axillary, from two to three inches long, hispid in a sort of head, but it rarely happens that more than two of the flowers are fertile. They are of a dirty yellow colour, the upper part especially of the banner being brownish.—Native of Turkey.

14. Phaseolus Tuberosus. Stem scandent; banner revo-

lute; root tuberous, fascicled; flowers wholly yellow, in subterminating racemes.—Native of Cochin-china.

15. Phaseolus Tunkinensis. Stem twining, very much branched; leaflets conical, small, thick; banner revolute, of the same colour with the calix; flowers white, in axillary racemes.—Native of Tonquin, and cultivated in Cochin-china.

** *Upright.*

16. Phaseolus Nanus; *Dwarf Kidney Bean.* Stem upright, even; bractes larger than the calix; legumes pendulous, compressed, wrinkled. This spreads out wide, and supports itself without any prop; flowers white. It is sown in great abundance in the fields of Italy, in the month of May. Retzies remarks, that the character, taken from the relative size of the bractes, is very uncertain; they being in some varieties larger, in others less than the calix.—Native of the East Indies.

17. Phaseolus Radiatus. Stem upright, round; flowers in heads; legumes cylindric, horizontal; leaves ternate, broad lanceolate, hairy; stipules in pairs, acute; petioles long.—Native of Ceylon, Amboyna, China, Cochin-china, and Japan.

18. Phaseolus Max; *Hairy-podded Kidney Bean.* Stem upright, straight, angular, hispid; legumes pendulous, rough-haired; flowers pale, or greenish-yellow; seeds black, variegated with brown, the size of Coriander seed. It flowers in June and July.—Native of India.

19. Phaseolus Mungo; *Hairy-headed Kidney Bean.* Stem flexuose, round, hirsute; legumes in heads, rough-haired. The whole plant is covered with hairiness, of a colour like red wine; seeds many, subovate, brownish green, esculent.—Native of the East Indies, China, and Cochin-china.

20. Phaseolus Lathyroides. Stem upright; leaflets lanceolate; flowers in a sort of spike, alternate, mostly in pairs, close together, blood-red; banner of a paler red; wings deep red, twice as large as the banner; keel whitish.—Native of Jamaica, in moist sandy grounds. It is common in the savannas about Spanish Town.

21. Phaseolus Sphærospermus. Stem upright; seeds globular, dyed at the hilum; corolla white; peduncles axillary, strong, nine inches in length. They are reckoned the sweetest and best food of any of the Kidney Beans.—Native of both Indies.

Pheasant's Eye. See *Adonis.*

Phellandrium; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal, manifold; partial similar: involucre universal, none; partial seven-leaved; leaflets acute, the length of the umbellet; perianth proper, five-toothed, permanent. *Corolla:* universal, almost uniform; florets all fertile in the disk, smaller; proper unequal; petals five, acuminate, cordate, inflex. *Stamina:* filamenta five, capillary, longer than the corolla; antheræ roundish. *Pistil:* germen inferior; styles two, awl-shaped, erect, permanent; stigmas blunt. *Pericarp:* none; fruit ovate, even, crowned with the perianth and pistils, bipartile. *Seeds:* two, ovate, smooth. Essential Character. Florets of the disk smaller; fruit ovate, even, crowned with the perianth and pistil.——The species are,

1. Phellandrium Aquaticum; *Common Water Hemlock.* Ramifications of the leaves divaricated; root biennial; radical fibres abundant, placed in whorls at the lower joints of the stem, which they support by rooting in the mud; stem curved at bottom, and then upright, hollow, and cylindrical, four inches in thickness, smooth, striated, and slightly grooved, branched, distorted, three or four feet in height; corolla small, white; petals little, unequal.—It is a native of most parts of Europe, by the side of rivers, ditches, and ponds, where there is mud; flowering in June and July. Linneus informs us, that the horses in Sweden by eating this plant are seized with a kind of palsy; hence Withering and Sibthorp have named it *Horsebane.* This effect, however, is not to be ascribed to the plant, but to a coleopterous insect breeding in the stalks, which he therefore names *Curculio Paraplecticus.* In the winter, the roots and stem, dissected by the influence of the weather, afford a curious skeleton or network. The leaves of this plant are sometimes added to discutient cataplasms; and for this purpose, Boerhaave speaks highly of it. The seeds are recommended in intermittents, and are said to be diuretic, antiseptic, and expectorant; the dose is from one to three drachms daily. When taken in large doses, they produce a sensation of weight in the head, accompanied with giddiness. They have an aromatic acrid taste, approaching to that of Lovage: distilled with water, they yield an essential oil, of a pale yellow colour, and a strong penetrating smell; one pound of the seeds affords an ounce of watery extract, but nearly double that quantity of spirituous extract, of which more than three drachms consist of resin. The medicinal efficacy of this plant rests chiefly on the testimonies of Ernstingius and Lange, by whom various cases of its successful use are published, especially in wounds and inveterate ulcers, and even in cancers; also in pulmonary consumption, asthma, dyspepsia, and intermittent fevers. Dr. Woodville judiciously observes, that though the disorders above named are so dissimilar, as to afford no satisfactory evidence of the medicinal qualities of these seeds, yet they appear to deserve further investigation.—In running streams the leaves become divided, like those of Ranunculus Aquatilis, in the same situation. Dillenius remarked it between Woodstock and the Duke of Marlborough's bridge at Blenheim, in such abundance as to impede the course of the stream: also in Hackney river.

2. Phellandrium Mutellina; *Mountain Water Hemlock.* Stem almost naked; leaves bipinnate; root thick, branched, the head crowned with bristles; petals commonly purple, unequal. Linneus remarks, that it has the leaves of Chærophyllum; and that the involucrets are of the same length with the umbellets. Scopoli says, that in the Alps it is a small plant, but becomes three times as big in a garden; and has the fruit crowned with a considerable calix, but not with a circle. Haller observes, that it has a very aromatic smell, and that the goodness of the Alpine pastures is inferred from the abundance of this plant. It flowers in August.—Native of Siberia, Austria, Carniola, and Switzerland.

Philadelphus; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four or five parted, acuminate, permanent. *Corolla:* petals four or five, roundish, flat, large, spreading. *Stamina:* filamenta twenty or twenty-five, awl-shaped, the length of the calix; antheræ erect, four-grooved. *Pistil:* germen inferior; style filiform, four or five parted; stigmas simple. *Pericarp:* capsule ovate, acuminate at both ends, naked at the top by the calix being barked, four or five celled, partitions contrary. *Seeds:* numerous, oblong, small, decumbent, arilled, fastened to the thickened edge of the partitions; arils club-shaped, acuminate, toothletted at the base. Essential Character. *Calix:* four or five parted, superior. *Petals:* four or five. *Capsule:* four or five celled, many-seeded.——The species are,

1. Philadelphus Coronarius; *Common Syringa.* Leaves somewhat toothed. This is a shrub that sends up a great number of stalks from the roots, seven or eight feet in height, having a grey bark, and putting forth several short branches from their sides. The flowers come out from the side and at the ends of the branches, in loose bunches, each on a short

pedicel; they are white, and have a strong scent, which at some distance resembles that of Orange flowers; but near, it is too powerful for most persons: they appear at the end of May, and generally continue great part of June. It seldom produces seeds that ripen in this country. There are two varieties worthy of notice: 1. The Dwarf Syringa, which seldom rises above two feet high. The leaves are shorter, more ovate, and little indented on their edges: the flowers come out singly from the side of the branches, and have a double or treble row of petals, of the same size and form as the other, and the flowers have the same scent; but flowering very rarely, it is not much esteemed. 2. The Carolina Syringa, which rises with a shrubby stalk about sixteen feet high, sending out slender branches from the sides, opposite to each other; leaves smooth, shaped like those of the Pear-tree, entire, opposite, on pretty long footstalks. The flowers are produced at the ends of the branches; they are large, but scentless; each has four white oval petals spreading open, and a large calix composed of four acute-pointed leaflets.—The Common Syringa is extremely hardy, and will thrive in almost any soil or situation, but will grow taller in light good ground than in that which is stiff. It is usually propagated by suckers, which are sent from the roots in great plenty: these should be taken from the old plants in autumn, and planted in a nursery, to grow one or two years, till they have obtained strength, and then may be transplanted to the places where they are designed to remain. They are commonly disposed in plantations of flowering shrubs, among others of the same growth, and mix very well with the Lilac, Gelder Rose, and Laburnum; and is particularly valuable from its thriving under the shade of trees, and forming a blockade against low buildings, where persons have no dislike to the powerful odour. It may also be increased by cuttings, planted in October, in a moist shady border; and by layers, from young twigs put into the ground at the beginning of the winter, which will be rooted by the following autumn.—The other species may be increased in the same way, but are too delicate to endure the open air of our fickle climate.

2. Philadelphus Scoparius; *Myrtle-leaved Syringa.* Leaves lanceolate, quite entire, rigid, three-nerved, all the flowers five-cleft; calicine segments coloured, deciduous. Stem arborescent, very much branched, almost upright, full of chinks, ash-coloured.—Native of New Zealand, where the fresh-flowering shoots were used as tea by the sailors in Captain Cook's ship. They supposed it to be serviceable in the sea-scurvy; and at first found the infusion sweetly aromatic and fragrant, though it afterwards became very bitter. It flowers in June and July.

3. Philadelphus Aromaticus; *Sweet-scented Syringa.* Leaves linear-lanceolate, nerveless, quite entire; all the flowers five-cleft; calicine segments coloured, deciduous. It flowers in July and August.—Native of New Zealand.

4. Philadelphus Laniger; *Hoary Syringa.* Leaves oblong, acute, quite entire, pubescent; calices woolly. It flowers in June and July.—Native of New South Wales.

5. Philadelphus Lewisii. Leaves ovate, acute, entire, ciliated at the margin; segments of the calix acute; style of the length of the stamina, trifid; stigmata three.—Grows on the waters of Clarck's river, and flowers in July.

Phillyrea; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, four-toothed, very small, permanent. *Corolla:* one-petalled, funnel-form; tube scarcely any; border four-parted, revolute, acute; segments ovate. *Stamina:* filamenta two, opposite, short; antheræ simple, erect. *Pistil:* germen superior, roundish; style simple, the length of the stamina; stigma thickish. *Pericarp:* berry ovate, globular, two-celled. *Seed:* solitary, flattish on one side, convex on the other, one of them frequently abortive. Essential Character. *Calix:* four-toothed. *Corolla:* four-cleft. *Berry* or *Drupe:* two-celled. *Seeds:* solitary.——The species are,

1. Phillyrea Media; *Lance-leaved Phillyrea.* Leaves oblong, lanceolate, entire, and serrate. This is a bushy smooth shrub, with many straight, roundish, pale brown, leafy, wand-like branches; leaves opposite, on short stalks, of a dull colour, elliptical, with a small point; flowers yellowish white; fruit the size of a small pea, dark purple, bitter and nauseous. There are two varieties, the Privet-leaved, and Olive-leaved; but they are both of humbler growth, seldom more than eight or ten feet high.—This, and the third species, are very proper to intermix with other evergreen trees of the same growth, to form clumps in parks, or to plant round the borders of woods, which are filled with deciduous trees, where in the summer time the dark shade of these evergreens will make a fine contrast with the brighter green leaves of the deciduous trees; and in winter, when the latter are destitute of leaves, they will have a fine effect, besides affording a shelter for the feathered race. They may be trained up to stems, so as to be out of the reach of cattle, and planted in open places, where, if they be fenced against cattle till they have acquired their full growth, they may be afterwards exposed. The other species, which are of humbler growth, must be confined to gardens or other inclosures, where they may be secured from cattle, hares, rabbits, &c. These plants are propagated either from seeds or layers; but the latter being the most expeditious method, is generally preferred. The best time to lay them down is in autumn, when you should dig the ground round the stems of the plants intended to be layed, making it very loose; then making choice of a smooth part of a shoot, make a slip upward, in the same manner as is practised in laying of Carnations, and then bend the branch gently down to the ground, making a hollow place by the hand to receive it; and having placed the part which was slit into the ground, so as that the slit may open, you should fasten it down with a forked stick, that it may remain steady, covering that part of the branch with earth about three inches thick, observing to keep the upper part erect. Keep them clear from weeds the spring and summer following, and in the next autumn most of them will be rooted; they should then be carefully taken off, and planted in a nursery, where they may be trained up for three or four years in the manner you intend them to grow; during which time dig the ground between the rows, and cut about the roots of the plants every year, which will cause them to strike out strong fibres, so as to support a good ball of earth when they are removed. Observe also to support their stems with stakes in order to make them straight, for if neglected they will grow very crooked and unsightly. When the plants have been thus managed three or four years, transplant them into the places where they are designed to remain. The best time for this work is the end of September or the beginning of October; but in removing them, dig round their roots, and cut off all downright or strong roots which have shot out to a great distance, that you may the better preserve a ball of earth to each plant, otherwise they are subject to miscarry; and when you have planted them in their new quarters, lay some mulch upon the surface of the ground, to prevent their drying. Support the plants also with stakes, until they have taken fast hold of the earth, to prevent their being turned out of the ground, or displaced by the winds, which will destroy the

fibres that were nearly put out, and greatly injure the plants. They delight in a middling soil, which is neither too wet nor stiff, nor too dry; though the latter is to be preferred to the former, provided it be fresh. Those sorts which have small leaves are commonly two years before they take root when laid; therefore they should not be disturbed, for the raising them out of the ground greatly retards their rooting.—If they be propagated by seed, it should be sown in autumn after it becomes ripe, for if kept out of the ground till spring, it will not grow till the second year. The seeds will do best if they be sown in pots or boxes filled with light loamy earth, and placed under a garden frame, where they may be screened from hard frost, but always exposed to the open air in mild weather. If the seeds be sown early in the autumn, the plants will appear in the spring; but if they should fail to come up, the pots must be removed into an eastern border, and plunged into the ground, where they may only have the morning sun; and should remain there, during the following summer, but should be constantly weeded, and in the autumn removed again under a frame for shelter in winter; and if the seeds were good, the plants will certainly appear in the following spring. Towards the middle of April, the pots should be again plunged into the ground on an eastern border, to prevent the air from drying the earth through the pots, which generally happens when they stand upon the ground, so that they must then be frequently watered, which should be avoided if possible. The Michaelmas after, the plants ought to be taken out of the pots, and planted in a nursery bed, covering the surface with old tan to keep out the frost; and if the winter be severe, cover them with mats, and afterwards treat them as layers. —They are all hardy enough to thrive in the open air in England, and are never injured except the winters are very severe, which sometimes causes their leaves to fall, and kills a few of the weaker branches, but these are repaired by new shoots in the following summer, so that there are few of the evergreen trees which are hardier than these, or that are more worthy of cultivation. They were formerly planted against walls, to which they were trained, to cover them; or, if they were placed as standards, their branches were sheared either into balls or pyramids, like most of the evergreen trees; so that when the antique taste of laying out gardens was exploded, the evergreens were generally banished, and for some years there were but few sorts cultivated, whereby several valuable kinds of evergreen trees were almost entirely lost in England, and have been with difficulty since retrieved. In the manner in which the evergreen trees and shrubs are now disposed in gardens, they have a very fine effect, especially during the winter season, when the other trees are destitute of leaves.

2. Phillyrea Angustifolia; *Narrow-leaved Phillyrea.* Leaves linear-lanceolate, quite entire; stalk ten or twelve feet high, sending out opposite branches, covered with a brown bark, spotted with white. The flowers come out in large clusters at each joint of the branches, sitting close like whorled flowers, and almost surrounding them; they are small and white.—Native of Italy, Spain, and Portugal.

3. Phillyrea Latifolia; *Broad-leaved Phillyrea.* Leaves ovate-oblong, subcordate, serrate. It sends out several strong branches, which grow erect, and are covered with a gray bark; leaves an inch and half long, and an inch broad, firm, of a lucid green, and serrate, each serrature ending in a spine. There are several varieties: 1. The Smooth Broad-leaved Phillyrea, which rises with a strong upright stem to the height of eighteen or twenty feet, dividing into several branches, covered with a smooth grayish bark; flowers axillary, on each side of an herbaceous white colour, in small clusters; they come out in March, but, being small, do not make a great appearance. 2. Prickly Broad-leaved Phillyrea, with the leaves ovate-oblong, acute, finely serrate, flat. 3. Ilex-leaved Phillyrea. Leaves lanceolate acute, serrate, bent obliquely.—Very abundant in the south of Europe, on open hills.

Philydrum; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* spathe one-leafed, ovate, acuminate, longer than the corolla: perianth none. *Corolla:* petals four, two outer larger, ovate; two inner smaller by half, lanceolate. *Stamina:* filamentum single, free-awl-shaped; antheræ fastened on both sides to the filamentum above the middle; cells subglobular. *Pistil:* germen superior, oblong; style? *Pericarp:* capsule oblong, obsoletely three-sided, three-celled, three-valved; partitions contrary. *Seeds:* very numerous, irregularly shaped like saw-dust. Essential Character. *Spathe:* one-flowered. *Perianth:* none. *Corrolla:* four-petalled, irregular. *Capsule:* three-celled, many-seeded——The only known species is,

1. Philydrum Lanuginosum. Root perennial; stem two feet high, herbaceous, quite simple, spongy, upright, round, woolly; leaves awl-shaped, thick, woolly, upright; racemes long, upright, terminating; flowers peduncled, golden, supported by short, acuminate, hirsute spathes; seeds extremely minute.—Native of wet places in China and Cochin-china.

Phleum; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume one-flowered, two-valved, oblong, linear, compressed, gaping, with two cusps at top; valves straight, concave, compressed, embracing, equal, truncated, mucronated at the top of the keel. *Corolla:* two-valved, shorter than the calix; outer valve embracing the inner, which is smaller; nectary two-leaved; leaflets ovate, concave, acute. *Stamina:* filamenta three, capillary, longer than the calix; antheræ oblong, forked. *Pistil:* germen roundish; styles two, capillary, reflex; stigmas feathered. *Pericarp:* none; the calix and corolla inclosing the seed. *Seed:* single, roundish. Essential Character. *Calix:* two-valved, sessile, linear, truncated, with a two-cusped tip. *Corolla:* inclosed.—For the propagation of this genus, see *Grass.*——The species are,

1. Phleum Pratense; *Meadow Cat's-tail,* or *Timothy Grass.* Spike cylindric; calix ciliate, awned; culm erect; root perennial; leaves lanceolate, pointed, rough on the upper surface and along the nerve; sheath streaked, smooth; spike regularly cylindric, and blunt at the top, sometimes five or six inches long, but usually in its wild state much shorter: at first sight it bears some resemblance to that of Fox-tail Grass, but on examination it will be found very different in form, colour, &c. The flowers are very closely set on the spike; peduncles very short, somewhat branched. This Grass varies much in the size and in the length of the spike; it has also a leafy spike, in common with many other Grasses, occasioned by the seeds germinating in wet weather without failing. A variety with a bulbous root is noted for a distinct species; but this swelling of the root is a very equivocal character among the Grasses. It was much recommended about thirty years ago, under the quaint appellation of *Timothy Grass,* which it is said to have acquired from Mr, Timothy Hanson, who first brought the seeds of it from New York to Carolina. It then had a great character in North America under the name of *Herd Grass.* Its reputation here was, however, but short-lived, as it has not one good quality in which it is not excelled by Fox-tail Grass: but, besides this, it is harsh, and late in its appearance. It

might however answer very well with other coarse grasses, in moist ground, kept very close down by feeding.

2. Phleum Alpinum; *Alpine Cat's-tail Grass.* Spike ovate, cylindrical; awns about as long as the glumes; root perennial, inclined to creeping, and a little tuberous; stem mostly solitary, simple, ascending a foot or more in height, leafy below, naked, smooth, striated, and very straight above.—Native of the mountains of Lapland, Switzerland, &c. In Britain it was first discovered near Garway Moor in Scotland; and probably may be found in similar situations in other parts of our island, since it forms a principal part of the turf in the most elevated pastures of Switzerland. It flowers with us at the end of July.

3. Phleum Gerardi. Spike roundish; glumes ciliate; culm simple; sheaths of the leaves ventricose; root perennial, with an oblong bulb, transverse, and woody as it grows old, rooting deeply, with blackish fibres springing from the lower part of the transverse tuber.—Native of the high mountains of Provence, Italy, Carniola, Syria, and of the Pyrenees.

4. Phleum Nodosum; *Knobbed-rooted Cat's-tail Grass.* Spike cylindrical; culm ascending; leaves oblique; root bulbous. Dr. Withering says there are three or four bulbs on the culm, half an inch asunder, and two lanceolate scales to each bulbous joint.—Found near Bath, on the Warminster road, and in dry hilly pastures in most places.

Phlomis; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, oblong, five-cornered, toothed, permanent; involucre below the whorl. *Corolla:* one-petalled, ringent; tube oblong; upper lip ovate, vaulted, incumbent, compressed, villose, obsoletely bifid; lower lip trifid; the middle segment larger, two-lobed, blunt; the side ones small, more acute. *Stamina:* filamenta four, concealed under the upper lip, of which two are longer; antheræ oblong. *Pistil:* germen four-parted; style the length and situation of the stamina; stigma bifid, acute; the lower cleft longer. *Pericarp:* none; calix containing the seeds at the bottom. *Seeds:* four, oblong, three-sided. *Observe.* It differs from *Leonurus* by the want of points on the antheræ. The figure of the calix and lips of the corolla varies. Essential Character. *Calix:* angular. *Corolla:* upper lip incumbent, compressed, villose.——The species are,

1. Phlomis Fruticosa; *Shrubby Phlomis,* or *Jerusalem Sage.* Leaves roundish, tomentose, crenate; involucres lanceolate; stem shrubby.—Native of the southern parts of Europe, in dry rocky situations, especially near the sea. Mr. Miller divides this and its varieties into three species. The first has a pretty thick shrubby stalk, covered with a loose bark, rising five or six feet in height, and dividing into many irregular branches, which are four-cornered and woolly when young, and afterwards become woody; their joints are pretty far asunder; at each of these are placed two roundish leaves, opposite, on short foot-stalks, they are woolly on their under side; the flowers come out in thick whorls round the stalks, and are yellow; they appear from June to August; but the seeds very rarely ripen here. The second, or narrow-leaved Phlomis, does not rise so high as the other; the branches are weaker; the leaves longer, narrower, and rounder; the whorls of flowers smaller, but the flowers of the same shape and colour. The third, has a shrubby stalk like the first, but seldom rises more than three feet and a half high, sending out branches on every side. Dillenius describes the stems of this species as from a foot to two feet in height, woody, and upright; branches opposite, quadrangular, villose; leaves thick, at first hoary, but afterwards green on the upper surface: those on the flowering branches are green on both sides, on shorter and wider petioles, bluntly notched about the edge, but the notches scarcely visible, especially on the upper ones; the surface wrinkled and hirsute; the twigs on which the flowers grow are commonly curved in, and reclined; whorls on each shoot sometimes two or only one, terminating the uppermost branchlets, composed of several broadish hirsute leaflets, and large flowers of a dusky yellow colour, in a wide head.—This plant was formerly kept in pots, and housed in winter with other exotic plants; but of late years it has been planted in the open air, where it is seldom injured by cold, unless in very severe winters: so it is intermixed with other shrubs of the same growth in shrubberies, where it adds to the variety; for as these shrubs retain their hoary woolly leaves all the year, they make a good appearance in winter; and their yellow flowers, which continue great part of the summer, being intermixed with their hoary leaves, have a good effect. These shrubs should have a dry soil, and a warm sheltered situation, or they will not live in the open air. They may be planted among Cistuses of all the different sorts, the Shrubby Moon Trefoil, Wormwood Tree, and some other exotic shrubs of the same countries, which require a warm situation, and a dry soil, being too tender for open plantations which are exposed to strong cold winds; and as they are not of long duration, they are better when separated from trees and shrubs which continue many years, for they rarely live above twelve or fourteen years in dry ground, and not more than half that time in cold moist land, or where they are not well sheltered They are propagated by parting their roots; or by cuttings, which if planted in a bed of light earth in April, just before the plants begin to shoot, and covered with mats to screen them from the sun every day, as also to observe when the ground is dry to give them water gently, they will get good roots in about two months or ten weeks, when they may be carefully taken up, and transplanted into a nursery to remain one year, and then be transplanted to the places where they are designed to stand, for they will not bear transplanting afterwards.

2. Phlomis Purpurea; *Sharp-leaved Purple Phlomis.* Bractes lanceolate, acute, pungent. Calices five-cornered, acuminate; leaves underneath very closely woolly; stem rather shrubby, erect, branched, slightly quadrangular, covered with thick wool, especially the younger branches; footstalk channelled, very woolly: the wool of the whole plant is formed like stars, as in various species of this genus, and several others. It flowers in June.—Native of Spain. This and the next species may be propagated and treated in the same way as the first, only this is more impatient of cold. Severe frost indeed will destroy both of them in the open border; hence they require some occasional protection, and a plant of each should be kept in the greenhouse to guard against accidents.

3. Phlomis Italica; *Blunt-leaved Purple Phlomis.* Bractes lanceolate, obtuse, unarmed. Calices truncate, pointless; leaves woolly on both sides. This plant is common in our gardens. It flowers from June to August.—Native of Portugal. See the preceding species.

4. Phlomis Nissolii. Root-leaves cordate, sagittate, tomentose, villose on both sides; root perennial, as are also the lower leaves, which do not rise immediately from the root but stand in clusters upon short trailing woolly branches; stalks annual, slender, a foot high; these stalks generally send out two side-branches opposite near the bottom, and from this division, to the top, have thin whorls of yellow flowers, not closely joined together, but each flower stands separate. The flowers appear in June and July, but there

are seldom any seeds produced in England.—It grows naturally in the Archipelago, and also in Spain. This and the next species may each be propagated by slips in the spring. They require a dry soil and warm situation, with the same precautions against frost as the rest.

5. Phlomis Lychnitis; *Sage-leaved Phlomis.* Leaves lanceolate, tomentose; floral leaves ovate; involucres bristle-shaped, woolly. This has the habit of the first species, but the leaves are narrower; the corolla is scarcely bigger than the calix; involucres linear, crinite, with long hairs; root perennial. It flowers from June to August.—Native of the south of France, Italy, and Spain. For its propagation and culture, see the preceding species.

6. Phlomis Laciniata; *Jagged-leaved Phlomis.* Leaves alternately pinnate; leaflets jagged; calices woolly. Root perennial; stalk a foot and a half high, decays in the autumn, but the lower leaves continue all the year; flowers in whorls; calix downy; corolla of a dusky purple colour.—Native of the Levant. It flowers in June, but does not ripen seeds here; and is propagated by offsets from the root, which it sends out very sparingly. Very sharp winters sometimes kill it, and the next species, in open borders.

7. Phlomis Samia. Leaves ovate, tomentose underneath; involucres awl-shaped, strict, three-parted. Stem upright, hirsute, four-cornered, herbaceous; root perennial.—Native of the Isle of Samos, and found also in Barbary. See the preceding species.

8. Phlomis Herba Venti; *Rough-leaved Phlomis.* Involucres bristle-shaped, hispid; leaves ovate-oblong, rugged. Stem herbaceous; root perennial; when large, it sends up a great number of square stalks, covered with a hairy down, and having sessile leaves on them; corolla bright purple. It flowers from July to September.—Native of the south of France, Italy, Persia, and Tartary. It may be increased by parting the roots in autumn, when the stalks begin to decay, that the plants may get root before the frost comes on; but it should not be parted oftener than every third or fourth year, if it be expected to have many flowers. It is hardy, and may be planted in exposed places, but never in moist ground.

9. Phlomis Tuberosa; *Tuberous Phlomis.* Involucres hispid, awl-shaped; leaves cordate, rugged. Stem herbaceous; root tuberous; stalks purple, four-cornered, five or six feet high; flowers of a pale purple colour, and hairy; they appear in June and July, and the seeds ripen in September; soon after which the stalks decay, but the roots will abide many years.—Native of Siberia. Sow the seeds upon an eastern border in the spring, and keep the plant clean from weeds, and in the autumn transplant them where they are to remain: in the following summer it will produce flowers and seeds. It is very hardy, and will thrive in almost any soil or situation.

10. Phlomis Zeylanica; *White Phlomis.* Leaves lanceolate, subserrate; heads terminating; calices eight-toothed. Stem of the same height as in the nineteenth species, upright, herbaceous, four-cornered, blunt; corolla white, upper lip hirsute, very short, vaulted close, entire. It is biennial, flowering from June to October.—Native of the East Indies. This and the eight following species being natives of hot countries, must be kept in the bark-stove. Several of them are annuals, and can only be propagated by seeds procured from the country where they grow.

11. Phlomis Caribæa; *West Indian Phlomis.* Leaves ovate, lanceolate, villose; whorls roundish, very close; involucres bristle-shaped, hirsute. Stem herbaceous; root branching. It is an annual plant, two feet high, upright, and without any scent. It flowers from July to September.—Native of the West Indies. See the preceding species.

12. Phlomis Urticifolia; *Nettle-leaved Phlomis.* Leaves ovate, serrate, canescent; involucres awl-shaped; calices obliquely truncate, membranaceous, nine-toothed. Stem herbaceous, upright, branched, villose when magnified, canescent; whorls many-flowered; flowers small.—Found in the East Indies, and Arabia. See the tenth species.

13. Phlomis Indica; *East Indian Phlomis.* Involucres linear; calices one-lipped, oblique; leaves ovate, hairy; whorls toward the top, two or three, thick, surrounded with erect, linear, keeled, villose involucres. Native of the East Indies. See the tenth species.

14. Phlomis Moluccoides. Leaves ovate; involucres bristle-shaped; the lower lip of the calix rounded, large, membranaceous. This is a shrub with villose branches; whorls remote, fourteen-flowered.—Native of Arabia. See the tenth species.

15. Phlomis Glabrata. Leaves ovate, serrate: lower lip of the calix produced, three-toothed; branches reversely hairy. Stem herbaceous, upright, acutely angular; corolla under the upper segment of the calix, and twice as long; filamenta the same length as the corolla.—Native of Arabia. See the tenth species.

16. Phlomis Alba. Leaves ovate, serrate, villose; calices five-toothed, oblique. Stem herbaceous, smooth, bluntly angular; branches hairy at top; corolla twice as long as the calix.—Native of Arabia. See the tenth species.

17. Phlomis Biflora. Leaves ovate, serrate; calices solitary, opposite, ten-toothed. Stem herbaceous, branched, slender, weak, slightly villose; peduncles very short, solitary, opposite, one-flowered.—Native of the East Indies. See the tenth species.

18. Phlomis Nepetifolia; *Catmint-leaved Phlomis.* Leaves cordate, acute, serrate, subtomentose; calices six or eight toothed, upper and lower tooth larger. Stem herbaceous; whorls few, towards the top, globular, many-flowered, annual. It flowers here in September and October.—Native of the East Indies. See the tenth species.

19. Phlomis Leonurus; *Narrow-leaved Phlomis*, or *Lion's Tail.* Leaves lanceolate, serrate; calices ten-cornered, ten-toothed, pointless. Stem shrubby. This is a very handsome plant when in flower; the corolla is of a tawny or golden colour, and shining like silk. It rises with a shrubby stalk seven or eight feet high, sending out several branches, which are four-cornered; the branches have each two or three sessile whorls of flowers towards the end. There is a variety of it with variegated leaves. It flowers from October to December. Native of the Cape of Good Hope.—This, and the following species, are increased by cuttings planted in July: after the plants have been so long exposed to the open air as to harden the shoots, they will take root very freely. Plant them in a loamy border with an eastern aspect; and if they are covered closely with a bell or hand glass to exclude the air, and are shaded from the sun, it will forward their putting out roots; but when they begin to shoot, raise the glasses to prevent their drawing up weak, and by degrees expose them to the open air. As soon as they have taken good root, take them up, and plant each in a separate pot filled with soft loamy earth, and placed in the shade till the plants have taken new root; then remove them to a sheltered situation, where they may remain till October, when they must be removed into the green-house, and afterwards treated as the Myrtle, and other green-house plants, taking care to water this species plentifully.

20. Phlomis Leonitis; *Dwarf Shrubby Phlomis.* Leaves ovate, blunt, subtomentose, crenate; calices seven-toothed, awned; stem shrubby; branches four-cornered, in pairs; co-

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PENTAPETES PHŒNICEA_

Scarlet-flowered Pentapetes.

PHLOX DIVARICATA_

Early-flowering Lichnidea.

PHLOX MACULATA_

Spotted-stalked Lichnidea.

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rolla neither so long nor so deep-coloured as the preceding. It flowers in June and July.—Native of the Cape. See the preceding species.

21. Phlomis Chinensis. Leaves ovate-serrate, tomentose, silky; calices in whorls, ten-toothed. Stem shrubby, with four-cornered hispid branches; corolla white, with the upper lip compressed, hirsute on the outside.—Native of China.

22. Phlomis Biloba. Leaves ovate-oblong, tomentose, from four to six flowers in a whorl; calices half five-cleft, villose, wool-bearing; upper lip of the corollas two-parted. Stems herbaceous, upright, branched, villose, woolly, with blunt corners; flowers sessile, or on very short pedicels; corolla the size of that in the eighth species, purple, villose, tomentose on the outside. It is a very beautiful species, and quite distinct from the rest.—Native of Algiers.

Phlox; a genus of the class Pentandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, cylindrical, ten-cornered, five-toothed, acute, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindrical, longer than the calix, narrower below, curved in; border flat, five-parted; segments equal, blunt, shorter than the tube. *Stamina:* filamenta five, within the tube of the corolla, two longer, one shorter; antherhæ in the throat of the corolla. *Pistil:* germen conical; style filiform, the length of the stamina; stigma trifid, acute. *Pericarp:* capsule ovate, three-cornered, three-celled, three-valved. *Seeds:* solitary, ovate. Essential Character. *Corolla:* salver-shaped. *Filamenta:* unequal. *Stigma:* trifid. *Calix:* prismatical. *Capsule:* three-celled, one-seeded.—The plants of this genus delight in a moist rich soil, not too stiff, in which they will grow tall, and produce much larger bunches of flowers than in dry ground; for when the soil is poor and dry, they frequently die in summer, unless frequently watered. They are generally propagated by parting their roots, because they do not often produce seeds in England. The best time for this is in autumn, when their stalks begin to decay; these roots should not be divided into small heads, if they are expected to flower well the following summer, nor should they be parted oftener than every other year, because when they are often removed and parted, it will greatly weaken the roots, so that they will send out but few stalks, and those will be so weak as not to rise their usual height, and the bunches of flowers will be much smaller. When the roots are transplanted and parted, it will be a good way to lay some old tan or other mulch upon the surface of the ground about their roots, to prevent the frost from penetrating the ground; for as they will have put out new fibres before winter, the frost when severe often kills the fibres, whereby the plants suffer greatly, and are sometimes destroyed. The first, sixth, and seventh species, propagate pretty fast by their spreading roots, but the others increase but slowly this way; therefore the best method to propagate them is by cuttings, and these, as well as the fourth sort, may be obtained in abundance in that manner. The best time to plant the cuttings is about the end of April or the beginning of May, when the shoots from the roots are about two inches high; these should be cut off close to the ground, and their tops should be shortened; then they must be planted on a border of light loamy earth, and shaded from the sun until they have taken root; or, if they be planted pretty close together, and covered with bell or hand glasses, shading them every day from the sun, they will put out roots in five or six weeks; but when they begin to shoot, the glasses should be gradually raised to admit the free air to them, otherwise they will draw up weak, and soon spoil: as soon as they are well rooted, the glasses should be taken off and the plants inured to the open air; then they should be soon after removed into a bed of good soil; planting them about six inches' distance every way, observing to shade them from the sun, and water them duly till they have taken new root; after which, if they are kept clean from weeds, they will require no other care till autumn, when they should be transplanted into the borders of the flower-garden, where they are designed to remain. If some of the plants be put into pots, and sheltered under a hot-bed frame in winter, they will flower strong the following summer, and these may be placed in court-yards, or other places near the habitation, when they are in beauty, and being mixed with other flowers will be very ornamental.—The species are,

1. Phlox Paniculata; *Panicled Lychnidea.* Leaves lanceolate, flat, rugged at the edge. Stem even; corymbs panicled; segments of the corolla rounded; flowers in a terminating corymb, composed of many smaller bunches, which have each a distinct foot-stalk, and support a great number of flowers of a fine lilac hue, without scent, which stand on short slender pedicels. It is a large lofty plant, requiring frequent supplies of water. It flowers in August and September.—Native of North America.

2. Phlox Undulata; *Waved-leaved Lychnidea.* Leaves oblong, lanceolate, somewhat waved, rugged on the edge. Stem even; corymbs panicled; segments of the corolla somewhat retuse; flowers blue, appearing in July and August.—Native of North America.

3. Phlox Suaveolens; *White-flowered Lychnidea.* Leaves lanceolate all over. Stem very smooth; raceme panicled; flowers white, moderately sweet-scented. It flowers in July and August.—Native of North America.

4. Phlox Maculata; *Spotted-stalked Lychnidea.* Leaves oblong, lanceolate, smooth. Stem somewhat rugged; racemes corymbed. Towards the upper part of the stalks are small branches, opposite, each terminated by a small bunch of flowers; but on the top of the principal stalk is a long loose spike of flowers, composed of small bunches from the axils at each joint; each cluster having one common peduncle, near an inch long, but the pedicels are short. The flowers are of a bright purple colour, and appear late in July; if the season be temperate, or the soil moist, they will continue in beauty a great part of August, but rarely perfect seeds in England.—Native of North America.

5. Phlox Pilosa; *Hairy-leaved Lychnidea.* Leaves lanceolate, villose. Stem upright; corymb terminating; flowers light purple, appearing at the end of June, but seldom are followed by seeds in England.—Native of North America.

6. Phlox Carolina; *Carolina Lychnidea.* Leaves lanceolate, even. Stem rugged; corymbs subfastigiate. This resembles the next species, but the stem is three times as high, and somewhat rugged.—Native of Carolina.

7. Phlox Glaberrima; *Smooth Lychnidea.* Leaves linear-lanceolate, smooth. Stem upright; corymb terminating; tube of the corolla twice the length of the calix; segments of the border roundish, spreading, of a light purple colour. The flowers appear in June, but, unless the season prove warm, are not succeeded by seeds in England.—Native of North America.

8. Phlox Divaricata; *Early-flowering Lychnidea.* Leaves broad-lanceolate, the upper ones alternate. Stem bifid; peduncles in pairs; corollas pale blue, with a crooked tube. Mr. Curtis says it flowers in May with the Yellow Alyssum, but that it is neither of so long duration, nor so ornamental, as some of the other species: and as it seldom exceeds a foot in height, it may on this account be regarded as a suitable rock-plant. It flowers from April to June.—Native of North America.

9. Phlox Ovata; *Ovate-leaved Lychnidea.* Leaves ovate; flowers solitary; stalks two or three, slender, about nine inches high. The flowers come out singly at the top of the stalk, and have very slender tubes, with a border of five roundish spreading segments; they are of a light purple colour, and appear in July, but are not followed by seeds in England.—Native of Maryland, and other parts of North America.

10. Phlox Subulata; *Awl-leaved Lychnidea.* Leaves awl-shaped, hirsute; flowers opposite. If this plant be left to itself, the stems trail on the ground: the young shoots are of a reddish white, and slightly villose; flowers from one to three or four in an umbel, drooping before they expand; calices villose; corolla pale purple or flesh-colour, with an eye of dark but brilliant purple, disposed in a star-like form. The flowers appear at the beginning of May, and are extremely pretty, but delicate, requiring shelter during the period of their flowering, which is shorter than in most of the other species. It should be frequently renewed by cuttings, which strike readily, and may be suffered to grow either in its natural procumbent way, or be made to appear to more advantage by training it to a stick.—Native of Virginia.

11. Phlox Sibirica; *Siberian Lychnidea.* Leaves linear, villose; peduncles in threes. Stem from two inches to a hand in height. From the uppermost axils peduncles from two to four, about an inch long, hirsute, each bearing one purple flower, varying to white, with purple streaks.—Native of Siberia.

12. Phlox Setacea; *Bristle-leaved Lychnidea.* Leaves bristle-shaped, smooth; flowers solitary. The stalks rise to the height of a foot, when supported; but if left to themselves, trail on the ground. Corolla of a beautiful light purple, with a dark eye. The whole of this plant forms a highly ornamental bush of flowers.—Native of Carolina; and, like most of the others, is easily raised from cuttings, which should be struck early in the spring, to make them become flowering plants the next season. To obtain this plant in perfection, it is necessary to renew it yearly; old plants being less productive of flowers, and less perfect in their foliage. In mild winters, like many other plants from Carolina, this will live abroad, but requires the shelter of a frame, rather than more tender treatment, in severe frosts.

13. Phlox Aristata. Plant feeble, erect, viscidulo-pubescent; leaves linear-lanceolate; panicles loose, fastigiated; pedicels subgeminate; segments of the corolla oboval; tube curvated, pubescent; teeth of the calix very long, subulate; flowers red, or sometimes white.—Grows in sandy fields from Pennsylvania to Carolina.

14. Phlox Stolonifera. Plant creeping-stoloniferous, pubescent; radical leaves spathulate-obovate; little stems oval-lanceolate; corymb with few flowers, straggling; segments of the corolla obovate; teeth of the calix linear, reflex; flowers blue, with a purple centre, very handsome.—Grows in the high mountains of Virginia and Carolina.

15. Phlox Pyramidalis. Plant erect, glabrous; stem scabrous; leaves cordate-ovate, acute; segments of the corolla cuneate-truncate; teeth of the calix somewhat erect, lanceolate, acute; flowers beautiful purple.—Grows in mountain meadows from Pennsylvania to Carolina. This plant is named by Walton, *Phlox Carolina.*

16. Phlox Latifolia. Plant erect, glabrous; stem smooth; leaves cordate-ovate; segments of the corolla suborbiculate; teeth of the calix lanceolate, slightly acuminated. Pursh is inclined to think this plant merely a variety of Phlox Pyramidalis.

17. Phlox Speciosa. Plant erect, glabrous, frutescent, very branchy; leaves linear, superior, alternate, dilated at the base; racemes paniculate-corymbose; segments of the corolla cuneate-oblong, emarginate; teeth of the calix subulate, equal to the tube; flowers white, with a red or purple centre, similar to the white variety of Vinca Rosea, the fructifications appearing in such abundance that they cover the whole shrub.—Grows on the plains of Columbia.

Phœnix; a genus of the class Dioecia, order Triandria.—Generic Character. *Male Flowers. Calix:* spathe universal one-valved; spadix branched; perianth three-parted, very small, permanent. *Corolla:* petals three; concave, ovate, somewhat oblong. *Stamina:* filamenta three, very short; antheræ linear, four-cornered, the length of the corolla. *Female Flowers:* on a different plant, or on the same spadix. *Calix* and *Corolla:* as in the male. *Pistil:* germen roundish; style awl-shaped, short; stigma acute. *Pericarp:* drupe ovate, one-celled. *Seed:* single, bony, subovate, with a longitudinal groove. Essential Character. *Calix:* three-parted. *Corolla:* three-petalled. *Male. Stamina:* three. *Female. Pistil:* one. *Drupe:* ovate.—The plants of this genus may be easily produced from the seeds taken out of the fruit, provided they be fresh, sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanner's bark, which should be kept in a moderate temperature of heat, and the earth frequently refreshed with water. When the plants come up, they should be each planted into a separate small pot filled with the same light rich earth, and plunged into a hot-bed again, observing to refresh them with water, and also to admit air to them in proportion to the warmth of the season, and of the bed in which they are placed. During the summer they should remain in the same hot-bed, but in the beginning of August let them have a great share of air, to harden them against the approach of winter; for if they be too much forced, they will be so tender as not to be preserved through the winter without much difficulty, especially if you have not the conveniency of a bark-stove to keep them in. The beginning of October, remove the plants into the stove, placing them where they may have a moderate share of heat, these being somewhat tenderer while young, than after they have acquired some strength; though indeed they may sometimes be preserved alive in a cooler situation, yet their progress would be so much retarded as not to recover their vigour in the succeeding summer. Nor is it worth the trouble of raising these plants from seeds, where a person has not the conveniency of a stove to forward their growth; for where a stove is wanting, they will not grow to any tolerable size in twenty years. When the plants are removed, which should be done once a year, be very careful not to bruise or injure their large roots, but clear off all the small fibres which are inclinable to mouldiness; for if these are left on they will in time decay, and hinder the fresh fibres from coming out, which must greatly retard the growth of the plants. The soil in which they should be placed must be compounded in the following manner: Half of fresh earth taken from a pasture ground, the other half sea-sand and rotten dung or tanner's bark, in equal proportion; these should be carefully mixed, and laid in a heap three or four months at least before it is used, but should be often turned over, to prevent the growth of weeds, and to sweeten the earth. Observe also to allow pots proportioned to the size of the plants; but never let them be too large, which is more injurious than their being too small. During summer let them be frequently refreshed with water, but not in large quantities; in winter also they must be now and then watered, especially if placed in a warm stove, but if not, they will require less water. These

plants are very slow growers even in their native countries, notwithstanding they arrive to a great magnitude; for it has been often observed by the old inhabitants of those countries, that the plants of some of these kinds have not advanced two feet in height in ten years; so that when they are brought into these countries, it cannot be expected they should advance very fast, especially where there is not due care taken to preserve them warm in winter. But however slow of growth these plants are in their native countries, they may be greatly forwarded here by placing the pots in a hot-bed of tanner's bark, which should be renewed as often as necessary, and the plants always preserved therein both winter and summer, observing to shift them into larger pots as they advance in growth.——The species are,

1. Phœnix Dactylifera; *Common Date Palm Tree.* Fronds pinnate; leaves folded together, ensiform. This rises to a great height in the warm countries: the stalks are generally full of rugged knots, which are the vestiges of the decayed leaves, for the trunks of the trees are not solid like other trees; the centre is filled with pith, round which is a tough bark full of strong fibres while young, but as the trees grow old the bark hardens and becomes woody. The leaves of these trees, when grown to a size for bearing fruit, are six or eight feet long, and may be termed branches, for the trees have no other; these have narrow long leaves, or pinnæ, set on alternately their whole length. These trees have male flowers on different plants from those which produce the fruit, and there is a necessity for some of the male trees being planted in their vicinity to render them fruitful. Most of the old authors who have mentioned these trees, affirm, that unless the female or fruit-bearing Palm Trees have the assistance of the male, they are barren: hence in those places where there are no male trees near the female, the inhabitants cut off the bunches of male flowers when they are just opened, and carry them to the female trees, placing them on the branches near the female flowers to impregnate them; which, they all agree, has the desired effect, rendering the trees fruitful, which would otherwise have been barren. Padre Labat, in his account of America, mentions a single tree of this kind, growing near a convent in the island of Martinico, which produced a great quantity of fruit, which came to maturity enough for eating; but as there was no other tree of this kind in the island, they were desirous to propagate it, and accordingly planted great numbers of the stones for several years, but not one of them grew; therefore, after having made several trials without success, they were obliged to send to Africa, where these plants grew in plenty, for some of the fruit, the stones of which they planted, and raised many of the plants. He then conjectures, that the single tree, before mentioned, might be probably so far impregnated by some neighbouring Palm Trees of other species, as to render it capable of ripening the fruit, but not sufficient to make the seeds prolific. The flowers of both sexes come out in very long bunches from the trunk between the leaves, and are covered with a spatha or sheath, which opens and withers; those of the male have six short stamina, with narrow four-cornered antheræ filled with farina. The female flowers have no stamina, but have a roundish germen, which afterwards becomes an oval berry, with a thick pulp inclosing a hard oblong stone, with a deep furrow running longitudinally. The bunches of fruit are sometimes very large. The fruit of this tree makes a great part of the diet of the inhabitants of Arabia and part of Persia. In Upper Egypt many families subsist entirely upon it. They make a conserve of it with sugar, and even grind the hard stones in their hand-mills for their camels. In Barbary they turn handsome beads, for the use of the Roman Catholics, of these stones. The Date is said to strengthen the stomach and intestines, to stop looseness, and promote expectoration, for which purpose it is given in pectoral decoctions. It is also recommended in the piles, given in red wine. The juice of the Date Tree is procured by cutting off the head or crown of the more vigorous plant, and scooping the top of the trunk into the shape of a basin, where the sap in ascending lodges itself, at the rate of three or four quarts a day, during the first week or fortnight; after which the quantity daily diminishes, and at the end of six weeks or two months the tree becomes dry, and serves for timber or fire-wood. This liquor, which has a more luscious sweetness than honey, is of the consistence of a thin syrup, but quickly becomes tart and ropy, acquiring an intoxicating quality, and giving upon distillation an agreeable spirit or *araky*, which is the general name for all hot liquors extracted by the alembic. From the leaves of the tree they make baskets, or bags, in Barbary. In Egypt they make fly-flaps of them, and brushes to cleanse their sofas or cloths. The hard boughs are used as fences to their gardens, and cages to carry their fowls to market. The trunk is split for the same purposes, and is even used in small buildings. It serves likewise for firing. The threads of the web-like integument between the boughs, make ropes, and the rigging of smaller-vessels.

2. Phœnix Farinifera; *Small Date Palm Tree.* Fronds pinnate; leaves narrower, more pointed. The small trunk this has is only about one, or at most two feet high, and so entirely enveloped in the leaves, that it is never seen, the whole appearing like a large round bush.—Native of Coromandel, in dry barren ground, chiefly on sandy lands at a small distance from the sea. It flowers in January and February, and the fruit is ripe in May. The fruit is a single-seeded drupe, the size of a large French bean, of a purple colour: this the natives eat as gathered from the bush, without any preparation. The leaflets are wrought into mats; the common petioles are split into three or four, and used for making ordinary baskets of various kinds: but these are not so proper for this purpose as the Bamboo. The small trunk, when divested of its leaves, and the strong brown fibrous web that surrounds the trunk at their insertions, is generally fifteen or eighteen inches long, and six in diameter at the thickest part; its exterior or woody part consists of white fibres matted together, which envelope a large quantity of a farinaceous substance, used as food by the natives in times of scarcity; but to separate this from the fibres, the trunk is split into six or eight pieces, then dried, beaten in wooden mortars, and afterwards sifted; the rest of the preparation consists in boiling the meal into a thick gruel, or as it is called in India, congee. It seems to be much less nutritive than Sago, and is less palatable, being considerably bitter when boiled; but probably, by more care in the preparation, or by varying the mode, it might be improved.

Loureiro has described a dwarf Phœnix, or Date Palm, which he characterizes by its having six stamina, and a dwarf trunk. It seems in most respects not to differ from that described above from Coromandel.—Native of Cochin-china, on mountains six leagues from Huæa, the capital of Cochin-china, in rocky places near streams.

Phormium; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* petals six, ascending obliquely, converging into a tube, oblong, connate at the base, unequal; three outer acute, more raised on the back; three inner longer, rounded at the top, concave. *Stamina:* filamenta six, filiform, ascending,

longer than the corolla; antheræ erect, subtriquetrous. *Pistil:* germen bluntly three-sided; style filiform, ascending, a little shorter than the stamina; stigma simple. *Pericarp:* capsule oblong, three-sided, the angels grooved, acuminate, three-celled, three-valved. *Seeds:* very many, oblong, compressed. ESSENTIAL CHARACTER. *Calix:* none. *Corolla:* six-petalled, the three inner petals longer. *Capsule:* oblong, three-sided. *Seeds:* oblong, compressed.——The only known species is,

1. Phormium Tenax; *New Zealand Flax Plant.* Leaves many; inflorescence branched; flowers like those of the Hyacinth.—Native of New Zealand, Norfolk Island, and other islands in the Southern Ocean. The inhabitants of New Zealand make a thread from the fibres of the leaves, with which the women weave a variety of fine matting for clothing and other uses. Many other plants of the Liliaceous tribes might be applied to the same purposes: and this is now manufactured in Norfolk Island, where canvass and other coarse linen cloth have been made with the thread.

Phryma; a genus of the class Didynamia, order Gymnospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, cylindric, gibbous above at the base, striated, with a two-lipped mouth; upper lip narrow, longer, with three awl-shaped converging teeth; lower lip blunt, bifid. *Corolla:* one-petalled, ringent; tube the length of the calix; upper lip shorter, subovate, emarginate, straight; lower lip larger, more spreading, trifid, the middle segment more produced. *Stamina:* filamenta four, two on each side the upper ones, shorter; antheræ roundish, converging, in the throat of the corolla. *Pistil:* germen oblong; style filiform, the length of the stamina; stigma blunt. *Pericarp:* none; calix unchanged, grooved, converging. *Seed:* single, oblong, roundish, grooved on one side; Gærtner says, ovate, drawn to a point at top, obscurely five-cornered. ESSENTIAL CHARACTER. *Calix:* two-lipped, five-toothed. *Seed:* one.——The species are,

1. Phryma Leptostachya. Leaves ovate, serrate, petioled; calix one-leafed, five-cleft. Stem a foot high, obtusely quadrangular, smoothish, brachiate; flowers opposite, remote.—Native of North America.

2. Phryma Dehiscens. Calices finally opening longitudinally; stems suffruticose at the base; branches opposite, few, upright; corolla like that of Vervain; border five-cleft, small, almost equal, with rounded segments. This plant is associated with the preceding, till it is better known, though it has a different appearance. Native of the Cape.

Phrynium; a genus of the class Monandria, order Monogynia.—GENERIC CHARACTER. *Calix:* spathes many, acute, imbricate, many-flowered; perianth three-leaved; leaflets awl-shaped, erect, equal. *Corolla:* one-petalled, tubular; border seven-cleft; the three outer segments acute, almost equal, reflex; the four inner obtuse, erect, unequal, nectary long, channelled, erect. The four inner segments belong properly to this. *Stamina:* filamentum one, awl-shaped, short, growing to the side of the nectary at bottom; anther oblong, irregular, emitting little balls of pollen, distinguishable by the naked eye. *Pistil:* germen ovate, three-cornered, inferior; style thick, short, rather longer than the stamen; stigma concave, inclined towards the anther. *Pericarp:* capsule obtusely triangular, three-celled. *Seed:* nuts three, ovate, or smooth. ESSENTIAL CHARACTER. *Calix:* three-leaved. *Corolla:* inner segments four, obtuse, unequal. *Nectary:* tube filiform; border four-parted. *Capsule:* three-celled. *Nuts:* three.——The only known species is,

1. Phrynium Capitatum. Perennial: stemless, five feet high: on four-fifths of it are very straight, round, regular, shining petioles; leaves a foot long, ovate-oblong, sharp, quite entire, flat, obliquely grooved, smooth, coriaceous; flowers white, collected into a large, sessile, hemispherical cyme, bursting out below the middle of the gaping petiole. The germen is commonly abortive.—Native of Malabar, China, and Cochin-china, in shady wet places. The leaves are used for wrapping up cakes, &c. in the oven whence Loureiro's trivial name of Placentaria: when tender, and not yet unfolded, they infuse them in spirit of rice, or sugar diluted with three times its quantity of water, to make vinegar.

Phylica: a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* common receptacle of the fructifications scaly, collecting the flowers into a disk; perianth proper, one-leafed, five-cleft, turbinate; mouth villose, permanent. *Corolla:* none; scalelets five, acuminate, one at the base of each division of the calix, converging. *Stamina:* filamenta five, very small, inserted under the scalelet; antheræ simple. *Pistil:* germen at the bottom of the corolla; style simple; stigma obtuse. *Pericarp:* capsule roundish, three-lobed, three-celled, three-valved, crowned. *Seeds:* solitary, roundish, gibbous on one side, angular on the other. ESSENTIAL CHARACTER. *Perianth:* five-parted, turbinate. *Petals:* none, but five scales defending the stamina. *Capsule:* tricoccous, inferior.—As these shrubs do not produce seeds in England, they are propagated by cuttings, and slips of the young shoots. There are two seasons for planting these; the end of March, before the plants begin to shoot, and the beginning of August. In the first season plant them in pots, and plunge them into a very moderate hot-bed, covering them close with bell or hand glasses, shading them in the middle of the day, and refreshing them gently with water: they will put out roots in two months, then inure them to the open air, and when they have obtained strength, take them carefully out of those pots, and plant each in a separate small pot, filled with soft loamy earth, placing them in a shady situation until they have taken new root; when they may be removed to a more sheltered place, there to remain till autumn. In the second season, plant the cuttings in pots, which may be either plunged into an old hot-bed or in the ground, covering them close as before, and treating them in the same way: when they put out roots, it will be too late to transplant them, and they must remain in the same pots until spring. If these are placed under a hot-bed frame in autumn, where they may be protected from frost, and exposed to the open air in mild weather, they will succeed better than when they are more tenderly treated. As these shrubs are too tender to thrive in the open air in England, they must be kept in pots, and housed in winter, but they require no artificial heat. In summer they may be placed abroad in a sheltered situation. As they flower in winter, they make a good appearance in the greenhouse or dry-stove at that season. The first sort will live through the winter, when mild, in a warm sheltered situation, but always dies in severe frost.——The species are,

1. Phylica Ericoides; *Heath-leaved Phylica.* Leaves linear, in whorls; they are about half an inch long, bright green, and somewhat hairy. This is a low bushy plant, seldom rising more than three feet high; the stalks are shrubby and irregular, dividing into many spreading branches, subdividing into smaller ones. At the end of the very shoot, the flowers are produced in small clusters, sitting close to the leaves; they are of a pure white, begin to appear in the autumn, continue in beauty all the winter, and decay in spring. The flowers are slightly odoriferous.—Native of the Cape.

2. Phylica Lanceolata; *Lance-leaved Phylica.* Leaves scattered, lanceolate, tomentose underneath; heads terminating, hirsute.—Native of the Cape.

3. Phylica Bicolor; *Two-coloured Phylica.* Leaves linear, pubescent; common calices shorter than the corolla. Stem determinately branched; branches rod-like, rufescent, white, pubescent.—Native of the Cape.

4. Phylica Capitata; *Downy Phylica.* Leaves linear-lanceolate, villose; bractes woolly; heads terminating. It flowers from February to April.—Native of the Cape.

5. Phylica Eriophoros; *Pale-flowered Phylica.* Leaves linear, somewhat hairy, tomentose underneath, rolled back at the edge; heads terminating; flowers tomentose. It flowers in November.—Native of the Cape.

6. Phylica Plumosa; *Woolly-leaved Phylica.* Leaves linear, awl-shaped; the uppermost hirsute. This has an erect shrubby stalk, which rises near three feet high, covered with a purplish bark, and here and there some white down upon it; flowers collected in small heads at the ends of the branches, white, woolly, fringed on their borders, cut into six acute segments at top. It flowers from March to May.—Native of the Cape.

7. Phylica Villosa; *Villose-leaved Phylica.* Leaves linear, the upper ones villose; flowers in racemes.—Native of the Cape.

8. Phylica Imberbis; *Beardless Phylica.* Leaves linear, obtuse, rugged; flowers terminating, pubescent.—Native of the Cape.

9. Phylica Stipularis; *Stipuled Phylica.* Leaves linear, stipuled; flowers five-horned. Stem proliferous, naked, or somewhat rugged from the fallen leaves; heads of flowers with a many-leaved calix of naked, obovate, two-parted scales, interwoven with wool.—Native of the Cape.

10. Phylica Pinifolia; *Pine-leaved Phylica.* Leaves acerose, flat on both sides, very smooth; flowers panicle-racemed. It is a fathom high, and remarkable for its smoothness, and flat fir-like leaves.—Native of lofty mountains at the Cape.

11. Phylica Cordata; *Heart-leaved Phylica.* Leaves cordate, ovate, spreading; stem proliferous.—Native of the Cape.

12. Phylica Dioica; *Diœcous Phylica.* Leaves cordate; flowers diœcous; corolla with white hair.—Native of the Cape.

13. Phylica Buxifolia; *Box-leaved Phylica.* Leaves ovate, scattered, and by threes, tomentose underneath. This rises with a shrubby erect stalk five or six feet high, when old covered with a rough purplish bark, but the younger branches have a woolly down. The flowers are collected in small heads at the ends of the branches; they are of an herbaceous colour, and make no great appearance. It flowers during a great part of the year.—Native of the Cape.

14. Phylica Spicata; *Spiked Phylica.* Leaves oblong, cordate, acuminate, tomentose underneath; spikes cylindrical; flowers the length of the bractes. This species differs from all the rest by its inflorescence, or head of flowers, elongated into a villose spike. It flowers in November and December.—Native of the Cape.

15. Phylica Callosa; *Callous-leaved Phylica.* Leaves oblong, cordate, acuminate, hairy, tomentose underneath; flowers in a sort of head. This is very distinct from the eleventh species, with which it agrees in the form of the leaves. It flowers in March and April.—Native of the Cape.

16. Phylica Paniculata; *Panicled Phylica.* Leaves ovate, mucronate, smooth above, shining, tomentose underneath; racemes leafy, panicled. This approaches to the eleventh species, but differs from it in not having the leaves rugged above, and the flowers racemed and panicled.—Native of the Cape.

17. Phylica Imbricata; *Imbricate Phylica.* Leaves cordate, ovate, smooth; flowers in racemes.—Native of the Cape.

18. Phylica Racemosa; *Recemed Phylica.* Leaves ovate, smooth; flowers simple; panicle racemed. Stem five feet high, shrubby, with determinate branches. It is doubtful whether this plant does not form a distinct genus.—Native of the Cape.

19. Phylica Parviflora; *Small-floweved Phylica.* Leaves awl-shaped, acute, rugged, somewhat hairy; branches panicle many-flowered. This shrub grows to the height of two feet, and is very like the first species; but the branches are many-flowered, and the flowers smaller.—Native of the Cape.

20. Phylica Secunda. Leaves linear, mucronate, smooth; heads terminating, hirsute.—Native of the Cape.

Phyllachne; a genus of the class Diœcia, order Monandria; or of the class Gynandria, order Diandria.—Generic Character. *Male Flowers. Calix:* perianth three-leaved, superior; leaflets very small, awl-shaped. *Corolla:* one-petalled; tube gradually widening and spreading; border five-cleft, spreading; segments oblong, blunt, the length of the tube. *Stamina:* filamentum single, capillary, erect, the length of the corolla, with a gland on each side at the base; antheræ globular, three-grooved. *Pistil:* rudiment of a germen; style and stigma none. *Female Flowers,* on a different plant. *Calix* and *Corolla:* as in the male. *Pistil:* germen turbinate, inferior; style filiform, straight, the length of the corolla, with a gland on each side of the base: stigma capitate, four-cornered, with four tubercles, the two upper ones larger. *Pericarp:* berry inferior, one-celled, many-seeded. *Seeds:* numerous, ovate-oblong, very small, fastened to the receptacle. Essential Character. *Male. Calix:* three-leaved, superior. *Corolla:* funnel-form. *Female. Stigma:* four-cornered. *Capsule:* inferior, many-seeded. ——The only known species is,

1. Phyllachne Uliginosa. Leaves small, awl-shaped, crenulate, with a cartilaginous margin; stems closely approximating, covered with imbricate leaves, proliferous into two or three branchlets; flowers terminating, sessile, white. It is a pretty plant, having the structure of a Moss all over, but adorned with flowers of a very different kind.—Native of Terra del Fuego.

Phyllanthus; a genus of the class Monœcia, order, Monadelphia.—Generic Character. *Males. Calix:* perianth one-leafed, six-parted, bell-shaped, coloured; segments ovate, spreading, blunt, permanent. *Corolla:* none, except the calix be called so. *Stamina:* filamenta three, shorter than the calix, approximating at the base, distant at the tips; antheræ three, two-lobed. *Females. Calix:* perianth as in the males. *Corolla:* none; nectary a rim of twelve angles, surrounding the germen. *Pistil:* germen roundish, obtusely three-cornered; styles three, spreading, bifid; stigmas blunt. *Pericarp:* capsule roundish, three-grooved, three-celled; cells bivalve. *Seeds:* solitary, roundish. Essential Character. *Male. Calix:* six-parted, bell-shaped. *Corolla:* none. *Female. Calix:* six-parted. *Petals:* none. *Styles:* three, bifid. *Capsule:* three-celled. *Seeds:* solitary.—These plants may be propagated by seeds, when they can be procured from the countries where they grow naturally. They must be sown on a hot-bed, and when the plants are sufficiently grown up, each should be planted in a small pot filled with light earth, and plunged into a hot-bed of tanner's bark; shading and watering them until they have taken good root: after this, they must remain constantly in the bark-stove, and be treated in the same manner with plants from hot countries. They may sometimes be raised by planting out slips, or by layers, managed in the same way as those from seeds.——The species are,

1. Phyllanthus Grandifolia; *Great-leaved Phyllanthus.*

Leaves ovate, blunt, quite entire; stem arboreous.—Native of America.

2. Phyllanthus Nutans; *Pendulous-flowered Phyllanthus.* Shrubby; leaves alternate, oval, glaucous underneath; racemes terminating, leafy, nodding; branches slender, covered with a light-coloured reddish-brown smooth bark, divided into twigs set with leaves.—Native of Jamaica.

3. Phyllanthus Mimosoides; *Mimosa-like Phyllanthus.* Stem shrubby; branches rod-like; leaves pinnate, floriferous.—Native of Antigua.

4. Phyllanthus Conami. Stem shrubby, very much branched; branches diffused; leaves petioled, roundish, attenuated, but bluntish at the tip; peduncles fascicled, axillary.—Native of the West Indies.

5. Phyllanthus Niruri; *Annual Phyllanthus.* Leaves pinnate, floriferous; flowers peduncled. Root filiform, long, white; stem about a foot high, branched, erect, herbaceous, roundish, even; flowers on very short peduncles, axillary, nodding, under the leaves. The seeds ripen in succession, and are cast out of the capsules when ripe, with so much force as to be thrown to a considerable distance.—It is very common in Barbadoes; in the mountainous swamps of Jamaica; on the banks of rivers in Hispaniola; and in the East Indies.

6. Phyllanthus Urinaria. Leaves pinnate, floriferous; flowers sessile; stem herbaceous, procumbent. It has its trivial name from its diuretic quality. The whole herb is milky.—It is a native of the East Indies, China about Canton, Cochin-china, and the eastern coast of Africa.

7. Phyllanthus Bacciformis. Leaves pinnate, with six leaflets; female flower terminating; male flowers three together, lower; stem half a foot high, quite simple, ascending, angular, even, annual.—Native of Tranquebar.

8. Phyllanthus Racemosus. Leaves pinnate, flowering in a raceme at the tip; fruit berried, juiceless; stem suffruticose.—Native of Ceylon.

9. Phyllanthus Emblica; *Shrubby Phyllanthus.* Leaves pinnate, floriferous; stem arboreous; fruit berried. This rises in Malabar with a tree-like stem, to the height of twelve or fourteen feet, but in England to not more than half that height, sending out from the side many patulous branches.—Native of the East Indies, Cochin-china, and China; in the last of which the berry is juiceless.

10. Phyllanthus Maderaspatensis. Leaves alternate, wedge-shaped, mucronate. The cocculi are papery, not separating from the epidermis, two-valved, opening with a spring.—Native of the East Indies.

11. Phyllanthus Virgata. Leaves simple, alternate, linear, mucronate; peduncles axillary, solitary, one-flowered; stem shrubby.—Native of the Society Islands.

Phyllis: a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel none, but a panicle; perianth very small, superior, two-leaved, obsolete. *Corolla:* petals five, lanceolate, obtuse, revolute, scarcely connected at the base. *Stamina:* filamenta five, shorter than the corolla, capillary, flaccid; antheræ simple, oblong. *Pistil:* germen inferior; style none; stigmas two, awl-shaped, pubescent, reflex. *Pericarp:* none; fruit turbinate, oblong, blunt, angular. *Seeds:* two, parallel, convex and angular on one side, flat on the other, wider at top. *Observe.* Stigmas as in the Grasses, Elm, and Tetragonia. Essential Character. *Stigmas:* hispid. *Fructifications:* scattered. *Calix:* two-leaved, obsolete. *Corolla:* five-petalled. *Seeds:* two.——The only known species is,

1. Phyllis Nobla; *Bastard Hare's Ear.* Stipules toothed. This plant rises with a soft shrubby stalk about two or three feet high, and is seldom thicker than a man's finger, of an herbaceous colour, and full of joints. It sends out several small side branches towards the top, garnished with spear-shaped leaves nearly four inches long, and almost two broad in the middle, drawing to a point at each end. The flowers are produced at the ends of the branches in loose panicles; they are small, of an herbaceous colour at their first appearance, but, before they fade, change to a brown, or worn-out purple. Native of the Canary Islands.—It is propagated by seeds, which must be sown on a bed of fresh light earth towards the end of March, and the plants will come up by the beginning of May; when they are fit to transplant, they should be put into separate pots, and placed in a shady situation until they have taken root; after which they should be removed into a sheltered situation, where they may have the morning sun: in summer they require frequent watering; in winter they must be sheltered from the frost, but require to have as much free air as possible in mild weather: the second year the plants will flower; if therefore in the spring some of the plants are shaken out of the pots, and put into the full ground, they will perfect their seeds much better than those which remain in the pots. They may also be raised by cuttings planted out in the summer. As these plants seldom continue in health above four or five years, it will be proper to raise a supply of young plants to succeed them. The plants retain their leaves all the year, which being large, and of a shining green, make a handsome appearance in winter; which is its chief use, as the flowers are of no value.

Physalis; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, ventricose, half five-cleft, small, five-cornered, with acuminate segments, permanent. *Corolla:* one-petalled, wheel-shaped; tube very short; borders half five-cleft, large, plaited; segments wide, acute. *Stamina:* filamenta five, awl-shaped, very small, converging; antheræ erect, converging. *Pistil:* germen roundish; style filiform, generally longer than the stamina; stigma blunt. *Pericarp:* berry subglobular, two-celled, small, within a very large, inflated, closed, five-cornered, coloured calix; receptacle kidney-form, doubled. *Seeds:* very many, kidney-form, comprest. Essential Character. *Corolla:* wheel-shaped. *Stamina:* converging. *Berry:* within an inflated calix, two-celled.——The species are,

* *Perennial.*

1. Physalis Somnifera; *Clustered Winter-cherry.* Stem shrubby; branches straight; flowers clustered; leaves ovate-lanceolate, almost three inches long, and an inch and half broad in the middle, downy, and on short petioles; flowers small, of an herbaceous white colour, sitting very close to the branches, and succeeded by small berries, nearly of the same size as the Common Winter-cherry, and red when ripe. It flowers in July and August.—Native of Spain, Sicily, Candia, Barbary, and Zanguebar on the coast of Africa, and of Mexico in America.—Sow the seeds on a bed of light earth in the beginning of April: when the plants are two or three inches high, take them up carefully, and plant each in a small pot filled with kitchen-garden mould, placing them in the shade till they have taken new root; then remove them to a sheltered situation till the beginning of October, at which time remove them into the green-house, watering them sparingly in winter. They will continue several years, if not too tenderly treated.

2. Physalis Aristata; *Bearded Winter-cherry.* Stem shrubby; leaves oblong, entire, smooth; branches, petioles, and peduncles, lanuginose; calicine toothlets awned.—Native of the Canary Islands.

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PHYTOLACCA ICOSANDRA — *Red Phytolacca.*

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PHYSALIS PENSYLVANICA —
Pensylvanian Winter Cherry.

PLANTAGO ALISMA — *Great Water Plantain*

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3. Physalis Flexuosa. Stem shrubby; branches flexuose; flowers clustered. This has the habit and stature of the first species; flowers in like manner scattered at the axils of the leaves; the calices also grow out and involve the berry; but it differs manifestly in having the flowers smaller, the branches very flexuose, and hence the leaves, disposed as it were in a double row, are inserted into the outer angle of the flexure.—Native of the East Indies. Sow the seeds on a moderate hot-bed, and when the plants have four leaves, transplant them on a fresh hot-bed, shading them till they have taken new root; then admit fresh air to them every day in warm weather. When they are three or four inches high, take them up carefully, and plant each in a small pot filled with light loamy earth, placing them in a frame upon an old hot-bed, and shading them until they have taken new root; then gradually inure them to the open air, into which they may be removed in July; and being placed in a warm situation, they may remain there till the end of September. The first winter, place them in a moderate stove; but after that, a green-house will afford sufficient protection.

4. Physalis Arborescens. Stem shrubby; leaves ovate, hairy; flowers solitary; corollas revolute; berries small, spherical, red, inclosed in an oval dark purple bladder. It flowers in June and July, but does not perfect its berries except in warm seasons.—Native of Campeachy. Sow the seeds in the same manner, and treat the plants as directed for the preceding; except that not being so hardy, they must be kept in a moderate stove in winter; but in the middle of summer they should be placed in the open air, in a sheltered situation, for about three months; for if constantly kept in the stove, they will draw up weak, and not flower. It may also be increased by cuttings, planted in pots during the spring and summer months, and plunged into a gentle hot-bed.

5. Physalis Curassavica; *Curassavian Winter Cherry.* Stem shrubby; leaves ovate, tomentose; root perennial, creeping.—Native of Curacao in the West Indies. Part the roots of this and the seventh species in the spring: place the plants under a hot-bed frame, or other moderate warmth, in winter; and during the months of July, August, and September, in a warm situation in the open air.

6. Physalis Tomentosa; *Downy Winter Cherry.* Stem shrubby, tomentose; leaves elliptic, oblong, tomentose; flowers lateral, aggregate.—Native of the Cape.

7. Physalis Viscosa; *Clammy Winter Cherry.* Leaves in pairs, repand, blunt, subtomentose. Stem herbaceous, panicled at top; root creeping, sending up a great number of smooth stalks, about a foot high, dividing towards the top into small spreading branches; flowers towards the top axillary, on long slender peduncles, of a dirty yellow colour with purple bottoms. They appear in June and July, and are succeeded by viscous berries, of an herbaceous yellow colour, inclosed in a light green swelling bladder.—Native of America. See the fifth species.

8. Physalis Pennsylvanica; *Pennsylvanian Winter Cherry.* Leaves ovate, subrepand, blunt, almost naked; flowers in pairs. Stem herbaceous; root not creeping. It flowers from July to September.—Native of North America. Sow the seeds upon a warm border at the end of March; when the plants come up, thin them where they are too close, and keep them clean from weeds till autumn, when they should be transplanted to the places where they are to remain, which ought to be in a warm situation, where they will survive the winter in mild seasons.

9. Physalis Alkekengi; *Common Winter Cherry.* Leaves in pairs, entire, acute. Stem herbaceous, somewhat branched at bottom. Roots perennial, and creeping to a great distance: they shoot up many stalks in the spring, which are a foot high, or more. Flowers axillary, on slender peduncles, white, appearing in July.—Native of the south of Europe, Germany, China, and Cochin-china. The berries of this plant were known to the ancients; they have an acidulous and not unpleasant taste, followed by a slight bitterness, which they are said to derive from the investing calix. Though esteemed detergent and aperient, their fruit is chiefly recommended as a diuretic in suppression of urine, and for removing obstructions arising from gravel or mucus. From six to twelve cherries, or an ounce of the expressed juice, is given as a dose: there seems however to be no danger from a much larger quantity; for in some parts of Germany the country people eat them by handfuls, and in Spain and Switzerland they frequently supply the place of other eatable fruits. Ray says, that a gouty person prevented the returns of the disorder by taking eight of these berries at each change of the moon. Instances of their good effects in dropsical and calculous complaints are on record, but they are very little regarded.—This plant is easily propagated either by seeds or by parting the roots; the latter being the most expeditious method, is generally practised, any time after the stalks decay, till they begin to shoot in the spring; it loves a shady situation, and should be confined, otherwise the roots will ramble to a great distance. Its only beauty is in autumn, when the plants are ripe.

10. Physalis Peruviana; *Peruvian Winter Cherry.* Pubescent: leaves cordate, quite entire. Stem in the stove perennial, lofty, divaricating, very finely pubescent, and extremely soft, as are also the leaves; flowers solitary, pendulous, yellow, with five dusky spots at bottom, visible at both sides, and the throat hirsute. It flowers from April to October.—Native of South America.

11. Physalis Lanceolata. Leaves two together, oval-lanceolate, somewhat entire. Stem herbaceous, dichotomous; calix villose.—Grows in Lower Carolina.

12. Physalis Philadelphica. Leaves ovate, repand-dentate, glabrous. Stem herbaceous, very branchy; peduncles solitary, much shorter than the petiole; flowers yellow, with brown stripes.—Grows in dry places on river sides from New England to Virginia.

** *Annual.*

13. Physalis Angulata: *Tooth-leaved Winter Cherry.* Very much branched: branches angular, smooth; leaves ovate, toothed. This seldom rises to a foot in height; flowers small, on short peduncles.—Native of both Indies, Cochin-china, and Japan. This, like the other annual sorts, is propagated by seeds sown on a moderate hot-bed, and when the plants come up and are a little advanced, they should be planted on a fresh-hot bed to bring them forward and treated in the same way as Capsicum. When they are grown strong, and are hardened to bear the open air, they may be transplanted with balls of earth to their roots into a warm border, observing to shade and water them till they have taken root, after which they will require no other care but to keep them clean from weeds.

14. Physalis Pubescens; *Woolly Winter Cherry.* Very much branched: leaves villose-viscid, cordate; flowers pendulous; fruiting calices roundish-globular, angular. This branches out very wide close to the ground, and the branches frequently lie upon it; they are angular, and full of joints, dividing again into smaller branches; flowers produced on the side of the branches, upon short slender nodding peduncles; they are of an herbaceous yellow colour, with dark bottoms, and are succeeded by large swelling bladders, of a

light green, inclosing berries as large as common cherries, which are yellowish when ripe. It flowers in July, and the berries ripen in autumn.—Native of America, especially Virginia; also of Cochin-china, the Cape, and Port Jackson, New South Wales. If the seeds be permitted to scatter, the plants will come up in the spring, and require no other care but to thin them, and keep them clean from weeds: or, if the seeds be sown in the spring on a common border, the plants will rise very well, and need no further care.

15. Physalis Prostrata; *Trailing Blue-flowered Winter Cherry.* Very much branched; stem procumbent, round, hirsute; leaves somewhat fleshy; flowers axillary, solitary, or in pairs, peduncled, fragrant, fugacious, an inch in width; corollas violet, with a whitish eye, and radiating lines of a darker violet.—Native of Peru.

16. Physalis Barbadensis; *Barbadoes Winter Cherry.* Very much branched: leaves ovate-cordate, pubescent; flowers pendulous; fruiting calices ovate, acuminate, angular; corolla yellow, with purple spots and antheræ. Its purple antheræ, unclammy leaves, want of hoariness, flowering peduncles, nodding, and not very long, distinguish this from the seventeenth species.—Native of Barbadoes.

17. Physalis Chenopodifolia; *Goosefoot-leaved Winter Cherry.* Very much branched: leaves smooth, ovate, acuminate, angular, toothed; calices even, the size of the fruit, globular. This is sufficiently distinguished from the other species by the berries being of the same size as the calix.—Native place unknown.

18. Physalis Minima; *Small Winter Cherry.* Very much branched; fruiting peduncles longer than the villose leaf. This is a small spreading plant, with oblong hairs at the axils of the branches.—Native of the East Indies; flowering in July and August.

19. Physalis Pruinosa; *Hairy Annual Winter Cherry.* Very much branched; leaves villose; peduncles strict. This has the appearance of the ninth, tenth, and eleventh species; but the antheræ are yellow, not blue. It flowers in July and August.—Native of America.

20. Physalis Virginiana. Stem herbaceous; leaves ovate-lanceolate, acutely toothed; root perennial, composed of strong fibres, from which arise two or three hairy stalks nine or ten inches high, dividing into several branches. The flowers come out at the side of the branches, at the base of the petioles, which are long and slender.—Native of Virginia and Vera Cruz.

21. Physalis Patula. Very much branched, patulous: branches angular, smooth; leaves lanceolate, pinnate-toothed. This is a low annual plant; flowers small, white; fruit small, yellowish when ripe.—Native of Vera Cruz.

22. Physalis Villosa. Very much branched: branches villose; leaves ovate, acuminate, serrate-toothed. This is an annual plant; flowers small, of a pale yellow colour; fruit round, as large as a cherry, and of a yellowish green when ripe.—Native of Vera Cruz.

23. Physalis Cordata. Stem erect, branched; leaves ovate, serrate, toothed; petioles and peduncles very long. This is an annual plant, nearly two feet high. The leaves change to a purplish colour in the autumn; flowers small and white; berries almost as large as Heart Cherries, and of that shape, yellowish green, with some purple stripes.—Native of Vera Cruz.

24. Physalis Maxima. Stem erect, branched; leaves ovate-lanceolate, viscid; fruit very large, heart-shaped. Annual: flowers small, pale yellow; fruit pale yellow when ripe.—Native of Vera Cruz.

25. Physalis Parviflora; *Small-flowered Winter Cherry.* Stem angular, diffuse; branches wavy; leaves ovate, downy, nearly entire.—Found in the tropical parts of New Holland.

26. Physalis Obscura. Leaves as if cordate-suborbiculate, acuminate, unequally dentated; stem herbaceous, divaricate, very branchy; branches angulated; flowers yellow, with brown spots and bluish anthers.—Grows in the sandy fields of Lower Carolina.

Physic Nut. See *Jatropa.*

Physiology of Plants.—In addition to what has been said upon this interesting subject in the Introduction to this Work, we have the pleasure here to subjoin, for the satisfaction of our intelligent readers, the entirely new system of Vegetable Physiology, lately translated from the German of the celebrated Willdenow.—"Besides the division into the three kingdoms of nature, natural bodies may be conveniently arranged into two great classes, viz. *organic* and *inorganic* bodies. *Inorganic* bodies are those which are composed of heterogeneous particles, chemically or mechanically combined, and which, even when somewhat regular in their figure, are formed by external apposition. *Organic* bodies, on the contrary, are those which are regularly composed of many differently formed organs, which, in the natural and healthy state, have the same structure with all the individuals of the same species. They grow larger in outward appearance by the action of an internal power, have a circulation of juices, and propagate their kind, so that they are continually reappearing in the same form that has been once prescribed to them. Under organic bodies are comprehended animals and plants. The formation of organic bodies depends upon the diversity of matter and form. In every investigation, these are the last points which occur to us, until we resolve them into their first principles. Vital power or irritability is a property of organized bodies, which is connected with their composition and form; but we are still unable precisely to determine, whether it is merely the result of form and composition, or whether it constitutes an independent power: experience, at least, in the vegetable world, seems to favour the former supposition. The elements, and the matter compounded from them, act upon organized bodies, and afford a stimulus, by which activity or excitation is produced. By the increase and continuance of the stimulus, the irritability diminishes, and at last altogether subsides. Thus the same stimulus, that roused the irritable principle to action, promotes the decay of the organized body: consequently life is an exertion of vital power, by which a supply and combination of the matter belonging to the composition of the organized body, is constantly produced. By life, organized bodies are formed, increased, and supported, and by it the parts which have been injured by accident are restored. The faculty of assimulation of the power of locomotion, and of reproduction, are therefore only consequences of life; just as elasticity and contractility are properties of matter alone. Combinations of matter in organized bodies, in consequence of the irritable principle, are regulated by other laws than those of chemical affinity; and when the vital power ceases, they are destroyed; *i. e.* when the vital power ceases, the matter, of which organic bodies are composed, is combined according to the laws to which inorganic bodies are subject. Elasticity, which is peculiar to the matter of organized bodies, appears both in the living and decayed state of vegetables. It is perceptible in the ligneous fibre, in resins, and other parts and productions of plants. Contractility, is chiefly peculiar to wood. In economical use, the expansion and contraction of wood are very troublesome properties, which can be destroyed only by a particular mode of treatment. The dry stalks of Anasta-

tica *Hierochuntica*, commonly called the Rose of Jericho, the seed-vessels of the genus Mesembryanthemum, many species of which are known to gardeners by the name of the Candian Flower, the dry calix of Carlina *vulgaris*, are in this respect the same as wood. They expand in wet weather, and contract when dry. The same observation applies to Liverworts and Mosses, which during summer appear to be withered, but in cool moist weather, and in autumn, again begin to grow and expand. The contractility of ligneous fibres fits them for being Hygrometers. Formerly it was thought that plants could grow in breadth, only by the expansion of the interstices between the fibres of the wood when moisture pervades them. Mr. De Luc, however, has shown, that the fibres themselves may be elongated, though in a small degree, and may again contract. And he has made the singular remark, that box-wood contracts its fibres longitudinally when moist, but elongates them in a dry atmosphere. It however undergoes the changes in breadth in the same manner as other wood. He examined a great number of different sorts of wood; but not one showed the phenomenon of box-wood. That vegetables as organized bodies are possessed also of vital powers, admits of no doubt, as is sufficiently demonstrated by their growth, formation, and decay. On a few different parts only, the operation of the applied stimulus becomes visible. The leaves of Mimosa *pudica*, *sensitiva*, *casta*, of Oxalis *sensitiva*, Dionœa *muscipula*, and other plants which grow only within the tropics and under the equator, contract when touched. Less conspicuous, but easily demonstrable, is the contractility in the indigenous species of Sun-dew, Drosera *rotundifolia* and *longifolia*. The filaments of Urtica, Parietaria, Berberis, and others, show great irritability, and likewise the pistils of some plants, especially the stigma of Martynia. According to some experiments, light acts as a particular stimulus upon plants. Vegetables appear to be little susceptible of the power of Galvanism. The result of the experiments hitherto made, is so very dubious that we cannot venture to advance any opinion upon this subject. Electricity acts powerfully upon plants as well as upon animals, and the effects which it produces in both are exactly the same: viz. Electricity, when faintly applied, is beneficial to their growth, but becomes hurtful to them when exerted with any degree of violence. Van Marum destroyed plants by violent electric shocks, and I myself made a similar experiment on the Drosero *rotundifolia*. This plant remained quite uninjured in the electrical bath, but when I began to extract sparks from its leaves, it soon withered away. The power of reproduction, which is one of the consequences of life, is common to animals and plants. It is less perceptible in plants than in animals and worms. Slight wounds in the cortex heal very easily; and Duhamel, after he had, with the greatest care, completely removed the bark of a tree, observed it again beginning to appear. With regard to plants of many stamina, it has been alleged by some, that, immediately after the removal of the stamina, similar bodies, though void of pollen, are reproduced. But this is not properly reproduction, because the parts thus procreated are not of the same structnre as formerly. The leaf of a plant, which has been at all mutilated, will never be renewed, neither will the leaves of flowers, which have been injured, either in a perfect or imperfect state, ever be fully reproduced. If we divest a willow, or any other tree, of its branches, and the tree produce new ones, we cannot look upon this as a reproduction, because the tree is a compound plant, and every branch, or rather every bud, can be considered only as a particular plant. Thus, then, the growth of the pruned branches is a production, but not a reproduction, for in the greater part of leaf-bearing wood, the whole surface is capable of producing buds and branches. Philosophers have constantly endeavoured to discover resemblances between animals and plants. Aristotle called vegetables reversed animals. Linneus pursued this idea still farther; but his lively imagination carried him too far, when he denominated heat, the heart, and earth, the stomach of plants, and even when he, with more justice, compared the leaves of plants to the lungs of animals. Comparisons of this kind must always fail, as animals and plants differ very materially in the form of the organs of which they are composed.

"But the most successful on this head was the immortal Bonnet, who, in a very ingenious manner, has compared the egg, the embryo, the nourishment, and the generative organs of animals, to those of vegetables. This likeness, which philosophers observed between animals and plants, chiefly consisted in properties, which organized bodies possess without respect to their structure. It is, therefore, certainly worth while, to consider more accurately, in what respects plants differ from animals. Animals take food by a certain aperture, and have a particular canal by which they propel their excrementitious matter. Plants, on the other hand, take in nourishment with their whole surface, and except transpiration, which they possess in common with animals, have no peculiar canal to expel their excrements, unless we consider the drops which are found on the roots of some luxuriant plants as a proof of the contrary. Plants have a structure altogether different from that of animals. They consist of variously combined vessels, which are surrounded by a cellular membrane. The existence of muscles in plants has not yet been clearly evinced, nor have nerves hitherto been perceived in them. The wood, which some have compared to bones, has certainly not the least resemblance to them. Plants consist of a cuticle, which appears in woody plants to be converted into the outer bark. It covers the inner bark, which is solely composed of vessels. This is followed by the soft wood, as it is called. The wood is enclosed by the last, and surrounds the pith. The inner bark, alburnum, and wood, are one and the same substance at different periods of growth. The inner bark is converted into alburnum, and this into wood. They are all three compressed vessels, which are more or less hard, or still soft. The pith almost entirely disappears in very thick large trunks, by the increasing solidity of the wood, and only in a few plants remains uniformly throughout all parts of the trunk. We find it in herbaceous plants, but most aquatic plants want it entirely. The stems of herbaceous plants have neither alburnum nor wood. The epidermis, which rarely in them is converted into bark, incloses a ring of vessels, corresponding with what in woody plants is called the inner bark. Immediately beneath this we have a more or less dense cellular membrane, which is often very succulent; and next to it, a fleshy substance. This incloses the pith, which in fact is a cellular texture of a different nature, at times dry or juicy, at other times consisting of close and narrow cells.

"Animals, with the exception of some of the vermes, are simple beings, but most plants not so; for only some annuals and Palms are simple plants, the rest are all of a compound structure. If we put the seeds of an annual plant in the ground, plants grow from it, which soon flower, produce seeds, and then die. The buds of trees and shrubs are to be considered as annual plants, for as soon as they have blossomed and shed their seeds, they entirely decay. The trunks of trees and shrubs, as well as the roots of perennial

plants, have a great many buds, which are all of the same nature, and may be considered as repositories of many other annual plants. They are, therefore, not simple, but, like the polypes in the animal kingdom, compound bodies. Below the bark in these plants, there are, according to the species, the rudiments of a number of buds, which, by a due supply of sap, may be finally evolved. New-formed branches of clipped willows, are therefore not to be considered as reproduced parts. We learn from chemical analysis, that the constituent parts of vegetables are very different from those of animals. Carbon, hydrogen, and oxygen, are the simple substances of which plants are principally composed. Azote is perceptible in all the parts of animals, excepting in the fat. It is found in few plants, and that only in particular parts. Carbon, is the chief constituent of vegetables. It is from this that plants in dry distillation emit so great a quantity of carbonic acid gas, and leave behind them many pieces of coal. Sulphur and phosphorus, both of which abound in animals, are but rarely observed in the vegetable world. Sulphur becomes perceptible in the roots of the Rumex *Patientia*, after they have been rubbed and immersed in water. Sulphur and phosphorus are both visible in plants of the fifteenth class, (Tetradynamia,) which also contain azote. They are found also in the seeds of the different species of grain. The seeds of Sinapis *alba*, and Triticum *æstivum*, when distilled, emit phosphorus; and the ashes of all plants of the Tetradynamia class contain phosphate of lime. Potash, or vegetable alkali, exists in almost all plants, though in very small proportions. The Filices, the Erigeron *Canadense*, the fruits of the Syringa *vulgaris* and Æsculus *Hippocastanum*, are alone particularly supplied with it. It is found most frequently in combination with vegetable acids. Soda is peculiar to marine plants. Lime is a residuum found in the ashes of plants, and was formerly combined with vegetable acids. It is most plentiful in the Chara *tomentosa*, a pound of which yields six ounces of carbonate of lime. In the Fungi, at least in the Peziza and Byssus, not a particle of lime can be discovered. Alumina, silica, and magnesia, are not nearly so general. The first occurs very seldom. Silica exists in the ashes of most vegetables, but is found chiefly in the Grasses. In the Bambusa *arundinacea*, it produces a peculiar concretion. It also forms a constituent part of the fibres of plants. It appears to exist in the wood of the Alnus *glutinosa* and Betula *alba*, as the wood when turned upon the lathe frequently appears to glitter. Magnesia is much less frequent than lime. Some plants, however, possess it in as great a degree. Thus, the Salsola Soda has in one pound nearly five drachms of pure magnesia. Barytes is alleged by some to exist in the Grasses. Iron, but still more frequently manganese, is perceptible in the ashes of almost every plant. The following salts, compounded from neutrals, are the most abundant in the vegetable kingdom: Sulphate and muriate of potash, sulphate of lime, sulphate of soda is not common. It is found in the Tamarix *gallica*. Muriate of soda exists in several marine plants, and is found in a crystallized form on the leaves of a South American plant. Nitrate of potash is seen in the Borrago *officinalis*, Helianthus *annuus*, Mesembryanthemum *crystallinum* and *edule*, Achillea *millefolium*, Fumaria *officinalis*, Sonchus *arvensis*, &c. &c. Nitrate of magnesia, in Zea *Mays*.

"From the chemical principles now premised, various substances are formed, according to the diversity of proportion, and the particular kind of combination. These are called the more immediate constituents of vegetables. The following are all that have hitherto been discovered: 1. Mucilage, a tasteless friable substance, destitute of smell, and soluble in cold or warm water, to which it communicates a viscidity. It is found in almost all plants, and in some forms the constituent part; for example, in the roots of the Althæa *officinalis*, in the stalks of the Astragalus *creticus* and *gummifer*, in the leaves of the Malva *rotundifolia*; in the seeds of the Pyrus *Cydonia* and Plantago *Cynops*, in the flowers of the Verbascum *Thapsus*, &c. It exudes from the bark of some trees like gum; for example, Mimosa *nilotica*, Prunus *domestica* and *avium*. 2. Sugar possesses a peculiarly sweet taste, dissolves in cold or warm water, and in spirit of wine. It is found in a great many plants, but seldom pure, as it is generally combined with mucilage, extractive acids, or neutrals which have an excess of acid, neutral salts. Pure sugar is obtained from Saccharum *officinarum*, Acer *saccharinum* and *dasycarpum*. A mixture of honey and manna differ very little from sugar. 3. Vegetable acids consist of carbon, hydrogen, and oxygen, and their diversity originates in the variable proportion of these constituents. We are at present acquainted with six kinds of vegetable acids, namely: I. Tartaric acid, is found as supertartrate of potash in the fruits of the Vitis *vinifera*, Tamarindus *indica*, Berberis *vulgaris*, and Rhus *typhinum*, in the herb Melissa *officinalis*, and Centaurea *benedicta*, in the roots of the Ononis, &c.: II. Oxalic acid, which, like the former, is frequently combined with potash, occurs as superoxalate of potash in different species of the Oxalis and Rumex. It is found perfectly neutralized in a great many barks and roots, and in this state is particularly plentiful in Rhubarb: III. Citric acid, is discovered combined with a little mucilage, in the fruits of Citrus *medica*, Vaccinium *Oxycoccus*, *Vitis idæa*, and Prunus *Padus*. It is found almost equally mixed with mucilage and malic acid, in Ribes *Grossularia*, Rubus *Idæus*, Ribes *rubrum*, Vaccinium *Myrtillus*, Pyrus *Aria*, Prunus *Cerasus*, Fragaria *vesca*, &c.: IV. Malic acid, differs from the preceding in this respect, that it never appears in a crystallized form. It is found as pure acid, and never combined with potash. It is contained almost pure, at least combined only with sugar and mucilage, in sour apples, in the fruits of the Sambucus *nigra*, Prunus *spinosa*, Sorbus *aucuparia*, and Prunus *domestica*. The juice of several species of Sedum, Sempervivum, Crassula, and Mesembryanthemum, contains a great quantity of supermalate of lime: V. Benzoic acid, may be sublimed without being destroyed. It is discovered in the resin of the Styrax *Benzoin*, in the balsam of the Myroxylon *peruiferum*, and Toluifera *Balsamum*, and the last of all in the fruit of the Vanilla *aromatica*: VI. Gallic acid, possesses the property of precipitating iron black, and is found combined with tannin in all plants of an astringent taste. 4. Starch does not combine with cold water, but combines with boiling water, and forms a well-known paste. It is a constituent of the different species of corn, of bulbous roots, and others; such as, Orchis, Arum, Jatropha *Manihot*, Solanum *tuberosum*, Bryonia *alba* and *dioica*, Pœonia *officinalis*, &c. The pulp of some Palms is pure starch; for example, the well-known sago of Carota *urens*. It is found in the seeds of some plants, as in Æsculus *Hippocastanum*, Amygdalus *communis*, Lichen *islandicus*, *rangiferinus*, &c. and in many Liverworts. 5. Gluten seldom occurs in the vegetable kingdom. It does not dissolve in water of any temperature. Before being dried it is very viscous, tenacious, and elastic; when dried, it resembles horn, and burns with precisely the same smell. Upon the whole, as it contains azote, it approaches nearer to animal substances. It is separated from the flour of wheat by washing in cold water. It is found also in the juices of Beech

and Birch trees, and in the woody fibres of several plants. 6. Albumen dissolves only in cold water. It is hardened by boiling water, and, when distilled, sets loose volatile alkaline salt. It is found in the farinaceous seeds of several plants, in those of the Tetradynamia class, in the juice of White Cabbage, in the root of Scilla *maritima*, &c. 7. The extractive principle when separated from other constituents with which it is combined in the plants, is a solid bitter rough-tasted substance, which may be dissolved at any temperature in water or spirit of wine. It discovers itself chiefly by its great affinity for oxygen, which it rapidly absorbs, thus becoming insoluble in water. It is found in almost every plant without exception, never pure, but combined with mucilage, sugar, resin, acids, &c. &c. In modern times only it has been properly distinguished. Formerly it was confounded with vegetable mucilage, or, when by being combined with oxygen it had become insoluble in water, it was considered as resin. The name, Soapy Matter, which is sometimes given to this substance, is improper, and often leads to very erroneous ideas. 8. Tannin is a solid friable brown substance of a very astringent taste, and has some resemblance to the extractive principle, but differs in this respect, that it transforms animal jelly into a viscid substance insoluble in water and proof against corruption. On this is founded a property which plants, containing this matter, possess, of converting the gelatinous skin of animals into insoluble leather. Tannin also precipitates in various colours the metals which have been dissolved in acids. It precipitates iron black, by which means common ink is obtained. It is always found combined with gallic acid in the barks of many trees, in many kinds of wood and roots, in the leaves of some plants, and in the excrescences occasioned by insects. It abounds chiefly in Quercus *Robur* and *pedunculata*, Rhus *typhinum*, in the bark of Salix, Alnus, Fraxinus, and Cinchona, in the nut-shell of the Juglans *regia*, in the roots of Tormentilla, Potentilla, Fragraria, Polygonum *Bistorta*, &c. &c. 9. Fixed oil is an inflammable tasteless fluid without smell, and is not soluble either in water or spirit of wine. Combined with caustic alkaline salt, it becomes soap, which is soluble in water: it is destroyed by the heat of boiling water. It consists principally of hydrogen and carbon, and is found almost exclusively in the seeds and fruits of vegetables; for example, Amygdalus *communis*, Linum *usitatissimum*, &c. &c. Cyperus *esculentus* is the only plant hitherto discovered, the root of which yields fixed oil. 10. Wax is a vegetable oil condensed by oxygen, and is discovered in the fruits of Laurus *nobilis*, Myrica *cerifera*, Tomex *sebifera*, and in the pollen of almost all plants. It is from this that bees prepare their wax. 11. Resin is a brittle solid substance, which, though insoluble in water, may be dissolved in oil and spirit of wine. It is melted with slight heat, and burns with the application of flame. It is found in a great many plants, as in the Pinus, Juniperus, &c.; combined with real volatile oil, it is called Balsam. Some allege that the name Balsam should be given only to such resins as contain benzoic acid. 12. Caoutchouc is a very elastic substance, not unlike leather, and is soluble only in ether. It proceeds like milky juice from the trees in the torrid zone; for example, Suphonia *Cahucu*, Commiphora *Madagascariensis*, &c. It is found in the berries of Viscum *album*. It is probably a constituent of several gum-resins. 13. Gum-resins, mucus-resins, are to be considered not as mere mixtures of mucus or gum and resin, but as possessing a compound nature, and as properly forming the more immediate constituents of vegetables. They flow like milk from several plants. Some approach to the nature of oxidized extractive. They also contain resin, sugar, mucus, caoutchouc, and volatile oil. Several species of gum used by apothecaries belong to this class; for example, Assafœtida, Sagapœnum, Ammoniacum, Galbanum, &c. &c. 14. Volatile oil is an inflammable volatile liquid which, wholly dissolves in spirit of wine, and partially in water. It has a remarkable taste and smell, and may be distilled over without being destroyed. It is found in a great number of plants, and may be contained in all their parts, roots, wood, rinds, leaves, flowers, fruits, principally, however, in the *pulp* of fruits. Although volatile oils all agree with one another in their essential qualities, they differ considerably in regard to colour, smell, taste, consistence, and weight. In progress of time they condense, and assume the appearance of resins, by being combined with oxygen. 15. Camphor is a solid white-coloured substance, friable, and very inflammable. It has a peculiar smell and taste, and is extremely volatile. It exists chiefly in all the parts of the Laurus *Camphora*, as also in many species of Laurus *Cinnamomum*, &c. Some volatile oils also contain it; for example, those of Lavandula *Spica*, Origanum *Majorana*, Salvia *officinalis*, &c. 16. The bitter principle is found in those plants which in a fresh condition burn the mouth and blister the skin, but which lose this property when dried; for example, Scilla *maritima*, Arum *maculatum*, Helleborus *niger*, Chelidonium *majus*, Digitalis *purpurea*, most of the species of Ranunculus, &c. &c. It is sometimes combined with volatile oils; for example, Cochlearia *armoracia*, *officinalis*, Sinapis *alba*, *nigra*, &c. 17. The narcotic principle is considered as the original cause of the bad effects which the fruit of several plants produces on the brain, in diminishing the power of sensation and motion, and, when taken in large doses, by inducing sleep, and in the end occasioning vertigo, stupefaction, and even death. To this description belong Papaver *somniferum*, Hyoscyamus *niger*, Datura *Stramonium*, Prunus *Laurocerasus*, Atropa *Belladonna*, &c. 18. Fibrin must necessarily be considered as a proper constituent of vegetables, as its chemical process in plants is different from what it is in all other bodies. It is quite insoluble, has neither taste nor smell, and, beside the three necessary elements, also contains azote.

"As the life of animals depends on external warmth, so likewise plants need a certain degree of it. Plants of warm countries require more of it than those which belong to cold ones. These are facts which need no further demonstration. But whether plants, like animals, have a fixed and peculiar degree of heat, is a question which must now be answered. We find that trees or shrubs, in cold climates, if they grow wild, endure the greatest cold without harm. As soon as the warmth of spring commences, they evolve their buds, and apparently suffer no bad effects from the cold, though their stem and branches are full of moisture. If in a strong frost we put vessels with water close to such a tree, we shall find that the water is converted into ice, but that the tree retains its sap unfrozen, and remains quite unhurt. The case is different in plants of warm and hot regions. The sap of these plants congeals at the least degree of cold, and the plants decay. Thus there appears a remarkable difference between the plants of cold and those of hot climates. As long as plants live, and possess sufficient vital power to resist cold, their sap will not congeal. But after the buds have been forced out by the warm weather of spring, they will, when exposed to cold evenings, be observed to congeal. We find, likewise, that dead or diseased branches are more liable to be frost-bitten than living and sound ones, and that branches, by their sap being congealed, are destroyed. The Birch and some other plants, it is well known, often have their roots

covered with ice, without suffering the least injury. In the northern hemisphere of our globe there are many and extensive tracts of Pine-trees, which resist with their evergreen branches the most severe winter cold. From these observations it follows, that each plant, according to its species, possesses a peculiar degree of warmth, which defends it against the inclemency of the weather. But this heat in vegetables is not of such a nature as to enable us to judge of its peculiar degree by our senses. We know that every animal has a certain degree of heat. We find a frog or lizard cold, although nature has given them a certain degree of heat. The temperature of plants is such as to enable them to resist both heat and cold. If, in a hot summer day, we touch some ground which is much exposed to the rays of the sun, and immediately after put our hand on green grass, equally exposed to them, we shall find the ground much hotter than the grass. Fruits, though much in the sun, will be cool, whereas a glass full of water will be quite warm in a much shorter time. Sonnerat discovered in the island of Lucon a rivulet, the water of which was so hot, that a thermometer immersed in it rose to 174° Fahrenheit. Swallows when flying seven feet high over it, dropped down motionless. Notwithstanding this heat, he observed on its banks two species of Aspalathus and the Vitex *Agnus Castus*, which with their roots swept the water. In the island of Tanna, Messrs. Forsters found the ground near a volcano as hot as 210° Fahrenheit, and at the same time covered with flowers. Hence it naturally follows, that plants, like animals, have a peculiar temperature, according to their native countries, which they cannot exceed without injury. The experiments of Mr. J. Hunter and Schoepf shew us the same thing. The first put a Scotch fir, three years old, in a freezing mixture of between 15 and 17° Fahrenheit. The youngest shoot froze; the fir was again planted, the young shoot remained flaccid, but the first and second were fresh. Of young plants of oats, which had only three leaves, one leaf was exposed to artificial cold at 22°, and was instantly frozen. The root was put into the same cold mixture, but remained uninjured. He then planted it, and all its parts grew, except the leaf, which had been frozen. The same experiment he repeated in a young bean; a leaf of it was frozen in an artificial freezing mixture, and another fresh leaf was bent in the middle upon itself, put into a leaden vessel, and along with it the frozen leaf, which had been previously thawed. He afterwards put the vessel into a freezing mixture. The surface of the fresh leaf froze as far as it came in contact with the vessel between 15 and 17°, the atmosphere being at 22°. The frozen leaf froze much sooner. These experiments were repeated, and attended with the same result. The juice of spinnage and cabbage, when squeezed out, congealed at 29°, and thawed again between 29 and 30°. This juice was frozen in a leaden vessel, and then put into another, with a cold mixture at 28°. The leaves of a growing fir-shoot, and a bean-leaf, were put upon the frozen liquid, which in that place thawed in a very few minutes. The leaves had the same effect when removed to other frozen spots.

" The anatomical investigation of vegetables explains the nature of their internal parts. The following organs have been discovered in them; air vessels, adducent vessels, reducent vessels, lymphatic vessels, cellular texture, vegetable fibre, and glands. These parts are visible only through magnifying glasses, either by subjecting them to maceration, or by putting them in newly cut pieces under a microscope. Some of them, particularly the adducent vessels, may be filled with a strong coloured liquid, by which means they are so much the more easily observed. This, however, is the case only with a few. The injection of vessels with a coloured liquid is accomplished by putting the stalk of a plant into a decoction of brasil wood, and placing it in a warm temperature. Injections of this kind do not succeed with all plants, but are particularly suitable to the Impatiens *Balsamina*. The *air vessels*, are thin, hollow, corrugated vessels, smooth within, and running perpendicularly through the plants. They are conductors of air, and never change their diameter, but uniformly remain open even in the hardest wood. How they are connected with the pores of the epidermis, has not yet been discovered by any observations. The *adducent vessels*, are situated close to the air vessels, and have a double direction. They either proceed in a straight line with the air vessels, or they twine around them in wide or narrow interstices, but they are often involved in spiral windings, so close that no interstice can be perceived. When they have this twisted appearance, they are called spiral vessels. In plants we discover twisted vessels of greater or less extent, as well as those which run straight out in lines. There are also vegetables in which they are never twisted, but uniformly proceed in straight lines; for example, Sagittaria *sagittifolia*, and all the Filices. It is a singular circumstance, that in the Filices, bundles of these last mentioned vessels are surrounded with a peculiar sort of membrane which is quite abstracted from the cellular texture, a section of which shows it to be more or less circular, lunated, or of a different form. These vessels are much more delicate than air vessels in their diameter, and even do not retain the same figure. They visibly grow larger, become rough, and when beginning to harden have their interior covered with contiguous fibres; in the end they are almost completely obstructed. *Reducent vessels*, descend between the cellular texture, and are variously accumulated. Sometimes they take a horizontal direction. Hedwig supposes them to be intended for the purpose of transpiration. They are more delicate than the adducent vessels. *Lymphatic vessels*, are found upon the epidermis. They are extremely delicate, run singly, and are reticularly united. The circle or quadrate which is described on these vessels, has usually in its centre an aperture, which, however, has no connexion with the vessels. The reticular form varies greatly in vegetables. It is constantly found in every species, and in a few is subject to some alterations. Thus, for example, in the Lilium *Chalcedonicum*, these vessels run in an undulating manner, and describe very irregular oblong figures or even rhombi; in the Allium *Cepa* they do not undulate, but proceed in an oblique direction parallel to one another by short continuations of the sides; in the Dianthus *Caryophyllus* they describe parallelograms which terminate pretty regularly. This reticular texture covers all the parts of plants, only the apertures which it surrounds are not always obvious. On the root, on the surface of the leaves, on the interior side of the valves of the calix, especially when they are coloured, on the interior of the petals, on the nectaria, in stamina and pistils, no pores can be discovered, and only the cicatrice has them sometimes. That this kind of net on the cortex of vegetables is not occasioned by the pressure of the cellular texture, but consists of real vessels, appears to be beyond all doubt. The *cellular texture*, is a very delicate membrane, divided into an infinite number of variously formed small spaces, which are closely connected with one another. It surrounds the vessels, and occupies the internal as well as the external interstices, covers both surfaces of leaves, and is most plentiful in the juicy plants and fruits. The *pith* of vegetables is a more dense cellular texture, distinguished by its bright white colour, by its finer and more compressed cells, and by its spungy appearance. The juices conveyed in the cellular

texture vary according to the different species. They are Resinous, in many species of Fir, &c.; Gummy, in fruit-trees and some species of Mimosa; Lymphatic, in almost all plants. The colour of the juices found in the cellular texture, is also very multifarious. The sap likewise varies in colour: It is White, in Euphorbia, Papaver, Leontodon, Pinus, &c; Yellow, in Chelidonium; Red, in Rumex *sanguineus*, Dracæna *Draco*, Pterocarpus *santalinus*, and Calamus *Rotang;* Blue, in the root of Pimpinella *nigra;* Green, in some Umbellatæ; Colourless, in most plants. The *juices* in fruits are known to be of all colours. Rafn discovered a great analogy between the sap of plants and the blood of animals. He detected with a microscope magnifying 135 times, in the lymph of Euphorbia *palustris*, round globules, like those in blood, swimming in a fluid somewhat more clear, but not so clear as water. Fontana observed the same in the sap of the Rhus *toxicodendron*. Rafn, however, found in the Euphorbia, besides the globules, prisms, which appear in Euphorbia *peplus*, *heliöscopia*, *esula*, *cyparissias*, and *lathyris*, though somewhat different. In no plant but the Euphorbia and Hura *crepitans* could he detect the prisms. One drop of lymph of Euphorbia *Canariensis*, *Caput Medusæ*, Chara *neriifolia*, had one or two prisms at most. Alcohol congealed the juice of the Euphorbia, and formed a great deal of fibrous matter. Vitriol also converted it into fibres, which however were not so thick. The sap of Chelidonium consisted of nothing but closely cohering globules. In the colourless vegetable juices, even in them which are seemingly moist, the same globules appeared. A proof that the sap of some vegetables, for instance, the Potentilla *anserina*, is not, as Plenk supposes, merely impure or unfinished water. Rafn found in those plants which have much cellular texture, *e. g.* the Musa *paradisiaca*, Strelitzia *regina*, the globules smaller and less frequent than in the species of Euphorbia. The apertures which are discovered between the lymphatic vessels on the epidermis of plants are connected with the cellular texture, and by the operation of the rays of light may be opened and shut, and, according to Hedwig, are designed for transpiration. Secondary vessels, which Schrank has amply described, are hairy or bristly formed elongations of the epidermis, of a complicated nature, hollow within, and are connected too with the cellular texture. Some suppose that they are created for the purpose of suction. Soft down, and the fleecy covering of several seeds, appear to be only protracted secondary vessels. The *vegetable fibre*, is a thin filiform body, found in bundles, and has apparently no cavity within; it is encircled with a cellular texture, which forms around it a particular kind of sheath. That this single fibre of vegetables may consist of several, will not be disputed; but to resolve it into its individual parts, and to demonstrate the most simple fibre, will probably continue to baffle our researches. Rafn is much inclined to consider the vegetable fibre as a particular and original organ, similar to the muscular fibre of animals. Hedwig, on the contrary, supposes it to be an obsolete constipated vessel. A great deal might be advanced in favour of this last opinion; for, as plants annually form new vessels, the number of fibres appears to be increased by the old vessels. Notwithstanding, however, it is alleged, by others, that fibres at their very origin have been found constipated between the leaves of herbs. But even should future observations lead us to regard this fibre as a constipated vessel, still it appears certain that the skin of the vessels themselves is of a muscular nature, as it is capable of contracting and expanding in a regular manner. *Glands*, are in vegetables of multifarious situation and figure. Though their internal structure continues, upon the whole, pretty equal, they have not the most distant resemblance to animal glands, and their having the same designation is entirely owing to their being more or less roundish elevated bodies. They are found internally and externally, according to their situation. Internally, they are situated in the cellular texture, or fleshy part of vegetables, and are found of a globular, somewhat oblong and lenticular figure, in the middle or the partitions of the cells, as also in the inner bark. Externally, they are discovered in all parts of vegetables, either half sunk in the cuticle, rising to the surface, or possessed of stalks. They have then a very extensive variety of shape; sometimes they are perpendicular, oblong, or depressed; sometimes very elevated and pointed, having their upper part furnished with a small hole, or even surrounded with an elevated margin. The different species of glands are exceedingly numerous, and may be distinguished by calculating all the varieties. Being sometimes more, sometimes less obvious, they are, in the Hypericum *perforatum*, considered merely contrary transparent particles, which are visible when exposed to the rays of light. In the Hypericum *montanum*, they are easily observable by their brown colour; and in the genera Passiflora, Mimosa, and Croton, their magnitude is sometimes so very considerable, that the mere touch of them serves to convince us of their existence. Glands consist, internally, of a dense cellular texture, which is too dense in proportion to the middle. Immediately under their skin, and upon the vertex, they contain a matter more or less coloured, odoriferous, or insipid, according to the variety of the plants. The glands which are situated in the interior of the plants, have no connection with the vessels; but glands which are evidently situated on the outside of vegetables, have spiral vessels pressing forward to their centre, and then returning in a retrograde direction. The anastomosis of vessels in the vegetable kingdom is totally different from what it is in animals. The adducent, reducent, and air vessels, uniformly run in bundles through the vegetable body more or less perpendicularly; these separate into smaller bundles, which unite with the nearest body, and out of these still smaller ones adhere to a greater body; so that, upon the whole, by the separation and union of the bundles, a reticular appearance is produced. Lymphatic vessels, however, run singly, and anastomose like the vessels of animals, their boughs really uniting with the other branches.

"After these general discoveries made by physiologists in the vegetable kingdom, it will be proper regularly to examine the most remarkable phenomena which have been observed in vegetables from their origin out of seeds to their decay, and briefly to comprehend the inferences which hitherto have been drawn, that the recurring scenes of life and death in all their various forms may thus be more fully elucidated. The structure of the seed has already been explained, and we know that it serves the same purpose as the egg of animals, *i. e.* it contains the rudiments of a new being perfectly similar to its parents, and waiting only for a favourable opportunity of being evolved. All plants are propagated by seeds; and we may boldly exclaim with Harvey, "*Omne vivum ex ovo.*" It cannot indeed be denied, that they have not been found in *all* plants; but their existence in Mosses, Liverworts, Mushrooms, and many others, where formerly it was obstinately disputed, has, by the unwearied diligence of philosophers, now been completely ascertained; and we have no doubt that they will one day be observed in those where at present they are merely supposed to exist. Agreeably to the eternal and immutable laws of nature, we observe, just as in the animal world, the same species arising always from the seed; and no other vegetable can ever issue from

it, how different soever may be the circumstances of its germination. The sketch of the shoot is narrowly circumscribed by nature, and nothing is capable of producing an alteration in its parts. The same form will be retained, and propagated for ever. A seed has integuments, corcle, and cotyledons. It is fastened by an umbilical cord; and as soon as this separates, a cicatrice remains, called the Eye. In its vicinity lies the corcle. In the hardest seeds this last spot is the only one not covered by the internal hard membrane. When the seed is placed in the ground, moisture soon pervades its substance through this aperture, assisted by the warmth of the atmosphere. In the corcle and cotyledons, all the described vessels are present. In the last, the adducent and air vessels divide themselves into numerous bundles, which frequently anastomose in the manner peculiar to the plant. A cellular membrane covers on both sides those vessels which spread on one plain surface, and contains the reducent vessels. On both surfaces the lymphatics spread out and surround the apertures of the cuticle. The pervading moisture is communicated to the vessels; the water is decomposed by them, and hydrogen and oxygen transpired. Carbonic acid gas, which seems to be shut up in the neighbourhood of the umbilicus between the external and internal membranes of the seed, is likewise partly set free. The intercepted air which was received from germinating seeds, contained, in 10 cubic inches, sometimes 2, sometimes 3, 5, even 8 cubic inches of carbonic acid gas, and from 5 and 6 to 8 cubic inches of azote and hydrogen gas mixed. This gas, when mixed with atmospheric air, explodes at the approach of flame. The rest of the undecomposed water, with the fixed part of carbon and hydrogen, pervades the vessels more and more, reduces the substance of the seed to a milk-white fluid, occasions a stimulus, and by the irritability of the vessels, excites the action of the vital power. The vessels, filled with their sap, carry it to the corcle, which is elongated by it, and converted into a plant. The corcle consists, we know, of the rostel and the plumule. From the first arises the root; from the last the trunk, or the part above ground. Cutting a germinating plant in a perpendicular direction, so as to divide it into equal parts, we observe in the middle of each cotyledon a hollow channel, which is called the chyliferous duct, which is continued as far as the beginning of the rostel, proceeds between its pith and fleshy substance, and at last incloses the pith. This duct serves to convey the nourishing fluid, which the cotyledons contain, to the young plant. Experience teaches us, that germinating plants, even though they have some leaves already evolved, cannot part with their cotyledons without endangering their lives; like a young animal, which cannot want the feeding breast of its mother. It is a remarkable phenomenon in the germination of seeds, that the radicle first elongates, and pushes into the earth, where, as soon as it fixes itself, the plumule appears in its peculiar shape. Even though the seed should be inverted and put into the ground, so as to turn the rostel towards the surface, yet it never will grow upwards. It grows long, but soon turns the seed, and goes into the ground, so that it recovers its proper position. This observation, which may be made every day, especially in the Kidney Bean, in the Common Bean, and other culinary seeds, has greatly attracted the attention of botanists. It is to be observed, that seeds are not all provided with the rostel, especially those of some aquatic and parasitic plants, and perhaps all those which Dr. Gærtner styles *acotyledones*. I was, as far as I know, the first who discovered this by examining with great care the Water-caltrops, (Trapa *natans*,) one of the most singular plants. The nuts, as they are called, of this plant, when they lie in water, the natural habitation of the plant, shoot forth a long plumule, which in a perpendicular direction rises towards the surface of the water, its sides pushing out, at certain distances, capillary branched leaves. Some of those leaves bend downwards, and take firm root at the bottom. In this case then the plant becomes fixed in the ground, not by a peculiar root, which, like the rostel, pre-existed in the seed, but only through the leaves. It would be as difficult as in the rostel, to state the reason why some of the undermost leaves bend downwards, and by their capillary extremities shoot forth roots. From this, however, we are enabled to conclude, that some seeds may support the want of the rostel; but that a germinating seed can exist without plumule and cotyledons, is a supposition altogether inadmissible. Nobody as yet has attempted to deny the existence of the plumule in any seed. Linneus, Gærtner, Jussieu, and many other botanists, denied that of the cotyledons, especially in the plants belonging to the class Cryptogamia. Jussieu alone adds to those plants which have no cotyledon, (Gærtner's acotyledones,) such as want the rostel. Nature has provided plants with their cotyledons, that these might nourish the young plant in its tender infancy. Never yet have I met with a single instance where this wise measure of nature was omitted. I examined purposely all those plants which were said to want cotyledons, and always found them. That in some plants the existence of the cotyledons was altogether denied, and others were said to have one only, others two, and several plants more than two, arose partly from inaccurate observation, partly from mistaking a part of the plumula for a cotyledon. Placenta, or cotyledon, is the name of the whole substance of a seed, not including the parts of the corcle. It rises in many plants with the plumule above ground, and is converted into leaves; or, it remains in the ground, and, as in the Gramina and Lilies, the first leaf of the plumule only rises, and this is what some thought to be a cotyledon. In Flax, and the species of Fir, both cotyledons are converted into leaves, and the leaves of the plumula are evolved immediately after them, and are of the same magnitude and appearance. Hence it was, that botanists supposed there were many cotyledons. The division, therefore, of plants into acotyledones, monocotyledones, dicotyledones, and polycotyledones, is erroneous. I am acquainted only with three varieties, which are discovered in the cotyledons of the germinating seed. The cotyledons are either split into two parts, or they adhere so firmly to one another, that they cannot be separated. In the first case, they grow out of the earth till they become visible, and assume the appearance of leaves: these are denominated by botanists dicotyledones, and the same process takes place in the most of plants. As a very common example, I may adduce the Kidney Bean, Phaseolus *vulgaris*. In the second case, they remain in the ground, and only the plumule grows up, as in the Vetch, Vicia *sativa*, in the Pea, Pisum *sativum*, in all the Gramina, Lilies, &c. In the third case, the cotyledons, or the two halves of the seed, are not divided, but pushed upon the ground, and on their side the plumule is evolved, as in Juncus, &c. &c. I have not been able to perceive any more varieties, and every one may easily satisfy himself of the truth of what I have mentioned. I have observed, according to the changes in the cotyledons, five principal varieties, which I call membraneous corcles; filiform corcles; split corcles; earth corcles; and globular corcles; viz. *Dermoblastæ*, I call such as have the cotyledon in form of a membrane, which bursts in an irregular manner. This membrane is found in the Fungi, where, in general, it disappears imme-

diately after their evolution. We would require still further observations on this point, especially in the small Fungi, and even in these, different modifications may possibly appear; but this is merely a supposition about which nothing certain is known. Most of the plants which have this peculiarity are so very small, that their existence and characteristic varieties can be perceived with difficulty, much less is an accurate knowledge of such very minute plants to be expected. —*Nemoblastæ*. These appear in Mosses and Filices, and may perhaps be found also in Algæ. To prove their existence in the last, however, we still need more accurate observations. The substance of the cotyledon in them divides into two halves, and bursts into an irregular shape, resembling threads.—*Plexeoblastæ*, are those in which the cotyledons appear above ground in two parts, and change into leaves, which are of a different shape from the rest of the leaves. They are elliptic in the species of Phaseolus; linear in the Umbellatæ and in the Plantago; cordate in the plants of the 16th class of Linneus; inversely cordate in those of the 15th class; reniform in the ringent plants; wedge-shaped, and at the point variously intersected, in the Lime-tree.—*Geoblastæ*, are those which keep the substance of the cotyledons under ground, *e. g.* the Vetch, Pea, the Gramina, Lilies, &c. They are of a double kind: *Rhizoblastæ*, where the seed has a rostel, and shoots down a straight root, as in most plants belonging to this class: *Arhizoblastæ*, when the seed wants the rostel, as in some aquatic and parasitic plants.—*Sphæroblastæ*, are those whose cotyledons are not disunited, but which come out of the ground in form of little globules fixed upon a small stalk, and have the plumula on their side. This we meet with in Juncus *Bufonius*, *subverticillatus*, and some plants related to it. Several botanists, who were unacquanted with this singular mode of germination, have mistaken the abovementioned plant for a new one belonging to the 24th class of Linneus.

"It has long been known, that every plant affects its own peculiar soil, and that on this account seeds do not germinate in all kinds of soil, at least they soon decay in a disadvantageous one. Various trials have been made, to make seeds germinate in various matters, different from the usual earths. Sukkow made salad plants grow in pounded fluat of lime and barytes. Bonnet made plants grow in sawdust, slips of paper, cotton, and even in an old book. That Cress (Lepidium *sativum*) germinates upon a piece of woollen cloth, is a well known fact. Mr. Humboldt's experiments to make seeds germinate in metallic oxyds, especially the red oxyd of lead, and massicot, &c. are more instructive. In powder of coal and sulphur, seeds germinated likewise very well. He found that oxygen proved an extreme stimulus to plants, and that without it they never can be brought to germinate. On this account germination went on quickly in metallic oxyds, especially in minium. In oil, on the contrary, carbon, hydrogen, in the filings of lead, iron, and copper, as well as in the powdered molybdene and in alkalies, no one seed germinated. It soon occurred to him, that with oxygen as a stimulant he might forcibly make seeds germinate faster; and he actually found, that at the temperature of 20° Reaum. all seeds vegetated most rapidly when steeped in oxy-muriatic acid. One instance alone will suffice. The seeds of the Lepidium *sativum* germinated after six or seven hours, when put into oxy-muriatic acid; whereas, when lying in common water, they required from 36 to 38 hours. In a letter dated February, 1801, he writes to me, that in Vienna they derived much benefit from the discovery of this fact; and that seeds twenty and thirty years old, brought from the Bahama islands, Madagascar, &c. which constantly refused to germinate, very readily, in this way, vegetated, and produced plants which grew up very successfully. The Mimosa *scandens*, which as yet is not to be found in any botanic garden, grew very well with this acid. As every gardener cannot obtain the oxy-muriatic acid, Mr. Humboldt proposes a very easy method to procure it without difficulty. He took a cubic inch of water, a tea-spoonful of common muriatic acid, two tea-spoonfuls of oxyd of manganese, mixed it, and placed the seeds in them. The whole was now allowed to digest with a heat of 18 to 30° Reaum. In this the seeds germinate excellently; but it is necessary to take the seeds out, as soon as the corcle appears. That the seeds are not injured by the acid, is proved by the many plants which have been treated in this way, under the inspection of Mr. Jacquin, and in which vegetation went on extremely well. It is the oxygen of the atmosphere which stimulates the seed to germination. And this explains at once the experiment of Mr. Achard, why plants vegetate faster in very compressed air, than in air in its common state. Besides oxygen, ammonia too favours the germination of seeds; hence they germinate almost immediately when placed in dung, which therefore serves as manure. Cow-dung, we know, consists of muriatic acid and ammonia. In fluids which contain no oxygen, seeds will not germinate. Thus they never germinate in oil, which consists of hydrogen and carbon.

"It is the rostel of seeds which produces the part of a plant under ground, and which is called the descending stem or root. But physioloists call that part only a root, which carries nourishment from the soil to the plant, or what we before called radicles or fibres. In under shrubs, this stem descending under ground, consists of a bulbous, tuberous, fibrous, or oblong root. In annual plants it is more or less perpendicular; and in shrubs and trees its formation entirely resembles the stem. In this, foresters again distinguish two separate parts: the thick one, which descends perpendicularly, called the main root; and those parts which run forth horizontally in the earth, which are their horizontal roots. Anatomy shews us, that in herbaceous and biennial plants the adducent and pneumatic vessels form a circle in the root, the inside of which is closely compressed, the outside lined with cellular texture. The reducent vessels lie in this last; the lymphatics without apertures in the epidermis. Roots are quite destitute of pith; we never meet with more than one vascular circle, for as the duration of the first is only that of a year, or a few months, the new circle cannot attach itself to the old. One exception to this we have in the Beet, (Beta *vulgaris*,) which is a biennial plant: its root, when about a year old, has from five to eight of these vascular circles, as it is abundantly evident to any one who has observed the Beet. It follows, therefore, that Beets produce them more than once, and they make an exception to the common rule, which is worthy the notice of physiologists. Under-shrubs, which have no bulbs, knobs, or creeping roots, are provided with a concentrated circle of adducent and air vessels, which is surrounded with a strong cellular texture inclosed in the external integuments. Like all other roots, they are quite destitute of the tube of pith. A new circle is formed every year in such a manner that, at the part which lies nearest to the surface, we can determine precisely the age of the circle by the number of the rings. The smallest roots last many years, and are, according to the difference of the species, revived by new roots, which supply the place of the old ones when decayed. This is different in the creeping, tuberous, and firm bulbous roots: they have, according to their species, their vessels in a circle closer to the centre, or more or less distant from it. They are, however,

annually renewed, and the old ones die. On this account we find in most of them, for few live more than one year, only one circle. Bulbs, have at their base a fleshy bottom, from which radicles and new bulbs shoot forth. This consists of a reticular plexus of vessels, which are not circular as in other roots. These plants change their station, and, in common with animals, move from one place to another. The creeping root runs forth under ground; the branch, from which the new shoot arose, dies; and the young root now becomes attached to a distant spot. The palmated and testiculated roots, consist of two knobs, one of which completely dries up, and on the opposite side a new one is formed. This happens every year; and the plant in this way, after many years, appears on a different spot. Solid bulbs, especially the bulb of the Colchicum *autumnale*, undergo the same change; on the side of the old bulb a new one appears, the old one decays, and the whole at last becomes attached to neither place: and this is the case with most bulbs and tuberous roots. Very remarkable, and deserving particular attention, is the choice of food, which has been observed in some of the creeping roots. A Strawberry plant, in a garden of excellent soil, was planted in a particular spot filled with sterile sand. Stalks and roots all grew out towards the sides where the good soil was, but the main plant decayed. Several other remarkable instances are, at present, inexplicable; so little do we know of the physiology of plants.

"The descending stem, is probably composed of the stalk of the root, radicles, knobs or bulbs of various form, and these parts are almost always covered with fibres, which, like leaves, are renewed every year. In spring and autumn, and even in winter, when every thing is covered with snow, new ones, in cold and temperate climates, spring in place of the old dry ones. In warm and hot climates this happens during the rainy season, therefore always at a period when the vegetable world appears to sleep. The radicles grow in the following manner; a small bundle of air vessels lengthens, pierces the cutis, and runs into the ground. It is inclosed in a delicate cellular texture, covered by a thin membrane. Thus the extreme point of such a radicle is merely the end of the spiral vessels, which absorbs the necessary food from the soil. Those fibres, which are never wanting in earthly plants, cannot perform this function of taking up food longer than one summer, after which they must be succeeded by new ones. All plants do not grow in earth, and therefore the roots of some do not enter the ground. The parasitic plants are of this kind. The Cuscuta *Europæa*, when it germinates, lengthens its filiform plumule, winds round neighbouring growing plants, as Flax, Nettles, &c. and runs along them. Its rostel decays, and along the whole surface of the filiform branching stalk, a kind of warts shoot out, where it rests upon the other plants, serving as roots. Algæ, but especially Lichens, are, by similar warts, attached to the trunk of trees, and few pierce their external membrane. The Sphæriæ grow mostly on the inner bark of old decayed trees; they pierce or elevate the external membrane, and are firmly attached by wart-like roots. The Misletoe (Viscum *album*) pervades with its roots the woody part of branches, and becomes intimately blended with it. Amongst the numerous species of parasitic plants which the torrid zone produces, one species is particularly distinguished, which grows abundantly in the Indies beyond the Ganges, the Epidendrum *flos aëris*, for it grows and blossoms in the air, when hung up in a room. Mr. Loureiro, who saw this himself, assures us, that it vegetates hung from the ceilings of rooms for years, and is remarkably reviving to the inhabitants by the fine odour of its blossoms. Lantaria *Chinensis* and Rhapis *arundinacea*, as well as some other small Palms, are remarkable from having a part of their root next the stump springing from the earth, whence they have the appearance of being attached to a withered stump. The root is indeed, in the strictest signification, the plant itself. The stalks, leaves, and flowers, issuing from it, are only its elongations, which it makes on purpose to get proper nourishment. These may be cut off, and the root will always again throw out new elongations. The root may be divided, and each part will form a plant by itself; not so the stem, except in some ligneous plants, where the stem is merely the root elongated. Resinous or dry plants, as Pinus, Erica, Rhododendrum, are an exception to this, as in them the stem can rarely be injured, without injuring the whole plant. Many experiments made by inverting plants, prove clearly that the descending stem is not different from the stalk above ground. If a Plum or Cherry tree, not too thick, be bent with its top towards the ground in the autumnal season, one half of the top buried in the ground, and one half of the roots carefully taken out of the earth, covered at first with moss, and then gradually left quite uncovered; if afterwards, in the following year, the same is done with the rest of the top of the tree and the roots, the tree will shoot forth leaves on the branches of the root, and roots from those of its top, and in due time the root will come to blossom and bear fruit. A Willow is best adapted for making this experiment in a short time, and with success.

"We have seen, that the root arises from the rostel of the seed; and from the plumule, which is always bending uppermost, the upper part of the plant above ground, whatever its shape may be. The stem of herbs and shrubs, as well as the trunk, the scape, and the stalk, in short, all the varieties of the stem, have a channel full of pith, surrounded with a ring of adducent and air vessels. In the cellular texture lie the reducent vessels. The cellular texture, and membrane full of lymphatics, inclose the whole. The ring which the larger vessels form, accords with the form of the plant; triangular, pentagonal, or hexagonal. The same happens in the growth of the stems of trees and shrubs during the first year. Every year a new bundle of adducent and air vessels in a circular form is added externally to the old ones. The innermost bundles of vessels are more and more compressed, till the pith at last, except where this is natural to some shrubs and trees, entirely disappears, or is compressed to a very small point. The interior vascular circles become annually more dense, and at last get so hard as to form what is called wood. The less, or half-indurated external circles, consitute the alburnum; and the outermost one, which is just newly formed, is now called the inner bark. This last, then, is a circle round the stem of the tree, consisting of numerous, young, new-formed vascular bundles. It is divided into two parts, the exterior layer changing into bark, the interior first forming the alburnum, and then the wood. The bark, in ligneous plants as well as in herbs, is green and vascular; but as soon as it grows older, its green colour changes into brown; still the lymphatics retain their power. But the more the tree advances in age, the browner and darker the bark grows; it cracks, and the function of expiration cannot go on as before, nor are the vessels in the cuticle any longer visible. Some trees and shrubs lose their bark annually, and reproduce a new one from the inner bark. As instances, may be given the Platanus *occidentalis*, and the Potentilla *fruticosa*. The age of a tree or shrub may be easily determined by the number of these ligneous circles, upon cutting the stem off, close to the root. In the same manner the main root shews most accurately the age by its ligneous circles, when cut directly

below the surface of the ground. In the Palmæ, however, according to Daubenton's observation, this is very different. For if we cut a stem horizontally through, we find no difference between an old or young tree. In them, the vascular bundles do not dispose themselves in a circular form. They consist of vessels running in a straight line, without regular order, and inclosed by a cellular membrane. Nor do they grow thicker annually, or possess proper bark, but this is formed by the remnants of the leaves. Daubenton is not inclined to assign the name of wood to their substance; and proposes, if it were to be given to their fibrous substance, the name of *lignum fasciculatum*, to distinguish it from the common wood, which he calls *lignum reticulatum*. As the Palmæ are destitute of branches, their leaves do not arise from buds, but are in fact only small separated bundles of vessels of the stem, which expand in a leafy form. Hence it is that the under part of the petiolus remains, and forms the bark. If the vascular bundles of a tree or shrub remain in a straight direction, the stem ascends without forming any branches. The new shoots in the Hazel, (Corylus *avellana*,) Berberis *valgaris*, and all which the trunk of trees produced when lopped, are a proof of this. As soon, however, as the air-vessels become convoluted, and form a knot, branches are formed. By assistance of art, such straight shoots may be brought to branch, by making a transverse incision through the bark. The separated air-vessels heal, the lips of the wound are several times convoluted, and growing larger, are obliged to form more gems, from which branches arise.

"The growth of ligneous plants admits of five varieties: 1. Trees and shrubs, have their stems beset with leaves. On the base of each petiolus a bud or gem is formed, which again becomes a leafy branch, provided with gems formed in the same manner. If the main shoot grows at first in a straight line to a certain height without the buds on its sides being able, on account of the too hasty circulation of the sap, to form themselves into branches, or these, should they really be formed, not be able to grow any more, such a plant then becomes a tree, which has a straight and simple stem, with a branching divided top. But if the stem divides near the root, when the sap circulates more slowly, and each bud can unfold a branch, then this plant is a shrub. By means of change of soil, place, climate, and by art, trees may be changed into shrubs, and *vice versâ*. 2. Under-shrubs, have very leafy branches, which, however, are very small, and only deposit a very delicate circle of vessels. Hence every bud attached to a petiolus is not then really evolved, as their branches are very few. They are besides, as their branches are so delicate, of short duration, and often replace their old decayed branches, by young shoots from the roots. 3. The Pine tribe, have, however, very leafy branches, which on their extreme points only, and on one spot, evolve several buds, of which that in the middle grows in a straight direction, the other unfolding on its sides. Hence the appearance of some Pines like that of a twirling stick, by which, as every year a new one is added, the age of the tree may be found. 4. Shrubby Gramina, have a knotty culm, with attached and dispersed leaves. Each knot sends forth branches; but without a knot no branches appear. 5. Palmæ at Lilia *frutescentia*. These have a simple stem, which has leaves only at its top; and if this be injured, the stem decays. The last sometimes retain their life by lateral branches, but with the loss of the beauty of their growth and appearance.—Besides these varieties of ligneous plants, there are many which make a transition from one to the other. The Palms are incontestably the most beautiful of all ligneous stems, which kind nature has bestowed on the warm climates exclusively. But after them, the particular growth of some West India trees, which are not of the Palm tribe, deserve notice. To those belong the genera Theophrasta and Spathelia. They have a simple, very high, branchless stem, which in its whole surface is ornamented with bundles of leaves. How wonderful must be the appearance of a landscape with groups of such trees! A tree which grows in Africa, on the Senegal, presents the most irregular appearance, and without question is the thickest tree on the globe: it is the Adansonia *digitata*. Its stem is only ten or twelve feet high, but so thick that its diameter is found to be from 25 to 30 feet. Its circumference, therefore, is from about 75 to 90 feet. Its top is very remarkable; for numerous and thick branches, of from 30 to 60 feet in length, run out from it in all directions. We ought, therefore, not to be surprised that sometimes the hollow trunk of the Adansonia is the abode of several negro families. Not less wonderful is the tree called Rhizophora *mangle*, which bends its branches perpendicularly to the ground, and changes them into stems, so that one single tree covers the muddy rivers under the tropics of Asia, Africa, and America, for more than a mile, with a forest consisting of numberless stems, which at the top have the appearance of a close-clipped bower. But there are varieties of stems, which at first sight scarcely would be counted as such; and which also, in regard to the structure of their vessels, are different. The whole genus Cactus, with its varieties, is an instance of this kind. The different links which commonly are taken for leaves, are parts of the stem. The leaves themselves are subulate fleshy points, which on their base are covered with small prickles. They fall off, as soon as a bark is properly formed, and their former place is marked by the remaining bundles of prickles. The stem of some species of the genus Euphorbia, Cacalia, and Stapelia, is of the same nature. The links of the stem consist of a double net-work of air and adducent vessels; the whole is surrounded with a dense cellular texture, or a fleshy substance, and the cutis itself has net-work of lymphatic vessels with apertures. The thorn, is, with regard to its anatomical structure, to be considered as a ligneous stem, and does in no respect differ from it. It arises generally from an incompletely evolved bud, which has begun to form itself, but wanting a proper supply of nourishment, remains only in form of a very short, sharp, and bare twig. It is like the woody stem of a tree or shrub, formed of the air and adducent vessels, which have grown completely hard. It therefore remains fixed, though the bark be taken off. That it arises from a want of food, is easily proved by the cultivation of thorny plants. Most species of our fruit trees have thorns, but having been supplied in our gardens with extra food, the thorns become boughs, and at last disappear entirely. Only such plants as the Black Thorn, which are almost covered with thorns, do not lose them entirely by that treatment, though the number is always diminished. Nearly the same thing takes place in thorns which are not formed from imperfectly evolved buds, but are other parts of plants, changed in their appearance. Sometimes the petioli of pinnate leaves, when they remain after the leaves have dropped off, become thorns, as in Astragalus *tragacantha*, and other species of that genus. On the petiole they grow larger, sharper, and assume, after the flower and fruit have fallen off, the shape of thorns; for instance, Hedysarum *cornutum*: or lastly, the stipulæ become sharp, ligneous, remain, and change into thorns; for instance, in the Mimosa. Such changes, which frequently occur, especially in Oriental plants, remain uniform or constant. The prickle, is a prolongation of the cutis, and can therefore be taken off along with it. This consists of reticular, more or less ex-

panded, adducent vessels, and a few air vessels, and is covered with the vascular cutis. The most careful cultivation cannot convert a prickle into a shoot, as its air vessels become very rapidly ligneous, and separate from the inner bark, and it is therefore only kept from dropping off by the covering cutis. Prickles have sometimes a peculiar shape; they are almost of the shape of contorted tendrils in Nauclea *aculeata*, and other plants. Even the stipulæ of some plants are converted into prickles; for instance, Robinia *pseudacacia*, Berberis *vulgaris*, &c. Tendrils have the same structure of vessels, in herbaceous stems. They are, in fact, petioli, without the leafy expansion, but which, having not wasted their sap in the formation of leaves, have grown longer, and on this account have become too feeble to keep their straight direction. Hence arises their twisted shape. It appears, as if the diminished force of the current of air had a particular influence upon the tendril. For each plant that supports itself by tendrils, when distant from a wall, tree, or shrub, sends out all its tendrils towards that side on which the plant is to attach itself. At least this phenomenon can scarcely be explained in any other way. The pith which is found in the centre of stems, is a spongy cellular texture, which commonly is of a remarkably splendid white colour. It is not the least different from cellular texture, and in no respect like the spinal marrow of animals. Nature seems to have provided plants with it on purpose to deposit in it a store of moisture, that they may not suffer during drought. Hence all trees and shrubs have it; but as soon as they grow older, they need it no longer, the wood being an excellent substitute. On the same account it is unnecessary in water plants, as they very rarely suffer from drought; all of them have a hollow stem, without any pith. The gem or bud is the embryo of a future branch, and its anatomy therefore perfectly coincides with the anatomy of the stems and leaves, as they are inclosed in it in small compass. The period of their formation differs in different plants. In cold regions the bud is formed in autumn, covered with a great many scales, and so prepared for the mild spring. In warm and hot regions this is different; there no pernicious frost destroys the blossoms of the spring, and cold does not impair the vital power of the vegetable creation, therefore no precaution was necessary. The buds unfold themselves immediately from the bark into branches, without having remained there in the form of buds for any length of time. However, we meet with exceptions to this rule. Hot climates too, have some bud-bearing plants; and we possess a few shrubs, especially the Rhamnus *frangula*, which never buds. Each bud unfolds a branch with leaves, which at the base of each petiole again produces buds. In this manner their growth continues. But this evolution of buds from buds, would continue without stopping, were it not so regulated, that each bud, as soon as the blossoms and fruits are perfectly formed, decays. The evolution of the flowers, and afterwards of the fruit, constitutes the invincible barrier to the growth of the branches. Each bud, like all vegetable productions, is formed by the spiral vessels. Cutting a bud in a transverse direction, a white spot appears, continued to the very extremity of the bud, and this snow-white continuation is nothing else than a bundle of air vessels. If the same is done at an early period, an elongation of a small bundle of the spiral vessels is found. The leaves are composed of the same vessels of which the root, stems, and other parts of vegetables, consist. But the manner in which they are disposed presents a remarkable difference. A great bundle of vessels enters the base of the leaf, and divides on its surface in a reticular manner, anastomosing like plants. On this anastomosing of the vessels of leaves depends their form; and as it differs in each plant, we need not be surprised at the diversity of leaves. If the large vascular fascicle divides into three great divisions, a triangular leaf is formed; if it divides into more, then we see all the species of compound leaves arise. If, for instance, the vascular fascicle at the base of the leaf splits into smaller ones, a nerved leaf is formed. But if it run straight forward, emitting single fascicles on its sides, then we have a veined leaf. If there are on the margins of the leaf numerous anastomoses, such a leaf is then called *folium integerrimum*. But if the fascicles spread in small unconnected branches towards the margin, the leaf becomes, according to circumstances, serrated, dentated, crenate, and so forth. These bundles of vessels in leaves are composed of air and adducent vessels. The net-work they form, is in both its surfaces covered with cellular texture, in which the reducent vessels lie. And the external membrane, or cutis, which on both sides invests the cellular texture, is provided with innumerable lymphatic vessels, and their exhaling pores. The footstalk of leaves resembles in its structure that of the stem, except that the air vessels on its base by their convolutions form a knot, which serves for the evolution of the bud, their direction being thus changed. This knot is of the same nature as the supporter of a bulb. In rooty plants, radicles are observed to shoot out; as also in sessile leaves, or such as want the footstalk, we seldom find such a knot, and therefore they will not always produce buds at their base. Of all the parts of plants, the leaves shew a particular irritability; especially in compounded leaves. Merely by touching the leaves of Mimosa *pudica*, *sensitiva*, *casta*, Oxalis *sensitiva*, Smithia *sensitiva*, and many others, they instantly contract. If single leaves, or the main footstalk, be touched, they remain contracted for some minutes. Almost all triangular leaves, and leaves which are composed of several small ones, contract at night, like the above plants, in such a manner that one leaf covers the other, and the whole becomes compressed. Whoever will take the trouble to examine the plants of a garden at night-time with a lantern in his hand, will find several of them in this state, which has been called sleep. There are plants which, at a certain hour in the day, open and close their leaves. Du Hamel made experiments with the Mimosa *sensitiva*, which at a certain hour in the evening shuts its leaves, and again at a certain time opens them. He put this plant in a leathern trunk, covered with woollen blankets, and found that its leaves opened at a certain hour in the morning, and again were shut up in the evening. It has been alleged, that this phenomenon varies in its period, when going on in vacuo. A South American shrub (Porliera *hygrometrica*,) uniformly contracts its feathered leaves whenever it is going to rain, and is the surest foreteller of the weather that one can have. A plant which grows in the marshes of South Carolina, Dionœa *muscipula*, has a singularly constructed leaf. At the apex of a lanceolate leaf an elongation is seen armed with short prickles, which as soon as an insect or other small body is put upon it, shuts itself, and does not open till the body caught by it becomes quiet. The species of Drosera *rotundifolia* and *longifolia*, the leaves of which are planted on their margins and surfaces with petioled glands, contract, according to Roth's observations, when stimulated, though very slowly. A species of Filix in North America, the Onoclea *sensibilis*, has got this appellation merely from the circumstance, that its young leaves, when they begin to unfold themselves, shrink upon the least touch. In other respects, this plant shews no symptoms of irritability. The Nepenthes *distilla-*

toria, growing in Ceylon, has on the apex of its leaves a leaf-like *ascidium*, which at times opens and closes, and is even filled with water. This takes place also in a species of this genus indigenous in Amboyna. Of all plants, however, in this respect the most singular is the Hedysarum *gyrans*, growing on the banks of the Ganges. It has trifoliate leaves, of which the central one is larger than the two others. All these leaves move spontaneously. The large one rises backwards, up and down, the two smaller leaves at the sides have the same movement, only somewhat vigorous. Laying hold of these leaves, and then removing the hand, quickens their motions, as if they were to make up for the lost time, till at last they return to their former slower motion. No particular stimulus seems to act on them, and they do not contract like other irritable plants. Nor does this motion of the leaves depend on sun-light, for they move in light as well as in the dark, even when the plant is perfectly asleep. It is besides remarkable, that the leaves in the height of erection, and during very warm days, like the animal muscular fibre, have a tremulous motion. The stipulæ and bracteæ agree perfectly with the leaves with respect to anatomical structure. The floral leaves are sometimes coloured.

"From what has been said respecting the internal nature and chemical constituents of vegetables, and from the general observations which have been made, we are enabled, as far as these remarks extend, to form some conclusion respecting the vital process in plants. Like animals, they are provided with vessels, which contain juice; they are susceptible to the application of stimuli, and thus are irritable; they also correspond with animals in their evolution and formation. Hence we might infer that they must have a circulation of sap. In our days, hardly any one will support Jampert, in his attempt to prove, on mathematical principles, that plants have no vessels, as their existence has been fully ascertained by Grew, Malpighi, Mustel, Moldenhawer, Hedwig, &c. &c. and as every one who doubts may be convinced of this truth by ocular demonstration. Physiologists, however, do not agree in every respect. Hales considered the motion of sap in vegetables as the ascent of a fluid in a capillary tube, and alleged that it was carried forward merely by attraction, such as by light and heat. Malpighi was the first who ascribed irritability to the vessels, and asserted that their diameter was contracted and enlarged. He even affirms, that he observed, in the spiral vessels, a peristaltic motion, similar to that of the animal intestines. But he must have been deceived here, as the spiral vessels dry immediately when exposed to the air, and roll together in consequence of their extraordinary fineness. Corti admits the irritability of the vessels. Under the microscope, he pretends to have observed in the vessels of sixty-five plants a motion of the juice from joint to joint; and he supposes that every knot in unison with its interstice has a peculiar circulatory system quite independent of the other parts. Miller adopted the opinion of Hales, that there was merely a rise and fall of the sap, without any fixed circular motion; that heat occasioned the rise, and cold the fall, of the sap. Walker, who attempted to investigate the motion of the sap in trees which bleed in spring, affirms, that in spring the sap first begins gradually to ascend in the root, and at last rises to the top, and that this depends on the temperature of the external air, but that the juices never descend. Owing to this, the buds at the extremity are developed first. The sap is supposed to ascend between the bark and the wood; but this effect is produced not by heat alone, but by its co-operation with an internal unknown cause. He does not absolutely reject the opinion of there being a circulation, but only supposes that the tree before its evolution has quite a different motion of sap from what it has when in leaf. Various conjectures have been formed by other physiologists respecting the circulation of sap in the vegetable kingdom. Some think that the sap ascends only through the vessels of the inner bark. Others assert that it ascends to the wood through the roots, and descends through the cortex. Of this opinion are those who have injected plants with coloured liquids. From their observations it would appear that the coloured juice proceeds from the substance of the root into the wood, and hence is communicated to the leaves, from which it finds its way back through the cortex. Brugmann has endeavoured to prove the irritability of vessels, by shewing that the amputated branches of the Euphorbia *lathyris* and *myrsinites*, which emit a great quantity of milk, cease to do so as soon as the cut part is anointed with a solution of alum and sulphate of iron, so diluted that it leaves no stain on paper. Van Marum repeated this experiment, but did not obtain the same result. Uslar, however, has observed that the amputated stalk of Euphorbia *exigua* and *sylvatica*, when immersed in a solution of alum or acetous acid, immediately, or at least in a short time after, ceased to flow. Van Marum demonstrates, by several remarkable experiments, the irritability of vessels. He poured an electric stream over the branches of Euphorbia *lathyris*, as well as through the whole plant of Euphorbia *esula* and *cyparissus*, for the space of 20 to 30 seconds. On intersecting them, it was found that they did not emit any milky juice, though, by compression, some of it was observed to drop. He made the same experiment on the boughs of the Ficus *carica*, which were exposed for 15 seconds to an electric stream. Girtanner asserts, that oxygen is a stumulus to plants; that oxygen has a closer connection with the vegetable fibre than with other bodies; that all bodies which rapidly absorb oxygen, are stimuli to plants, and must promote their growth. According to this theory, the experiments of Mr. Humboldt, which he made on the germination of plants, may be very well explained; and the observations of Ingenhouss and others, confirm the opinion that corn and other vegetables, in a bad soil, when sprinkled with well-diluted sulphuric acid, grow just as well as if they had been plentifully manured. We learn also from chemistry, that oxygen from the atmosphere very easily combines with the different species of earths and stone, particularly with vegetable mould. It is well known to every gardener and forester, that trees planted in spring grow so much better by having had their holes digged in autumn, which during the winter were exposed to the influence of the air. Experiments have also shewn, that soils which have been dug into loose heaps of earth frequently stirred, and then exposed for half a year to the influence of the air, produce a richer crop than if they had been manured, and retain this fruitfulness longer than by the application of manures. But, besides the mere oxygen, there are other bodies which act as stimuli upon plants. Most of these, however, appear only in an active state, for this reason, that they either contain oxygen or dissolve it. Well or river water, considered as an aliment, being decomposed in the vegetable process, sometimes also constitutes a stimulus. Rain water is much more beneficial to plants than any other, because, according to Hassenfraz's investigation, it contains more oxygen. Caloric is an excellent stimulus to vegetables, as it renders oxygen gaseous, and moistures more fluid: consequently the influence of this matter becomes more powerful; only, the degree of it must be proportioned to the vegetable fibre. Thus, plants at the tropics will sustain more heat than mountain plants, or those at the poles. Muriate of ammonia, according to Brugmann's observations,

promotes vegetation. The branch of a Service tree was put into pure water, another into a solution of muriate of ammonia; in 24 hours the former imbibed 5-12ths, the latter 10-12ths of the liquid; and hence we may draw the probable conclusion, that the muriate of ammonia, by its stimulus, increased the activity of the vessels. Nitrate of potash is used by the Dutch gardeners as a means of promoting growth. The bulbs of Narcissuses, Hyacinths, and other vegetables, grow much faster in water where this neutral salt is dissolved. Tromsdorf found also that a sprig of the Mentha *piperita* became 378 grains heavier in a solution of nitre, whereas a sprig in common water gained but 145 grains in weight. Barton, however, directly maintains the contrary, because a few grains of nitrate of potash killed a Kalmia. But it is easy to conceive that a moderate stimulus to some plants, may be over violent and destructive to others. Barton found that in water in which camphor was diffused, a decayed twig rapidly recovered, which did not happen when it was placed in common water. A decayed branch of Liriodendron *tulipifera*, and a withered flower of the yellow Iris, recovered in it, and remained long fresh. I myself tried this with a branch of Silene *pendula*, the flowers of which were quite shrivelled; in an hour's time I found the petals again perfectly expanded, as if just evolved. Is it the hydrogen of the camphor which stimulates the vegetable fibre to such a degree, as to produce this phenomenon? or is it a consequence of the composition of the camphor, that only the exact proportion of carbon, which is found combined with hydrogen in camphor, can stimulate the fibres? This remains to be determined. Light likewise is a very powerful stimulus of the vegetable fibre. Every body knows that hot-house plants incline their stalks and leaves always towards the windows. A plant which has been confined for days in a dark room, will, as soon as some light is admitted, however small the aperture be through which it passes, bend its stalks towards the light. Who does not know, that the species of Lupinus, especially Lupinus *luteus*, turn in the open air their leaves and stalks towards the sun, and follow its course in so steady a manner, as to enable us to specify the hour of the day from their direction? Light is farther of particular service to vegetables in promoting the decomposition of the absorbed water, and separation of the oxygen; for when this oxygen gas is accumulated in vegetables, all their parts become white, as may be seen from plants which vegetate in the dark. Even the light of a lamp effects the separation of the oxygen, as an experiment, of which I was eye-witness, fully proves, viz. that of Humboldt, who rendered Lepidium *sativum*, which had grown up in a dark cellar, green, by the faint glimmering of a lamp kept under it several days. All plants cannot support the stimulus of strong and constant light. There appears to be a determinate degree of this stimulus, which they cannot without injury exceed. As young plants are much more susceptible than grown up ones, they thrive best in the shade. All forest plants are destroyed by too much light. This is proved by the observations of Medicus, Desfontaines, and Uslar, who found that the irritability of plants is strongest in the morning, fainter at mid-day, and fainter still in the evening. Sennebier has made the experiment of separating the rays of light, in order to discover which of them is most favourable to vegetation; and he found, that plants of Lettuce grow best in the yellow, and next in the violet. Those on which the invisible ray fell, came nearest to those which stand free in the collected light. The irritability of the vegetable fibre is destroyed by all stimuli when they are too powerful or too long continued. Every stimulus must be proportioned to the irritability of the fibre; in proof of which may be adduced all subterraneous plants and all the species of Boletus: for the knowledge of which we are indebted to the researches of Scopoli and Humboldt. These plants require a very small quantity of oxygen to promote their growth, and therefore as soon as they are brought into the open air, they decay. This is even proved by the well-known observation, that rooms or repositories which are fusty or mouldy, are freed from this inconvenience by the admission of air. Opium will destroy the irritability of plants; by it the irritability of Hedysarum *gyrans* and Mimosa *pudica* was greatly impaired, and almost completely destroyed. Vegetables die very soon in carbonic acid gas; as well as in nitrogen and hydrogen gas. In the last of these, plants die immediately; but if it be mixed with a little oxygen gas, they live for a short while, and grow very luxuriantly. Mr. Humboldt, on the 14th February, 1792, put a germinating bulb of the Crocus *vernus*, which he had planted, into one of the celebrated mines of Freyberg, several fathoms under ground. In this mine, the air was so much contaminated with hydrogen gas, that his candle was extinguished, and his lungs became sensibly affected. The germ of the bulb soon evolved, the leaves became green, the flowers yellow, and the anthers even full of pollen; but on the 17th the whole plant suddenly began to putrefy. Several plants shewed the same result. The hydrogen gas cannot however be considered as a stimulus of vegetables, as in its pure state it kills plants, and only when mixed with oxygen shews the above phenomena. Plants live so long only, as they can exhale oxygen; when this stops, they are gone. In the same manner, Sennebier and Ingenhouss observed that plants confined in hydrogen gas, emitted oxygen day and night; but that when the oxygen gas was consumed, they could no longer subsist.

"The above numerous observations are sufficient to prove that vegetable sap is not put in motion by mechanical principles, but that it is carried forward by the irritability peculiar to plants. The ascent of sap in warm weather, and the descent of it in cold weather, can no longer be argued; but experiments, and the analogy between plants and animals, clearly point out a circulation. For how could the juices of trees, which during winter continue bare, without foliage, and without discovering any symptom of vegetation, be at all preserved, if in the long succession of cold weather the moisture which is found in the vessels were constantly to descend. We should at last necesarily find the branches quite destitute of fluid, which is never the case. Nor is the cessation of sap, or the congelation of it in very cold weather, more admissible. We know from experience, that when the juices of delicate exotic plants are coagulated by cold, they must die. The circulation of sap must therefore take place in them, as they cannot, on account of the unfavourable season, make new shoots still, and survive; and, though much less vigorous, they appear to exist in the same manner as hybernating animals, such as the marmot and dormouse, which, during the winter, like amphibious animals and some insects, fall into a profound sleep, and are awakened first with the returning warmth of spring. Experiments have not yet discovered how the circulation of blood in these species of animals adapts itself to the season of the year. What has been adduced as proof of the ascent and descent of the sap in plants, is the important, but altogether mistaken phenomenon, that after the middle of January, with us after the 20th, the sap enters trees. At this period it is thought to descend, to be ready in the spring. But whoever thinks that trees, shrubs, or herbs, are dead in winter, or without action, is much mistaken. During the whole summer, the

root sends the food, imbibed by its fibres, to the stem, and what the stem receives from the leaves is constantly employed in the formation of new parts, till either this evolution ceases, from the strength being exhausted, as in annual plants, or till the parts above ground, which can no longer resist the inclemency of the weather, become separated, as in herbs, shrubs, and trees. With the fall of the leaves in ligneous plants, and with the drying of the stem in herbs, all their vegetating powers are exhausted. The great quantity of moisture which the root forwarded to the plant, is consumed: in trees and shrubs, it is employed in the formation of branches, of wood, alburnum, inner bark, leaves, blossoms, and fruit, as well as in the formation of the root; in herbs, in the formation of the parts above ground, the fruit, and the root itself. These fibres, which hitherto conveyed the food, begin to become brittle, and are no longer able to serve this purpose. The sap which circulates in the vessels can no longer produce new shoots above ground, as the temperature is unfavourable. From the moment, then, that the leaves of ligneous plants and the stems of herbs decay, the plant begins to form new radicles in place of the old ones. If at this period, in the latter part of autumn till the middle of January in our climates, a Birch or Walnut is bored, no sap will proceed. The tree indeed has sap, but only as much as it just wants, and as suffices to form new radicles. Hence fruit-trees, which had too much fruit, decay, because their strength by the great waste of sap is too much exhausted. If such a tree or shrub has formed radicles, before the middle of January, those active young radicles perform their new functions. They imbibe moisture, which they deposit in the cellular texture, and collect in this manner as much sap as the wasting of the powers, which will be necessary in the next summer, requires. If at this time a stem is bored, a great quantity of fluid flows out in those plants which receive a superfluity. But if, at the end of January, or in February, the weather becomes mild, this flow of sap ceases altogether, and trees, if then bored for the first time, give no sap; a stream of it is observed again when the weather becomes cold. Those who adhere to the theory of ascent and descent of the sap, say, that in warm weather the sap ascended too high, and in cold descended too low. This singular change, however, of its flowing and ceasing to flow, depends on this, that as soon as the weather is fine and mild, the transpiration of plants goes on with greater rapidity; the quantity of the sap, therefore, naturally becomes less; on the contrary, in cold weather the transpiration is not considerable, and therefore the sap accumulates. On this account the roots of herbaceous plants which are collected for medicinal purposes, are more efficacious in winter and spring, than in summer, when in full leaf and flower, because, at that time, they have prepared new sap by their young radicles. The circulation of sap in vegetables, cannot be of the same nature as it is found in quadrupeds, birds, fishes, amphibious animals, and insects; else, we should observe a point from which all the fluids proceeded, and where they again meet together. Were there such a circulation, the Willow could not reproduce new stems from every little branch. The circulation of sap, then, must resemble that which takes place in the polypi, as these also may be dissected into several pieces, from each of which new polypi are again formed. The nature of circulation must be extremely various in the different classes of vegetables: Impatiens *balsamina*, being a meadow plant, whenever it is without water, immediately withers away; but when water is poured upon it, in five minutes after all the leaves and the trunk again stand erect. A tree or shrub will not recover so quickly. I observed a Cherry tree, the stalk of which was broken immediately under the top, and in which the top was attached to the stem only by a small stripe of bark. It was immediately fastened; the buds were just opened, but the flowers were still confined; in about eight days after nothing was observed at the top, it bloomed rather more luxuriantly, but in a short time all of it decayed. I have observed also in the broken-off branches of fruit-trees, that the fruit became ripe; and also that fruit-trees, the stems of which were frozen, still continued to vegetate, till towards the middle of June; they then decayed. Thus the juice of trees, which is imbibed by the root, appears to be long in reaching the upper part. We must then take for granted, that small coherence by means of the bark in the broken top of the Cherry tree, and in the bough of the fruit-tree, had, as well as the still living wood of the congealed fruit stem, conveyed out of the root a sufficient quantity of sap for some time. Be that as it may, it is certain that the sap of the root is much longer or slower in reaching the top of ligneous than of herbaceous plants. A shrub, the roots of which are decayed, or consumed by insects, will for a long time have discoloured leaves, and yet live; and will even vegetate some time after its root has been destroyed. It is highly probable, that the circulation of vegetables is very complex; and Corti may not be far wrong when he ascribes a circulatory system to every knot of plants. We may therefore suppose that the root imbibes the fluids, which (on the admission of heat, and the gases produced by it, are formed by the adducent vessels, particularly those that twine round the air vessels) are communicated to the reducent vessels by means of the cellular texture; and are again conveyed into the posterior adducent vessels through the same channels, rising by degrees higher and higher till they reach the stalk. Here every knot that envolves a bud, appears to form, with the leaves, a circulatory system, which by means of the passing adducent and reducent vessels, and of the cellular texture, is united to all the other systems, and to the whole plant. According to this principle, I may cut off from the stalk, a small slip, which has only one knot, one bud, and one leaf, and by placing it loose in the ground, render it a plant. As the slip which has its own peculiar circulation is separated from the common circulating system, it will be for a period in a state of inaction, without evolving any new leaf, but in a short time, the vessels, which exist in this part of the stalk, viz. in the knot, the bud, and the leaf, begin to form a callus below, sending out new parts that become roots; these young roots soon imbibe nourishment, the bud is evolved, and becomes a young plant, in which again several systems of circulation are found connected with the whole. The following observation may serve as a proof that every knot has its circulatory system: If, in a young sprout, I cut the knot on which the bud stands, it will not grow, or produce a new plant; neither will a piece of the stalk grow, in which there is no knot with the bud. As far as our observations extend, the circulation of sap cannot be explained in any other manner. That, according to the differently formed plants, there are more or less anomalous circumstances or exceptions, is easy to be supposed. But of what nature is the circulation of sap in ligneous plants during winter? In all probability, the juices continue to be moved in the same general manner, and to be renovated from the root: their circulation of fluids, however, is slow, because no new parts can be formed in the open air, and because the transpiration is considerably diminished. The nourishment requisite for vegetables, is not all derived from the soil in which they are planted, the greatest quantity being obtained from

the atmosphere. Shrubs, trees, and succulent plants in particular, receive most of their sustenance from the air: dew, mist, and rain, are also rapidly absorbed by them. The secondary vessels properly perform this function; so do all fine capillary elongations. Thus the green stalk, and the under surface of the leaves, chiefly absorb these moist vapours. Bonnet demonstrated this last fact by a beautiful experiment. He placed a leaf of the White Mulberry tree, with its upper surface upon water, and it continued six days fresh and green. A leaf of the same tree, which was laid with its under surface upon water, remained for six months fresh, and in good condition. Plants imbibe gases also, otherwise it would be impossible to explain whence they derive the great quantity of carbon, of which they principally consist.

"The function of transpiration is performed by plants through apertures which are surrounded by the lymphatic vessels. Bonnet anointed leaves with oil, by which means the process of transpiration was completely suppressed. They assumed a black colour, and decayed. I observed the same thing in a hot-house plant, the leaves of which being oiled in order to destroy the aphides, all fell off. Plants which have been exposed to the dust, by the continuance of drought, lose the leaves, merely because their pores are obstructed. The number of the pores which are found on the whole surface of a plant, is by no means insignificant. Hedwig enumerated five hundred and seventy-seven in one single quadrate line, on the surface of a leaf of the Lilium *bulbiferum*. Thus, according to this computation, a square foot would have nine hundred ninety-eight thousand seven hundred and forty-five. How many square feet of surface must a plant present to the air, and how great must be their number in a full-grown oak! The transpiration of plants is twofold, aqueous and gaseous. The aqueous is considerable; Hales made many experiments, which clearly prove this assertion. A plant three feet high, lost in one hour, 1 lb. and 6 oz. during the night: if no dew fell, it sustained a loss of six ounces; but if dew fell, the leaves had imbibed 4 or 6 ounces of moisture; whereas in the day-time the transpiration was always very considerable. Watson exposed a glass of 20 square inches within, to very warm sunshine, in a place where it had not rained for several months, and turning it round upon a plot of mowed grass, he found it full of drops of water, which ran copiously down; he collected them by an exactly weighed piece of muslin, and repeated this experiment for several days, between 12 and 3 o'clock; hence he was enabled to calculate that an acre of ground transpires in 24 hours, 6400 quarts of water. Brugmanns observed a particular kind of aqueous transpiration in the roots of some luxuriant plants; he had put some plants of this kind into a glass filled with earth, and observed at night a drop of fluid in the top of the radicles; he remarked as soon as such a drop touched the roots of other plants, they dried immediately. If this happened frequently, the plant decayed. Thus Oats, (Avena *sativa*,) were destroyed in this manner by Serratula *arvensis*; Flax, (Linum *usitatissimum*,) by the Scabiosa *arvensis* and Euphorbia *peplus*; Wheat, (Triticum *æstivum*,) by Erigeron *acre*; Buck-Wheat, (Polygonum *fagopyrum*,) by Spergula *arvensis*; Carrots, (Daucus *carota*,) by the Inula *helenium*. Hence he concludes, that weeds with the fluid dropping from their radicles, suppress the growth of the contiguous plants. But might not the weed destroy the cultivated plant, owing to its absorbing the alimentary matter with greater rapidity, and expanding sooner, and thus prevent the further growth of the adjacent plant? Drops are also frequently observed on the leaves of quick-growing plants, particularly on the top. The gaseous transpiration of plants was first discovered by Bonnet in 1754, after him by Priestley in 1773, and next by Ingenhous in 1779, afterwards by other celebrated philosophers, Sennebier, Scheele, Achard, Scherer, Succou, &c. &c. No branch of the physiology of plants has produced more numerous experiments. The following are the results of all these laborious investigations: Plants in sun-shine emit a great quantity of oxygen gas, but at night exhale a kind of air which is unfavourable to animal respiration. The quantity of this, however, is much less than that of the oxygen lost in the day-time. Thus a constant circulation takes place in the atmosphere, the plants improving the air which has been spoiled by the breathing of animals. The surface of leaves, all green stalks, and in general the green part of vegetables, exhale oxygen gas in sun-shine, but particularly green water-plants, Pine-trees, Gramina, and many succulent plants. The leaves of trees emit less of it than herbs. No oxygen gas whatever, even when exposed to the sun, is emitted from Ilex *aquifolium*, Prunus *laurocerasus*, Mimosa *sensitiva*, Acer *foliis variegatis*, the petala, ripe fruits, the bark of trees, the pedicels, and the ribs of leaves. The gas which is emitted during night is by far less in quantity, either pure carbonic acid gas, or, as in most cases, often mixed with hydrogen, sometimes also with azote.

"Water is the chief nourishment of plants. They absorb it out of the earth by their roots, and above the earth they imbibe all the moisture which exists in the form of vapour. The light by its stimulus resolves water into its constituents, hydrogen and oxygen. The oxygen combines with the caloric, becomes gaseous, and conducted by the air-vessels runs out from the pores of the leaves. The hydrogen combines with carbon, which plants likewise absorb, and with several elements which the vegetable body receives in various proportions, according to its organization, and forms the juices and other substances peculiar to vegetables. At night, when the light cannot effect the decomposition of water, combinations and separations of another kind take place, and for this reason plants then discharge carbonic acid and azotic gases. The little oxygen which remains cannot stimulate the fibre so powerfully, consequently the quantity of transpired matter is much less. The stimulus which the oxygen, separated by the light, has exerted upon the fibre, occasions a relaxation, by which the sleep of plants, or folding of the leaves, is produced. Light is absolutely necessary to plants, as it nourishes them by means of its influence. If we except subterraneous plants, and some species of Boletus, the vegetation of which is regulated by other principles hitherto not investigated, vegetables cannot exist without the influence of light. The direction and proper situation of the parts in every species depend entirely upon it. Plants also, which affect the shade, require light, but that only in a moderate quantity; the rays of the sun would stimulate them too violently. Young plants, as well as most of the Cryptogamous class, require defence against too powerful light, but cannot live without its influence. Trees, and the most of the Gramina, need a great deal of light, and hence all trees have a greater tendency towards the south than towards the north. It is by the decomposition of water that the temperature peculiar to plants is produced. Philosophers, however, are not entirely agreed in their explanations of this phenomenon. Sennebier and Hassenfratz assert that the oxygen, being set free by the decomposition of water, unites with the caloric of the vegetable fibre, and flows in a gaseous form from the pores of the vessels. Von Humboldt, again, supposes that plants absorb caloric from the atmosphere, and combine in the air with the oxygen, which is separated by the influence

of light. He believes that in this manner the cooling shade of trees may be accounted for. The functions of absorption and exhalation appear to take place in Mushrooms according to their principles. This, however, needs to be confirmed by future observations. Agaricus *campestris* and *androsaceus*, continually exhale hydrogen. Oxygen appears to be a stimulus to them, as the most of them when immersed in hydrogen and azotic gas are soon destroyed.

"How the matters which are absorbed by plants are assimilated, that is, are combined into the juices peculiar to the vegetable world, is a mystery to us. In none of the organized bodies have we hitherto been able to explain this assimilation, though there has been no want of theories upon the subject. Some account for this beautiful operation by mere contraction of the parts; others, by the form of the active organs; others again, by the form of the substances; but these are all very unsatisfactory hypotheses. This much, in the mean time, appears certain, that the proportion of the parts, as well as the formation and direction of the organs, and the greater or less irritability arising from them, may produce the various mixtures. But how comes it to pass, that every part of a plant frequently differs in taste and in smell? Thus the root of the Mimosa *Nilotica* smells like Assafœtida, but the flower emits a very agreeable odour. The stem exudes the bland well-known gum arabic, and the juices which it contains are sour and astringent. Manure operates only as a stimulus on the fibre of vegetables, so that they are enabled to absorb carbon the more rapidly, and all the constituents are first composed. This is particularly evident from the above related experiments, where delved earth, saturated with oxygen, as well as ground sprinkled with diluted sulphuric acid, made plants grow more rapidly than a great deal of manure laid upon the earth. The vessels appear particularly to prepare the juices, as fluids have been found completely prepared in the cellular texture of the root. It seems, however, as if the receptacle of the manures in the cellular texture concentrated them still more, and that this also contributes its effect to their preparation. Thus as glands prepare in general oily, seldom mucilaginous fluids, a great quantity of glands is therefore found in the leaves of all fragrant plants. Sometimes this oil abounds so plentifully in the glands, that it may be separated from them by mere pressure; as in the rind of Citrus *medica*, *aurantium*, &c. and in the leaves of Melaleuca *leucodendron*. Vessels which are still young, are the most active in plants. As soon as they begin to pass into alburnum or wood, the circulation of their fluids is in a sensible degree slower. Thus the chief seat of life, particularly in ligneous plants, is to be sought for in the inner bark. Hence trees become strong and large when they receive no external wound on the stem, so as to injure the inner bark. Trees, the bark of which was frozen in severe winters, will decay, whereas those which lose their pith by cold, without their inner bark being affected, may continue to grow without sustaining any injury. Where the layer of the inner bark, which as we know is composed of vessels, is thinnest, the growth is most rapid, and leaves are also formed. For this reason, thin branches are provided only with leaves. The inner bark begins in the alburnum, *i. e.* there are new vessels situated in the alburnum, which as long as they form a thin delicate layer easily separable, are called inner bark. This layer, however, hardens into alburnum, and at last into wood. Duhamel saw no connection between the cortex and wood of a Willow-tree. He found, however, a moisture, which in the air became mucilaginous and tenacious; this he, with Grew, called Cambium. He alleges that it is the formative organ in plants. He took away from a Cherry-tree in full bloom all its cortex longitudinally, and covered it closely with a layer of straw; many of the leaves fell off, some of the branches withered, and no fruit was produced. The tree continued diseased next year, but in the third summer it again acquired bark. Had the young wood, deprived of the stem which is full of moisture, and which had lately, for the first time, formed the new layer of inner bark, not been preserved from the access of the air, the juice would have dried up, and the tree been destroyed; but the covering of straw inclosed it as well as the cortex, and it again formed the same layer of inner bark with the cortex. The hardened fibres of vegetables, comprehended under the general name of Wood, have, however, different degrees of hardness in proportion as they confine carbon by the power of their organization, and the harder the wood proves, the slower is the growth of the tree or shrub. The firmest and hardest woods, have, therefore, the most carbon, and require a long time for their perfect vegetation; as, the White Beech, (Carpinus *betulus*,) the Red Beech, (Fagus *sylvatica*,) the Oak, (Quercus *robur* and *pedunculata*,) the Cedar of Lebanon, (Pinus *cedrus*,) Adansonia *digitata*, &c. &c. There are, however, exceptions to this rule; as Robinia *pseudacacia*, which grows very fast, and has firm hard wood. Every shrub or tree with us, forms annually two shoots; the one, which is the chief shoot, evolves in spring, the other is not so strong, and appears towards the longest day, about St. John's day, from which it has been called St. John's shoot. The first is formed from the quantity of juices which the root has imbibed during winter. The second, from the moisture imbibed during the spring. In the torrid zone, both shoots are equally strong, and hence plants there grow much more luxuriantly.

"The green colour of the vegetable creation is a most refreshing sight. The investigation of its cause has long occupied the attention of philosophers, and given rise to many hypotheses. When phlogiston still had a number of adherents, the explanation of the green colour was very easy, as it was considered as an effect of this principle. Since, however, the idea of its existence has been given up, different kinds of explanation have been devised. Berthollet observed, that the green of plants is not composed of blue and yellow, as the prism does not analyze their green, like that of other bodies, into yellow and blue rays. After extracting with alcohol the green colour from the leaves, and exposing this mixture to the sun or atmosphere, the green colour disappears entirely. The oxygen of the atmosphere combines with the mixture, and banishes the colour. If a solution of ammonia, which consists of hydrogen and azote, be dropped into it, the latter separates the oxygen from the mixture, and the green colour is restored to it. From all the observations on this point, it follows, that leaves, from which the oxygen has been withdrawn by means of light, are green, but have a pale or whitish colour where the oxygen is accumulated. The mixture of hydrogen and carbon is now considered by chemists as the cause of the green vegetable colour. The dark colour of the cortex in woody plants is, according to Berthollet's observations, produced by the oxygen of the atmosphere. Mr. Humboldt repeated his experiments, and found that wood, when enclosed in oxygen gas, became black in two or three days, and the gas was mixed with carbon. It appears from this, that the oxygen of the atmosphere combines with the hydrogen of the vegetable fibre, and sets the carbon free, which shews its particular black colour.

"The leaves of plants are of various duration. Most of

them in warm climates remain from three to six years on the branches. A few in colder climates, and only those which have a tenacious sap, as Ilex *aquifolium* and Viscum *album*, or such, which have sap of a resinous nature, as all the Pine-tribe trees, retain their leaves during winter. All other plants of the colder climates drop their leaves in autumn. This happens in many different ways. Some leaves decay gradually, and fall off, or remain on the stem in a dry state till spring; others fall off when still green, even in the mild serene days of autumn. In quite a different manner the Robinia *pseudacacia* parts with its leaves. The pinnate leaves of this tree first drop, then all the pinnulæ, and at last, after them, the petiole to which they adhered drops off. The cause of the falling off of the leaves is this: During the summer the vessels of the petiole become gradually ligneous, as the sap is conveyed to them in greater quantity, and the whole frame of the leaves gets a more ligneous consistence. The sap must in consequence gradually stagnate, and at last the communicating substances between the stem and the petiole are completely shrunk. The wound which the stem thus receives cicatrizes before the petiole separates. The connection now interrupted between the leaf and the stem, and their vessels, causes the petiole, by which they are connected, to separate entirely, and thus, especially in calm serene weather, the leaves unavoidably fall off. For as the rays of the sun still favour the last decomposition of the water, and the reducent vessels cannot convey the small quantity of moisture to the knot of the petiole, the motion of the small quantity of sap naturally remaining will cause some sort of concussion, which is sufficient to occasion the fall of the leaf. In the Oak-tree the leaf cannot fall off in autumn, as the vascular fibre of this tree is very tenacious, and on this account the connection between the knot of the petiole and the stem is not broken. In the Robinia *pseudacacia*, the small and tender petioles of the leaves first are closed up, and separate of course earlier from the common petiole, which is still succulent enough to remain a short time, but soon, as without the leaves it cannot subsist, has the same fate. It depends, therefore, entirely on the nature of the leaf, how long it is to remain on the stem, and by no means on the weather. The peculiar organization must not be overlooked, as it really has a powerful influence.

"The growth of the plant ends with the evolution of the flower. When a plant has acquired a certain degree of firmness, (which, as they are so multifarious, does not happen in each at the same time, or in the same age,) it then becomes capable of propagating its own species, and that part which we call the flower is now formed. Its speedy appearance in herbaceous plants, may generally be observed from the circumstance, that the minute scaly leaves grow gradually less, till the smaller and more delicate parts of the flower are at last unfolded. Gœthe is therefore not mistaken, when he calls the growth of plants a contraction and expansion; an idea which Wolfe already has endeavoured to prove. The flower is, as all the other parts of plants, formed by spiral vessels, which, as soon as the first rude sketch, as it were, of the flower exists, are already observable. Linneus formed a very erroneous idea on this subject. He considered the pith of a plant, which he believed to be of equal importance with the spinal marrow of animals, as the sole formative organ in the whole vegetable kingdom. Vegetation in general, according to his opinion, went on by means of the pith. The seed itself was a small piece of pith, which separated from the mother plant, on purpose to go through the same revolutions as the old plant had done. But he proceeded still farther, and ascribed to each part of a plant a certain peculiar power in forming one part of the flower. The calix was formed by the bark, the corolla by the inner bark; the stamens were formed by the wood, and the pistils by the pith. He carried this ingenious hypothesis still farther, by asserting, that in ligneous plants each branch required five years for the final evolution of the flower, and that each year something was added to the future flower. In the first year, for instance, the scales are formed, when the branch is shooting out from the bud; in the second year the calix; the corolla in the third; in the fourth the stamens; and in the fifth the whole, for the formation of which nature required all that time, is completely evolved. Linneus may be right so far, that plants require a certain time to blossom; that in them previously a great quantity of sap, which has been so carefully elaborated, as to become capable of forming parts so important for the continuation of the species, is first laid up; but that every year any one part of the flower, as an effort, is produced, would be very difficult to prove. As little can we suppose that the pith alone is the only formative part in plants. It is clear from the account of its use and design, that it may be wanted; which is contrary to the old opinion. But that the cortex, inner bark, wood, and pith, &c. should each form a peculiar part of the plant, is so much against common experience, that it is hardly necessary to refute it. We find in the springing flower, elongations of spiral vessels, but we never see elongations from each particular part, one forming the future calix, another the corolla, and so forth. For instance, in the Common Sun-flower, (Helianthus *annuus*,) where on a large receptacle, numerous small flowers are placed, how should those elongations be able to unfold themselves into florets from the bark, inner bark, &c. through such a receptacle? There would arise a confusion amongst those small parts, which is never met with. Further, how should the stamina be produced in herbs, which are not ligneous? or the pistil, in plants which have no pith? Who does not see that all these assertions are mere hypotheses, which may be refuted even without the aid of anatomical investigation? The flower does not always appear in the angles of the leaves or at the extremities of the stem, but in some plants it shoots forth in very uncommon places. Rohria *petioliflora* has its flowers situated on the petiole. This is also the case in Salsola *altissima*, and some other plants. In most species of the genus Ruscus, the flower is found in the middle of the leaf. Most species of Phyllanthus, Xylophylla, Polycardia, and one species of Ruscus, R. *androgynus*, flower on the margin of the leaves. On branches which are leafless appear the flowers of Cynometra *ramiflora*, Ceratonia *siliqua*, Averrhoa *bilimbi*, and A. *carambola*, Bœhmeria *rumiflora*, and other plants. Most remarkable is the station of the flower in a tree of the East Indies, called Cynometra *cauliflora*. This very leafy tree has no flowers but at the foot of its stem; its leafy top never produces any.

"The flower, consists of the calix, corolla, nectary, stamens, and pistils. The calix and corolla are, in point of the distribution of their vessels, exactly like the leaves. The calix, when green, transpires, like the leaves, oxygen gas in sunshine; but when it is coloured this does not take place. Both these parts imbibe their necessary support from the air, and convey it to the receptacle on which the flower is placed. The functions of absorption and transpiration are performed by the leafy parts of the flower as well as by the leaves of the plants. Only the coloured flower emits other gases. Hitherto it has not been determined, whether the phenomenon which the Dictamnus *albus* presents in warm serene summer nights, when there is no moonshine, is produced by hydrogen gas,

or by the transpiration of a fine volatile oil. If this blooming plant is in abundance, and about this time is moved suddenly through an extended space, and if immediately adjoining there be a piece of burning paper, a fine blue flame, which may be easily extinguished, is instantly emitted. The daughter of Linneus observed in the Tropæolum *majus*, and other flowers of a deep orange colour, an electric spark, during the dark and serene warm summer evenings.—The nectaries, when they do not consist of mere glands, agree in structure with the corolla.—The stamens consist of the filament and anther. They are likewise called the male organs of generation. The filament, in the distribution of its vessels, sometimes resembles the herbaceous stem, sometimes the leaves, according to the variety of its shape, which differs very much, but in each plant commonly bears a peculiar and constant character. The anthers are formed of a thin but vascular membrane, filled with pollen. The pollen occurs under a variety of forms, which can be seen only with a microscope. Jussieu, Duhamel, Needham, Gleichen, and others, observed with a high magnifying microscope, that the grains of the pollen, when brought in contact with water, burst with a degree of violence, and emit a gelatinous mass. Kœlreuter, on the contrary, assures us, that ripe pollen does not burst suddenly when wetted, but slowly emits through its pores, or, if provided with small prickles, through those, an oily fluid, which on the surface of water forms a distinct shining pellicle. He says further, that each single granule of the pollen consists of two membranes; an external one, which is thick, elastic, cartilaginous, and full of very delicate vessels, in which last are the pores which emit the oily liquid; and secondly, an internal very fine membrane. The internal surface is lined with a very tender, elastic, cellular texture, which contains the oily impregnating mass. Hedwig, however, after his latest researches, does not agree with Kœlreuter. He says, that each granule of the pollen consists of one vascular membrane only, filled in its interior with a gelatinous mass, but has no cellular texture whatever; and, according to him, the pollen emits this fluid at once; it does not exude out through pores. Hedwig examined that portion of pollen, which had on the female stigma performed its functions, and he found this observation confirmed. Even the stamens of the Mosses are, according to him, only granules of pollen acting as the others. He finds a great similarity between this fructifying mass and the semen of animals; only that, as well as in the animal kingdom, it differs in consistence in different species. Most observations indeed coincide in this, that the moisture which is contained in the pollen, is not oil, but a mere gelatinous mass, which, however, cannot easily be mixed with water. It is, however, likewise proved by experience, that this mucus contains a considerable quantity of oil, for an oil may be obtained from the pollen by pressure, as it takes fire when thrown into a flame, and, finally, bees prepare their wax from it. It does not however follow, that the whole is oily; for an almond cannot be called merely an oily substance because oil may be obtained from it; it contains this oil in a gelatinous mass. As in the animal kingdom, a more important question, What constitutes the impregnating power of the pollen, or on what does it depend? remains still unanswered. Is it a subtile oily vapour, or a subtile volatile aura? or is it, according to others, electricity, or any other power? Still we are here in the dark.—The female organs of fructification are the pistil, which consists of the germen, the style, and the stigma. The germen varies in its shape and structure in various plants. It is composed of all those vessels which we noticed in the rest of the plant; their direction and distribution only differ in each. The seeds, if the germen itself does not become a seed, are situated in it, and are connected with it by the umbilical cord. In its interior, it contains a clear fluid, in which nothing particular can be perceived. When the germen is converted into a seed, the umbilical cord hangs together with the receptacle, and is very short. The internal structure of such a germen, is the same as that of the seed contained in the germen. The style appears under a variety of shapes. All the known vegetable vessels compose it, and it has hollow tubes, which at the top are, by a tender cellular texture, connected with the surface of the germen, and with the cord of the seed. Hedwig, in his microscopical researches, found in the species of gourd, and its kindred plants, on the stigma, hollow channels, in which he detected a firm, yellow, gelatinous body, which in the gourd was quadrangular, ran through the whole extent of the style, and ended in the umbilical cord of the seed. It appeared impenetrable, and incapable of carrying any fluid. But as, unquestionably, it contributes to the fecundation of the pollen, either as a conductor or as a conveying medium, he calls it *conductor fructificationis*. Its use, however, is yet concealed from us; and it is even not yet precisely ascertained, whether other plants have it, or if a different regulation in them answers the same purpose. The stigma consists of hollow absorbent channels, the structure of which is observable only with the microscope. Those absorbent channels or tubes constitute the stigma. The pappus, which is met with in compound flowers, and which exists completely formed in the ripe seeds, is certainly not to be considered, with Rafn, as a mere inorganic lifeless fibre. To me, it appears to consist of large elongations of the secondary vessels, which contribute a great deal to the condensation and proper preparation of the sap. They, indeed, grow themselves at the very period they perform these functions; when, therefore, the seed has attained its proper size, the vessels of the pappus become plugged up, and it remains dry upon the seed. The stigma, now in its state of puberty, or when fit for impregnation, is covered with a fluid, which Kœlreuter likewise considers as oily, but the nature of which is not yet investigated. The period when the stigma is moist and the anthers burst, is the period of impregnation. This copulation, however, is in plants performed in so very striking a manner, that we cannot contemplate without admiration the wise measures which nature has taken for the accomplishment of her designs.

"Most flowers are hermaphrodite, or such as have both male and female organs of generation; and one would from this circumstance be led to believe, that in such flowers impregnation is readily completed; this however is not the case with all. Mr. Sprengal has made many observations on this point, most of which are highly important. He discovered two principal ways in which seeds are impregnated, to wit, Dichogamy, and Homogamy. He calls it Dichogamy, when in a hermaphrodite flower one organ of generation is first evolved, and when this has lost its generative power, the other organ arrives at perfection. This is again of a twofold kind. Either the male parts are formed perfectly, before the female parts unfold themselves, which he calls Dichogamia *androgyna;* or it is the reverse, the female parts being first formed. This he styles Dichogamia *gynandra*. Homogamy is, when both parts of generation are formed in a hermaphrodite flower, exactly at the same period. Now, in a hermaphrodite flower, when Dichogamy takes place, impregnation cannot naturally happen without intermediate means, by which both organs of generation may be brought near each other. Linneus thought that the wind performed this, but there are few plants where wind could do it, as

most flowers have such a shape as would rather impede than favour the access of the wind. Kœlreuter was the first who observed clearly that many insects serve this purpose; and Mr. Sprengel had leisure and patience enough to examine in the flower the manner in which insects proceed in completing the impregnation of plants. He found that various species of bees, as well as many of the flying insects, are selected by nature for this purpose; and he even observed, that some flowers had their peculiar insects, which alone visited them. His observations on this subject are very numerous. Those insects, it is true, do not visit the flower on purpose to impregnate it, they only seek after the sweet juice which exudes from it in the nectaries. Their hairy body, which nature did not bestow without design, is covered with the pollen, and, whenever they visit another flower of the same species, the pollen is rubbed against the stigma, and impregnation is the consequence. And every insect that is not limited to one sort of flower, but visits many indiscriminately, will, during a whole day, remain with the species on which it first fixed in the morning, and not touch another, provided there be enough of the first species. Those flowers only which secrete a sweet juice, are visited by insects. Several of these flowers have one or more coloured spots, which Mr. Sprengel calls *Maculæ indicantes*, as they always indicate that a plant exudes honey, and, as he believes, attracts them. In flowers, the hairs are always placed so as to prevent the rain from dropping in, and not to allow the insect to enter the flower at that place, on purpose that it may be obliged to make its way across the stamens. The filiform and leaf-like appendages, which we enumerated amongst the parts of flowers, and which defend the honey, serve the same purpose. But it would be too prolix to give a more detailed account of the manner in which insects do this, as any one has access to see and observe it, if in the least acquainted with the structure of flowers. We need only look at the Iris *germanica*, at many flowers of the class Didynamia, at the Symphytum *officinale*, and many other plants, in order to form a clear idea of it. One of the most singular ways of the fecundation of plants through insects, we have in the Aristolochia *clematitis*, which I shall decribe. This flower has a linguiform corol, which at its inferior part is spherical, towards the top it becomes long and tabular, and its margins end in a flat and spear-pointed manner. The pistil is placed in the round cavity of the corol, the germen of which is surrounded by six anthers, which are shorter than the germen itself. The germen has no style, but is provided with a hexagonal stigma, which is very shallow, and on its upper surface has imbibing pores. The anther cannot empty the pollen upon the stigma, as the flower stands always straight upright during the period of flowering. The pollen therefore must necessarily fall to the bottom of the flower without being used, if no insects come near the flower. And indeed if it be tried, and all insects kept from the flower by a thin, but firmly closed piece of gauze, no seeds will be formed. It happens indeed not unfrequently, that as it is a particular insect which impregnates the flowers, when it is wanting or not able to find the flower, this last withers without having a single seed. This insect is the Tipula *pennicornis*. The round bottom of the flower is, in its interior, quite smooth, but the tube is lined with dense hairs, every one of which is turned towards the interior, so as to form a kind of funnel, through which the insect may very easily enter, but as on its return all the hairs oppose it, it cannot come out. Several insects creep in through the aperture, but are obliged to remain in the cavity of the corolla. Uneasy to be confined in so small a space, they creep constantly to and fro, and so deposit the pollen on the stigma. After this is done, the flower sinks; the hair, which obstructed the passage, shrinks and adheres closely to the sides of the flower, by which means the small confined gnats get free, and may now accomplish their farther destination. Who but must admire the wise provision of nature in fecundating this seemingly trifling flower! Other instances of this kind could be mentioned. The dichogamic plants can be no other way fecundated than by insects. Many flowers blossom in succession on one plant, and the restless insect, which flies from one flower to another, carries the pollen to them all. Epilobium *angustifolium* may serve as an instance of male Dichogamy, and Euphorbia *cyparissias* as an instance of female Dichogamy. Homogamic flowers, that is, such flowers as have their male and female organs of generation formed at the same time, are mostly impregnated by themselves. Several, however, are visited by insects, which complete what perhaps was not completed in the usual way, or what rain, wind, or unfavourable weather, interrupted at the proper period. In these flowers, the following arrangement is made: When the stamens are larger than the pistil, the flower stands upright, and the stamens incline themselves over the pistil; or it lies horizontally, and the stamens curve themselves archways toward the style, so as to become of the same length with the pistil. Of the first kind, the Parnassia *palustris* is an instance. In it the stamens, five in number, recline all over the pistil in the following order: First, one of the stamens places itself across the stigma, lets its pollen go, then rises up and resumes its former position. In the mean time the second is already following in the same manner, and as soon as the first rises from the stigma, the other covers it; the third succeeds like the two first, but as soon as it has risen, the two last come both at once. To the second kind belong the Horse Chesnut, (Æsculus *hippocastanum*,) and others. But if in homogamic flowers the stamens are shorter than the pistil, the flower is pendulous, so that the pollen, when falling off, may be enabled to perform its functions. Rarely have such flowers an oblique or horizontal position, and in this case the style turns backwards, to reach the stamens. Some pendulous flowers, however, can be fecundated only by insects, as their stigma is so situated that the pollen does not directly fall upon it; but then these flowers have, as mentioned before, hair or other processes, which oblige the insect to enter them along the stigma; so that, when they return or visit the flower repeatedly, they must rub the pollen against the stigma. Such plants as are of different sexes, and on one stem have both female and male flowers, are mostly impregnated by insects alone. Only those impregnate themselves which have no nectaries, and where the male flowers stand close to the female flowers, as in some species of Gramina, Typha, Coix, Carex, and others. In that case, such flowers have their female flowers situated lower than the male flowers, and their petals are very minutely or very deeply divided, so that the pollen, when falling, can reach them. This is the case, for instance, with the different species of Pinus, and similar trees. Here probably the wind too is of some service. It disperses the pollen in the air, so as often to involve the tree in a kind of cloud. The sulphur rain, as it has been called, which falls sometimes in spring, after thunder storms, proceeds from the pollen of the Pinus *sylvestris*. Such plants as have on one stem male flowers only, on another female flowers alone, are all provided with nectaries, and the male flowers are larger and more obvious than the female, to allow more readily the insects to carry the pollen to the female plant. The Valisneria *spiralis*, a water-plant of Italy, is of different sexes;

in this the male flower parts with the stem, and swims upon the water, that the aquatic animals may the sooner carry its pollen to the female plant. Many foreign plants flower with us, having distinctly-formed hermaphrodite flowers, but notwithstanding bear no seeds. The climate, however, is not always the cause of their barrenness, but the want of insects, which nature destined in their native countries to fecundate their seeds, and which we have not, along with the transplanted, received into our gardens. One experiment will confirm the truth of this observation: The Abroma *augusta* flowered for many years here, in a hot-house, where no insects had access, without ever bearing a single fruit. The gardener tried the experiment to put the pollen, by means of a hair brush, upon the stigma of several flowers, and he got perfectly formed fruit, which again gave him new plants. In many other cases this has been done, which the limits of this work will not permit us to mention. Might it not be advisable for gardeners, who wish to make Cherry-trees or other fruit-trees bear very early in the season, when they often get little or no fruit at all, to place a bee-hive with bees in the hot-house, and at the same time to take care to let these busy insects get as many flowers as possible?—Nature seems to have given a high degree of irritability to some plants, merely to promote generation. Berberis *vulgaris* has very irritable stamens, for if they are bent only a little, they instantly rebound back to the pistil. Dr. Smith found that a small part of them only is possessed of this irritability. Cactus *tuna* has likewise a great deal of irritability in its stamens. If they are touched with a quill, they all incline over the pistil. As soon, therefore, as insects touch these irritable spots in those plants, the irritability exerts itself, and stimulates the parts, and produces generation. Several plants have these kinds of stamens, for instance, the whole family of Asclepias, &c. The elasticity of the stamens also must in some plants produce generation, for instance, in Lopezia, Urtica, Parietaria, Medicago, Kalmia, and others. The style of some flowers seems to possess some degree of irritability, as it follows the stamens with its stigma. The shutting and opening of flowers, called their Vigiliæ, do not belong to this subject, though by the way they may contribute something to promote generation. It would appear that light stimulates these parts, and produces an expansion. For this reason, perhaps, most flowers open in sunshine. Portulaca *oleracea*, and Drosera *rotundifolia*, are very powerfully stimulated, and therefore open about 12 o'clock, mid-day; but this violent stimulus relaxes their fibres so much earlier, and they shut in an hour after. The stimulus of day-light appears to be too powerful for Œnothera *biennis*, and it cannot open till free from the influence of strong light. It remains open during the night, from evening till morning, and if the succeeding day is cool and cloudy, it will not close its flowers at all. The fibre of some flowers seems to act like a hygrometer, in such a manner that the flower opens by means of moisture, and shuts in a dry atmosphere. This is observed in all the species of Carlina. But is it the too powerful stimulus of the light of the sun, which occasions Nymphæa *alba* to close in the evening, and during the night to continue immersed in the water? Light appears also to operate on the separation of the fine fragrant matter of flowers, so that in some, this matter is separated merely by heat and light; in others, by heat alone, and rendered perceptible to our organs of smell. It is requisite for the performance of generation, that the stigma be moist, and the anthers covered with pollen; if there be any medium which prevents both, it cannot take place. Water does not combine with the pollen, and therefore the rain washes it away: most flowers have such a direction, that they cannot easily be affected by rain; but notwithstanding that, we see that a long continuance of rainy weather may frustrate the harvest of corn and fruit. On this account, almost all aquatic plants that are provided with visible blossoms, raise their flowers above the surface of the water, and after the blossoming the unripe fruit sinks down. Only those water plants which belong to the cryptogamous class, and some few, such as Najas, Caulinia, and Ceratophyllum, which have mucilaginous pollen apparently capable of combining with water, evolve their flowers under its surface; it even would seem that the mucilaginous pollen of the Asclepiades, and Orchides, perhaps suffers from water. Kœlreuter examined, in a very laborious manner, how many grains of pollen might be required for a complete impregnation. His chief discoveries on this point are as follow: All the anthers of Hibiscus *syriacus* contained 4863 grains of pollen; no more than 50 or 60 of which were necessary to a complete impregnation. But whenever he took less than 50 grains, the seeds did not all ripen, but those which were formed were perfect. Ten granules were the least he could take in this flower, as less would not suffice for it. The Mirabilis *jalapa* had 293 globules of pollen in one flower; Mirabilis *longiflora*, 321; and in each of the two plants, only 2 or 3 globules were sufficient for impregnation. The seeds did not appear more perfect, though many more grains were put upon the stigma. To ascertain whether, in flowers with several styles, each must be impregnated separately, Kœlreuter in several of them cut all off but one, and the fecundation was as perfect as could be expected with all the styles. Even in flowers, in which the style was entirely separated, fecundation took place through one of them. This experiment shews, that the tubes of one style communicate with all the rest, and that more styles and more pollen are formed, merely to ensure their determination. From this circumstance philosophers have concluded, that the cellular texture of all germens fixed in the receptacle, must have some general connection.

"The great and wonderful process of generation has led various philosophers to form very peculiar hypotheses, which each has tried to establish by a number of arguments. To give an accurate account of all of them, would be transgressing the bounds of our present researches; it will suffice to mention only the most important. The first natural philosophers thought, that an accidental mixture of solid and liquid parts was sufficient to form, according to circumstances, animals or plants. This was called *Generatio æquivoca*. Others imagined, that the small animals which were observed in the semen, (*animalcula spermatica*,) go into the ovaries of the mother, and thus form the future being. Others again, believed that in the mother a rudiment of the future animal pre-existed, to which the semen of the male imparted life. However, this theory was called the system of pre-formation, or the *Systema præformationis, prædelineationis*, or the theory of evolution. These three appellations properly denoted three different ideas; but in reality they all concur in this one point, that all three suppose a pre-existence of the future being in the mother. Lastly, philosophers alleged, that the fecundating fluids both of female and male become mixed together, and thus give existence to the future animal. This theory was styled, *Epigenesis*. The *generatio æquivoca*, was supposed in former times chiefly to take place in insects, worms, and plants; but it is now entirely abandoned by all rational men. Harvey's doctrine is now well known, *omne vivo ex ovo*; farther observations of philosophers daily confirm this truth, by new important observations. I would indeed no longer notice this old theory, did not some botanists explain the

formation of Fungi, merely by the fermentation of putrefying vegetable matter: their sudden rise, and the places which some of them always occupy, led them to form this idea. Though Patrin, and some later philosophers, suppose, that the last members of the organized body may, like the species of Boletus, and the intestinal worms, have their origin from generatio *æquivoca;* I must confess that their hypothesis, notwithstanding its ingenuity, never appeared to me sufficiently plain. The theory of animalcula in the semen of animals being carried over to the ovarium of the mother, where the new animal is formed, has Leuwenhoeck for its author. Some in the vegetable kingdom, assumed pre-existing germs or corcles in the pollen, which in the mother's ovaries formed the future plant. The most zealous supporter of this opinion was Mr. Gleichen. Some even went so far as to see, under the microscope, small asses in the semen of an ass, and small lime-trees in the pollen of a lime. Strange things may be seen, if persons are disposed to see them. Kœlreuter's observations at once overthrow this doctrine. The system of pre-formation, which in former times was generally admitted, is now, even by its most zealous admirers, much doubted in the vegetable kingdom. Spallanzani, who in animals, by means of tedious experiments, attempted to prove the pre-existence of the animal before the impregnation of the ovum in the ovaries, freely confesses, that there is no pre-existence of plants like that in animals. The *Epigenesis*, or generation by a commixture of the fluids given out both by male and female, is what most physiologists now assume as the only true theory of generation both in the animal and vegetable kingdoms. Kœlreuter confirmed it by numerous experiments, of which we shall mention one only: He planted the Nicotiana *rustica* and *paniculata*. The first he deprived of all its stamens, and fecundated its pistil with pollen of the last species. Nicotiana *rustica* has egg-shaped leaves, and a short greenish yellow corol; Nicotiana *paniculata*, a stem half as long again as the former, and roundish cordate leaves, and much longer yellowish green corols. The bastard offspring of both, kept in all its parts the middle betwixt the two species. He tried the same with more plants, and the result accorded perfectly with the first. Were we therefore to admit the *animalcula seminalia*, the hybrids could necessarily not have differed in their form from the male plant; and, on the other hand, were the system of evolution founded in nature, they would have the same form as the female plant. The hybrid, however, was intermediate between both; it therefore certainly adopted some parts both from father and mother, and was formed by Epigenesis. Kœlreuter could only obtain hybrids by intermixing similar plants. Dissimilar plants never produced them, even though, according to our system, they belonged to one genus. It appears by this, that nature seeks to avoid unnatural mixtures. The instance of mules not generating, as it was once believed at least, induced many philosophers to make it an axiom, that hybrids are barren. But we now know a good many instances in zoology of hybrids being very productive; and even the instance of mules does not prove any thing, as in warm climates they are sometimes prolific. Kœlreuter likewise found hybrids of various species of tobacco, and some more plants, to be sterile, the pistil in them being perfect, but the stamens not completely formed. But there are now several instances of hybrid plants which retain their original form, and propagate themselves. I shall mention a few, with their parents. Sorbus *hybrida:* the mother was Sorbus *aucuparia;* the father, Cratægus *aria*. Rhamnus *hybridus:* the mother was Rhamnus *alpinus;* the father, Rhamnus *alaternus*. What mixtures do not the species of Pelargonium produce in our gardens? All plants of the 21st, 22d, and 23d classes of Linneus, mostly generate prolific hybrids. Linneus wrote a particular treatise on hybrids, in which he attempted to explain the origin of some particular plants; but unfortunately he has given nothing but conjectures, for none of his observations accord with experience. Should it not, from the observations made with regard to the hybrids of the animal and vegetable would, be laid down as a rule, with some exceptions, that all hybrids are productive, but that some only want a warm climate to unfold the male semen? I do not attempt to establish this rule as a certain truth; I rather wish, that philosophers would consider this subject more accurately, and attend more to the hybrids of different climates, in order to discover the truth. But Kœlreuter made some experiments, which afford the clearest proof of the doctrine of *Epigenesis*, and the fructification of plants. I shall only mention one of his observations as an instance. He obtained a hybrid from Nicotiana *rustica* and *paniculata*. Nicotiana *rustica* was the female plant, *paniculata* the male. The hybrid, like all the others which he brought up, had imperfect stamens, and kept the medium between the two species. He afterwards impregnated this hybrid with Nicotiana *paniculata*, and got plants which much more resembled the last. This he continued through several generations, till in this way, by due perseverance, he actually changed the Nicotiana *rustica* into the Nicotiana *paniculata*. By these and other experiments, often repeated, and made in various ways and upon other plants, it is quite obvious, that there is no pre-formation in plants. According to the theory of Epigenesis then, the fluids of the male and female are mixed, and an offspring is obtained from these two, which in form and properties resembles both father and mother. It were to be wished that all theories could be proved in as convincing a manner, as generation can be demonstrated by the number of discoveries on this head, made in the animal and vegetable kingdom.

"But there have been philosophers, both in former and modern times, who in plants have altogether denied the existence of sexes. Smellie seems to favour this opinion, as he repeated an experiment of Spallanzani's, with a female plant of hemp, which he kept remote from all male plants, and notwithstanding obtained, though in a small quantity, perfect seeds, and hence he deduces his argument. But such experiments are too difficult to be free from error; and who can positively assert, that he has not, even with the greatest attention, been deceived? Spallanzani placed his female plant in a room, to which no insects could get, and, for the greater security, likewise covered it. But could he, before the first flower appeared, distinctly enough distinguish the female plant of the hemp? And could not a very small minute insect escape his eyes, and effect a fecundation? Besides, how often do we find on hermaphrodite plants a single stamen; which perhaps was here the case? The few seeds which he got, prove, that a few single parts were necessarily fecundated. But even supposing that in hemp the female plant produces ripe seeds without fecundation, can we apply any conclusion, however just from this single plant, to every other vegetable. We have in the animal kingdom an instance in the Aphis, an insect which, without the aid of a male, propagates itself till autumn. But who would, from this isolated observation, founded as it is in truth, attempt to deny in all animals the existence of a difference of sex? Since Gleditsch first, in a botanic garden, impregnated the Chamærops *humilis*, which is a female plant, with pollen of the male plant, which Kœlreuter sent to him from Karlsruhe, and obtained ripe seeds and young plants, which before never had been possible, thousands of similar experiments have been made, which pu

it beyond doubt that two sexes exist in plants. Every person may, indeed, easily convince himself of the fact, by repeating such experiments on the species of Melon and Gourd; and every where in the vegetable kingdom he will find two distinct sexes. The seed already exists in the germen during the time of blooming, before fecundation takes place, and contains a very clear liquor, called, by Malpighi, the Chorion. With this, most likely, the fecundating particle of the male semen is mixed, and thus produces the embrio of the future plant. Kœlreuter, however, thinks that the moisture of the stigma, which he, according to his favourate idea of an oily impregnating fluid in vegetables, supposes likewise to be oily, is mixed with the fluid of the male, and that these two combined are conveyed into the seed. However, be this as it will, great alteration is observed to take place in the seed sooner or later after fecundation, according to the variety of plants. For in the neighbourhood of the navel a small vesicle appears, filled with some liquid. The vesicle is called the *sacculus colliquamenti;* and the liquor in it, the *amnios*. This vesicle grows larger, absorbs the chorion, which at last entirely disappears, so that the cuticle finally becomes the *membrana interna* of the seed. The *amnios* grows hard, and forms the cotyledons. As soon as the vesicle shews itself, the embryo of the future plant likewise appears gradually, which consists in the corcle. It is formed gradually, and becomes visible in the Sun-flower, (Helianthus *annuus*,) three days after impregnation; in the Cucumber, (Cucumis *sativus*,) a week after; and in Meadow Saffron, (Colchicum *autumnale*,) some months after. It is flaky in the beginning, but in time becomes, like the vesicle which contains it, larger and firmer. The vesicle does not in all seeds increase in the same form; in some it grows larger in its whole circumference, in others it grows longer towards one extremity, which runs straight out to the opposite end, and the sides are extended. Thus the seed comes to maturity, and when perfectly ripe, separates in different ways from its mother plant, and begins a new life itself, passing through all the scenes again, just now explained. This is the common way in which plants are propagated. But we have plants, which do it in another way besides evolving their seeds. At the stem, or near the angles of the leaves, by nature, or even through accident, the spiral vessels of plants form sometimes knots, which become buds, and separating spontaneously from the plant itself, send out roots and leaves, thus forming an entirely new plant of the same species. Such plants are called viviparous plants, (*vegitabilia vivipara*.) Several species of Garlic, (*Allium*,) the Lilium *bulbiferum*, Poa *bulbosa*, and other plants, do this spontaneously. The garden Tulip, (Tulipa *gesneriana*,) exhibits this curious phenomenon by means of a simple manœuvre of art, if the flower is cut off before impregnation has taken place, and the stem with the leaves be allowed to remain, provided it be in a shaded spot. Several succulent plants, for instance, Eucomis *punctata*, do it when treated in the above manner. Gardeners increase plants by layers, suckers, grafts, and inoculation, in a similar manner. The bud of a tree or shrub, when grafted into another stock, will there be unfolded, and must indeed be regarded as a different plant altogether. It is not changed in its nature, but grows as if placed in the earth; the stem only serves to convey the imbibed sap to it, which it must itself digest according to its nature. Agricola and Barnes, it appears, were more successful in these operations, for they placed buds directly in earth, and produced perfect plants. It is remarkable in this kind of artificial increase, that where branches or buds are in any way formed into new plants, by layers, grafts, or inoculation, the plant from which they were taken does not propagate as species, but only as *variety*. If we take the part of an individual, and convert it into a particular plant, in this way all the varieties may be multiplied. The seed therefore propagates only the species which may grow from it under many different appearances as varieties: but in the branch, as in the bud, the germ is already formed, and it is totally impossible that the shoot issuing from them can alter in the least. Thus is the Apple of Borstdorf propagated by grafts: inoculation will always remain the same, but from the seed will be obtained many varieties entirely different.

"The stem of ligneous plants, annually adds a new ring of vessels. The first circles begin to become ligneous on their sides. The wood has, in general, when young, a yellowish white colour, which, according to the species of the plants, assumes a darker hue every year. The quick circulation of the sap takes place only in the young vascular circles; in the older ones the sap is carried along much slower, and they have their irritability greatly diminished. The life of every shrub or tree consists only in the young rings of these vessels, which is called inner bark, and the plant must die when this is wounded. Thus, if a ligneous plant has performed its offices for a number of years, then the innermost ring begins to be obstructed, and to become more and more dense; this occasions that those lying next them no longer obtain their moisture from them. They therefore begin to move their sap slower, and the youngest vascular circle becomes gradually thinner and thinner. At last the sap stops likewise in the following ligneous ring; the young vascular circle cannot form itself completely; few buds are now unfolded; the small number of leaves cannot prepare sufficient sap for the whole; and the common certain lot of organized bodies, death, sets the final insurmountable bound to vegetation. In herbaceous plants all the vessels of the stem become dry and hard in one year; and as they can no longer convey the sap, consequently the stem decays at the end of the year. Their root forms, as the stem of ligneous plants does, annually a new vascular circle, and it dies in the same manner, when all those circles have become too ligneous. But such herbs, the roots of which are annually renewed, are of constant duration. The old root dies, its fibres being entirely ligneous; but a new one appears, and is to be considered as a young plant. Herbs, whether they live one year only, as the annual plants, or two years, as biennial plants, become so exhausted by the formation of the flower and fruit, that the irritability of their vessels becomes much impaired; they therefore become quite ligneous, and the root and stem must decay after their fruits are ripened. They may, however, be preserved for several years, if their flowers, when in the bud, be taken off. The same happens when their flowers are filled, in which case fecundation does not take place, and consequently no fruit is formed. These vessels retain that irritability which is necessary for their duration, and which would have been lost by the wasting of their strength, and their fibres become ligneous more slowly. Natural death is not the same in all vegetables: as in all organized bodies, it ensues in three ways. First, by the induration of the fibre; as in trees, shrubs, and under-shrubs. Secondly, by the powers being exhausted; as in annual and biennial plants. Lastly, by dissolution; as in soft Fungi, and the species of Boletus. These plants imbibe a great quantity of moisture, which increases with their age. In them no part becomes ligneous; but they die in too softened a state, and putrefy from a superfluity of moisture. The duration of life differs greatly in different plants. Some species of Boletus require only a few hours for their evolution, and as soon again decay. Several Fungi live only a few days, others weeks and months. Annual

plants live three, four, or at the utmost eight months. Biennial plants continue sixteen, eighteen, and even twenty-four months. Many herbaceous plants grow a few years, but several a long series of years. There are some shrubs and trees which can live eight, ten, a hundred, even a thousand years. With us the Oak and Lime-tree attain to the greatest age. The former may live six or eight centuries, and above; and stems, almost as old, have been seen of the latter. But the trees which in our globe arrive at the greatest age, are beyond doubt the Adansonia *digitata*, the Pinus *cedrus*, and the different species of Palm. The Adansonia probably lives longest of all, as its age is computed to be one, if not many, thousand years.

Phyteuma; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, acute, from erect spreading, superior. *Corolla:* one-petalled, wheel-shaped, spreading, five-parted; segments linear, acute, recurved. *Stamina:* filamenta five, shorter than the corolla; antheræ oblong. *Pistil:* germen inferior, roundish; style filiform, the length of the corolla, recurved; stigma bifid, or trifid, oblong, revolute. *Pericarp:* capsule roundish, two-celled or three-celled, opening on both sides by a lateral hole. *Seeds:* very many, small, roundish. Essential Character. *Corolla:* wheel-shaped, with linear segments, five-parted. *Stigma:* bifid or trifid. *Capsule:* roundish, two-celled or three-celled, inferior.—All the European species of this genus are hardy plants, which will thrive in the open air. They are propagated by seeds, which should be sown in autumn, for, if they are kept out of the ground till the spring, they frequently fail, or at least lie a year in the ground. The seeds should be sown on a bed of fresh undunged earth, where they are designed to remain, for they do not thrive so well when they are transplanted; therefore the best method is to make small drills across the bed about eighteen inches asunder, and sow the seeds therein; then cover them lightly over with earth, for if they be buried too deep they will rot in the ground. In the following spring the plants will come up, when they should be diligently weeded, which is all the care they require; only they should be thinned where they are too close, so as to leave them six or seven inches apart in the rows; and afterwards they require no farther attention, except weeding. In June they will flower, and in favourable summers ripen their seeds. As they do not continue above two or three years, there should be seeds sown every other year to continue the sorts. They are plants which require little trouble to cultivate them, and their flowers make a pretty variety in large gardens, therefore they may be allowed a place amongst other hardy flowers.

——The species are.

1. Phyteuma Pauciflora. Head somewhat leafy; bractes ovate, ciliate; all the leaves linear-lanceolate, subcrenate. This is a very small perennial plant; head single, thin, having not more than twenty large blue flowers; teeth of the calix the length of the germen.—Native of the south of Europe.

2. Phyteuma Scheuchzeri. Head somewhat leafy; bractes linear, longer than the head; leaves lanceolate, toothed; root-leaves sometimes elliptic and blunt, or obsoletely cordate.—Native of the Swiss and Piedmontese mountains.

3. Phyteuma Michelii. Head roundish; bractes oblong-lanceolate; leaves linear, rigid, almost entire.—Native of the mountains of the Valais and Tuscany.

4. Phyteuma Hemisphærica; *Grass-leaved Rampion.* Head roundish; bractes ovate; leaves linear, almost quite entire, scarcely shorter than the stem. It resembles the preceding, but differs in having the leaves longer, flaccid, and more lanceolate.—Native of the south of Europe.

5. Phyteuma Comosa; *Glaucous Rampion.* Flowers in a sessile terminating bundle; leaves toothed; root-leaves cordate; root biennial, or perennial. It varies with all the leaves spatulate and blunt.—This is a beautiful plant, remarkable for its glaucous herbage, and purple inflated flowers. Native of Monte Baldo, and the Tyrolese and Carniolian mountains.

6. Phyteuma Orbicularis; *Round-headed Horned Rampion.* Head roundish; leaves serrate; root-leaves cordate. The long woody root branches near the surface into several divisions, each bearing a dense tuft of petioled, smooth, veiny, serrate, or rather crenate, leaves; the stem is about a foot high, crowned with a dense head of dark blue flowers. Every part of the flower remains permanent, though faded, till the seeds are dispersed, or longer. The herb is milky, but not acrid.—Native of the south of Europe; and of England, on chalk downs, as about Leatherhead; on Epsom downs; on the South Downs; near Maple Durham, in Hampshire; near Sutton and Dorking; on Beacon-hill near Feversham in Kent; also between Kingsbury and Harrow; and between Harrow and Pinner in Middlesex; and between Selbury Hill and Beacon Hill in the way to Bath. It flowers in July and August.

7. Phyteuma Nigra. Head ovate; bractes bristle-shaped; leaves simply toothed; root-leaves cordate; stem-leaves lanceolate, embracing.—This plant is a native of Bohemia, and is quite singular, in the dark violet-colour of the flower, the bristle-shaped bractes, and the shape of the leaves.

8. Phyteuma Betonicæfolia. Spike oblong; leaves simply crenate; root-leaves lanceolate, cordate; stem-leaves lanceolate.—Native of Dauphiny.

9. Phyteuma Spicata; *Spiked Horned Rampion.* Spike oblong elongated; styles somewhat hairy, trifid; root-leaves cordate, doubly toothed; root yellow on the outside, white within, having some ovate little tubers hanging to it at bottom; flowers sessile; corolla blue. The whole plant abounds with a milky juice. The root is eaten boiled; and bees are fond of the flowers.—Native of Germany, Switzerland, Austria, France, and Italy.

10. Phyteuma Ovata. Spike ovate; styles hirsute, longer than the flower, emarginate, bifid; root-leaves cordate, doubly toothed. Stem from eighteen inches to two feet in height, not branched; flower deep violet.—Native of Bohemia, Switzerland, and Piedmont.

11. Phyteuma Lobelioides. Leaves linear-lanceolate, toothletted, hispid; stem panicled; flowers germinate, peduncled, scattered. It resembles the preceding very much; flowers narrower.—Native of Armenia.

12. Phyteuma Lanceolata. Leaves linear-lanceolate, very finely toothletted, rugged; stem branched at the base; branches very simple, leafy; flowers scattered, germinate, sessile.—Native of Armenia.

13. Phyteuma Rigida. Leaves linear-lanceolate, obscurely toothletted, smoothish; stem quite simple, leafy; flowers scattered; peduncles three-flowered. It resembles the preceding very much.—Native of the Levant.

14. Phyteuma Amplexicaulis; *Toothed Rampion.* Leaves embracing, cordate-ovate, doubly serrate; flowers scattered. Stem round, smooth, simple, leafy; flowers on the upper part of the stem, distant, peduncled, large, bright blue.—Native of the Levant.

15. Phyteuma Pinnata; *Winged-leaved Rampion.* Leaves pinnate; flowers in cymes. Stem somewhat branched, smooth, grooved; flowers the largest of any of the species, in many-flowered, scattered, alternate cymes, disposed on the upper naked part of the stem.—Native of Candia or Crete.

Phytolacca; a genus of the class Decandria, order Decagynia.—Generic Character. *Calix:* none, unless the corolla be called a coloured calix. *Corolla:* petals five, roundish, concave, spreading, bent in at top, permanent. *Stamina:* filamenta ten, or eight, or twenty, awl-shaped, the length of the corolla; antheræ roundish, lateral. *Pistil:* germen orbiculate, depressed, divided externally by swellings, ending in eight or ten very short spreading reflex styles; stigmas simple, permanent. *Pericarp:* berry orbiculate, depressed, marked with ten longitudinal grooves, umbilicated with the pistils, and having as many cells. *Seeds:* solitary, kidney-form, smooth. *Observe.* The sixth species has the sexes distinct. Essential Character. *Calix:* none. *Petals:* five, calicine. *Berry:* superior, five or ten celled, and as many seeds.——The species are,

1. Phytolacca Heptandra. Flowers seven-stamined, six-styled; leaves lanceolate. Root perennial; stem two feet high, branched, upright, striated, smooth, hollow. It is much smaller and tenderer than the other sorts; corolla white, green underneath, spreading.—Native of America.

2. Phytolacca Octandra; *White-flowered Phytolacca.* Flowers eight-stamined, eight-styled. This has the stature of the next species, but the leaves are whiter. Root perennial, long, and fleshy. The common peduncle is very short, and there are scarcely any pedicels; calix and corolla white, quite flat, and not concave; berries black, the size of a large pea. The whole plant has a rank habit, and smells unpleasantly when bruised. It flowers from July to November. —Native of Mexico.

3. Phytolacca Decandra; *Branching Phytolacca*, or *Virginian Poke.* Flowers ten-stamined, ten-styled. Root very thick and fleshy, as large as a man's leg, divided into several thick fleshy branches, which run deep in the ground; stems three or four, herbaceous, as large as a good walking-stick, of a purple colour, six or seven feet high, dividing into many branches at the top. The peduncles come out from the joints and divisions of the branches, and are about five inches long; the lower part is naked, but the upper half sustains a number of greenish-white flowers, and dark purple berries, ranged on each side like common currants. It flowers in July and August, and in warm seasons the berries ripen in autumn.—Native of Switzerland, Spain, Portugal, Barbary near Algiers, Virginia, Georgia, New England, and Jamaica. Parkinson says, that the inhabitants of North America use the juice of the root as a familiar purge. An ounce of the dried root, infused in a pint of wine, and given to the quantity of two spoonfuls, operates kindly as an emetic, and is preferable to most others, as it hardly alters the taste of the wine. The roots are applied to the hands and feet in ardent fevers. Farriers give a decoction of them to drench cattle; and apply them in the form of poultice for discussing tumors. Poultry are fond of the berries; but if eaten in large quantities, they give the flesh a disagreable flavour. The juice stains paper and linen of a beautiful purple colour, but it will not last long; though, if a method of fixing the dye could be discovered, it might be very useful. The vintners in Portugal for many years used the juice of these berries to give a deep colour to the Red Port Wines, to which it was thought to communicate a disagreable taste when mixed in too great a quantity. Complaint of this practice having been made to government, orders were given that the stems of this plant should be cut down and destroyed before they produced berries. In North America and the West Indies the young shoots are boiled and eaten like Spinach.—Sow the seeds in the spring, upon a bed of light earth; and when the plants come up, transplant them into the borders of the flower-garden, allowing them space to grow, for they will overbear other plants if they are too near them, especially if the soil be good. Clear them from weeds, and in the autumn they will produce flowers and fruits. The first frost will destroy the stems; but the roots will abide, and shoot in the spring. In very severe winters the roots will be destroyed, especially in a wet soil, unless the surface be covered with mulch.

4. Phytolacca Icosandra; *Red Phytolacca.* Flowers twenty-stamined, ten-styled. It rises with an herbaceous stalk from two to three feet high, with several longitudinal furrows, and changes at the end of summer to purple. The flowers are large, white within, of an herbaceous colour on the edges, and purplish on the outside, on short pedicels. The berries are of a dark purple, very succulent, and their juice stains paper and linen of a beautiful purple colour, which would be very valuable if made permanent. Native of the East Indies.—This, and the second species, being less hardy, the seeds should be sown upon a moderate hot-bed in the spring. When the plants are fit to remove, transplant them into another hot-bed, shading them till they have taken new root. Then treat them as other tender exotic plants; and at the beginning of July set them out upon a warm border, or in pots filled with light rich earth, and shaded till they have taken new root: water them duly in dry weather, and keep them clean from weeds. They perfect their seeds every autumn, and may therefore be easily preserved.

5. Phytolacca Dodecandra; *African Phytolacca.* Flowers fifteen-stamined, five to eight styled. This shrub is a fathom in height; stem upright, rude, tubercled, ash-coloured; flowers scattered, on short pedicels, herbaceous, three lines wide; berry roundish, flattened, many-angled, but commonly five-angled, five-celled, marked at top with lines from the styles, then growing to the berry, fleshy, soft, red, with a saffron-coloured juice, four lines in diameter. It is distinguished from the second and third species by its shrubby stalks and decandrous flowers. It flowers in May and June. —Native of Abyssinia.

6. Phytolacca Dioica; *Tree Phytolacca.* Flowers diœcous, with many stamens. Stem upright, a little branched, very thick, gray; leaves scattered, oblong-ovate, acuminate, entire, smooth, flat, or ascending on the sides, five inches long and two inches and a half wide; clusters drooping, somewhat downy; flowers greenish-white, the female ones smallest; berries large, crowded, pale, much depressed and umbilicated. Native of South America.—Plant cuttings, during the summer months, in pots filled with light earth, and plunged into a moderate hot-bed, covering the pots with hand-glasses, and shading them. In five or six weeks they will put out roots; then plant each in a small pot, plunge them into the bed again, shade them till they have taken root, and then gradually inure them to the open air, where they may remain till the end of September, when they must be removed into a moderate stove for the winter season.

Picramnia; a genus of the class Diœcia, order Pentandria; or, according to Swartz, of the class Triandria, order Digynia.—Generic Character. *Male. Calix:* perianth one-leafed, three or five parted; segments lanceolate, erect. *Corolla:* petals three or five, lanceolate, from erect spreading, longer than the calix. *Stamina:* filamenta three or five, awl-shaped, approximating at the base, erect, longer than the corolla; antheræ ovate, twin. *Female*, on a different plant. *Calix:* as in the male, permanent. *Corolla:* as in the male. *Pistil:* germen oblong, somewhat compressed; styles two, short, recurved, permanent; stigmas simple, acute. *Pericarp:* berry ovate-roundish, two-celled. *Seeds:* two in each cell, ovate-oblong. *Observe.* Swartz

describes three stamina, a three-parted calix, and a three-petalled corolla. In the specimens sent to Schrœber by Crudy there are five stamina and five-cleft flowers. The berry sometimes, but very seldom, is three-celled and one-seeded. ESSENTIAL CHARACTER. *Calix:* three or five parted. *Corolla:* three or five petalled. *Berry:* two-celled. ——The species are,

1. Picramnia Antidesma. Racemes very long; flowers three-stamined. This is a small tree, with an upright, weak, even trunk; branches subdivided, rod-like, spreading, bending down, smoothish, with an ash-coloured bark; berries oblong, the size of a gooseberry when ripe, two-celled; cells two-seeded, at first scarlet, afterwards black.—Native of mountain coppices in Jamaica and Hispaniola. Dr. Browne says it is pretty frequent about St. Mary's in Jamaica, and seldom rises above eight or nine feet from the ground; it was not put to any use there. Swartz relates, that it is looked upon as antivenereal by the negroes, who with more reason employ an infusion of it in the colic. The whole plant is very bitter, and is called *Major Bitters* in Jamaica. It flowers in August, and the fruit is ripe in November.

2. Picramnia Pentandra. Racemes shorter; flowers five-stamined. This is a small tree, with the branches, branchlets, and leaves, as in the preceding; but the leaflets are commonly wider.—Native of the West Indies.

Picris; a genus of the class Syngenesia, order Polygamia Æqualis.—GENERIC CHARACTER. *Calix:* common double; outer very large, five-leaved; leaflets cordate, flat, loose, converging; inner imbricate, ovate. *Corolla:* compound, imbricate, uniform, with numerous hermaphrodite corollets; proper one-petalled, ligulate, linear, truncate, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* germen subovate; style the length of the stamina; stigmas two, reflex. *Pericarp:* none; calix unchanged, at length reflex. *Seeds:* solitary, ventricose, transversely grooved, blunt. *Down:* feathered, stipitate. *Receptacle:* naked. ESSENTIAL CHARACTER. *Calix:* double; the inner equal, the outer lax. *Receptacle:* naked. *Seed:* transversely grooved. *Down:* feathered.—— The species are,

1. Picris Echioides; *Rough Ox-tongue.* Outer perianths five-leaved, larger than the inner one, which is awned. Root annual, branched; stem two or three feet high, round, firm, striated, usually reddish, much branched; both stem and branches irregularly set with scattered rigid spines, hooked at the end; lower leaves lanceolate, upper heart-shaped, and clasping the stem; flowers solitary, on grooved peduncles, gradually thickening upwards; corolla yellow. The flower expands at four or five in the morning, and never closes before noon; sometimes it remains open till nine at night. The only use to which this singular plant has been applied is as a potherb; but it can only be eaten when young, and then it is said to be agreeable: the juice is milky, bitter, but not too acrid.—It flowers in June and July; and grows not unfrequently on banks, on the edges of corn-fields, and in woods that have been cut down, in England, France, and Italy.

2. Picris Aculeata; *Prickly Ox-tongue.* Hispid, rough: stem naked at top; leaves obovate-oblong, unequally toothed; flowers corymbed; peduncles thickened at top; down feathered, stiped. It differs from the preceding in having no outer five-leaved perianth. Perennial.—Native of Barbary, on the uncultivated hills.

3. Picris Hieracioides; *Hawkweed Ox-tongue.* Perianths loose; leaves entire; peduncles scaly up to the calix. Stem three feet high, round, furrowed, rough, with stiff hairs, much branched; the branches furrowed, purple on their upper side, and in their axils; flowers yellow.—Native of many parts of Europe: with us it occurs abundantly about the borders of fields, in a gravelly or calcareous soil; flowering in July and August.

4. Picris Flexuosa. Perianths hispid; leaves toothed, cordate, embracing. Stem grooved, hispid; flower on the branches terminating, solitary. Native of Japan.

5. Picris Asplenioides. Stem prostrate at the base; leaves rough, the lower runcinate; lobes rounded; calices imbricate; leaflets reflex at the tip; root perennial, fusiform, the thickness of a man's little finger; corollets sulphur-coloured above, rose-violet underneath. Perennial.—Found on the sandy coasts of Tunis.

6. Picris Repens. Outer perianths imbricate, short; inner cylindric, eight-leaved, even. Stem creeping; flowers few, yellow, on long scattered peduncles, almost equal to the leaves; root slender, very bitter.—Native of China, near Canton.

Picrium; a genus of the class Tetrandria, order Monogynia. —GENERIC CHARACTER.. *Calix:* perianth one-leafed, four or five cleft, permanent; segments linear, acute, erect. *Corolla:* one-petalled, funnel-form; tube the length of the calix; border four or five cleft; segments ovate, acute; nectary scales four or five, at the base of each filamentum, between that and the tube of the corolla. *Stamina:* filamenta four or five, filiform, almost the length of the corolla, inserted into the tube; antheræ sagittate. *Pistil:* germen oblong; style filiform, longer than the corolla; stigma capitate, bilamellate. *Pericarp:* capsule ovate, half two-celled, two-valved. *Seeds:* very many, minute, fastened to the receptacle. ESSENTIAL CHARACTER. *Calix:* four or five cleft. *Corolla:* one-petalled, four or five cleft. *Nectary:* of four or five scales. *Stigma:* bilamellate. *Capsule:* half two-celled, two-valved.——The species are,

1. Picrium Spicatum. With ovate-oblong sharp leaves, and white flowers. This is an annual plant of about three feet high. The root is fibrous, branched, and somewhat woody; the stem round and straight; flowers spiked, axillary, and terminal; corolla white, not deciduous. The whole plant is bitter: it flowers at various times of the year.—It is found near the banks of rivulets and pathways in Cayenne and Guiana.

2. Picrium Ramosum. With narrow sharp-pointed leaves and purple flowers. This species differs from the former in having a branched stem, and smaller and narrower leaves.—It flowers at all times of the year; and is found in woods and by rivulets in Guiana.

Pigeon Pea. See *Cytisus Cajan.*

Pig-nut. See *Bunium.*

Pilcorn, or *Pillis.* See *Avena Nuda.*

Pilewort. Ree *Ranunculus.*

Pilocarpos; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth inferior, very small, five-leaved; leaflets ovate, rounded. *Corolla:* five-petalled; petals flat, small, ovate. *Stamina:* filamenta five, inserted under the germen, erect, a little shorter than the petals; antheræ small, subcordate, erect. *Pistil:* germen superior, flatted-globular, smooth, having five lines engraved on it at top towards the style; style scarcely any; stigma subsessile, acute. *Pericarp:* capsule composed of five grains, two or three, and sometimes four, of which are abortive, fastened from the base to the middle to an angular, woody, short receptacle, distinct above. *Seeds:* solitary, arilled. *Observe.* It is very nearly allied to *Euonymus.* ESSENTIAL CHARACTER. *Calix:* five-leaved. *Corolla:* five-petalled; filamenta inserted below the germen. *Peri-*

carp: with from two to five coccuii or grains, united below, elastic.——The only known species is,

1. Pilocarpus Racemosus. A low shrub, with round, smooth, pendulous branches, covered with ash-coloured bark, and alternate, short, purplish brown branchlets; clusters terminal, solitary, many-flowered, a foot or more in length; flowers bright purple.—Native of the West Indies.

Pilularia; a genus of the class Cryptogamia, order Miscellaneæ.—Generic Character. *Common Receptacle:* globose, with four cells and four valves, lined with numerous antheræ, and many globose germina beneath them.——The only known species is,

1. Pilularia Globulifera; *Pillwort,* or *Pepper Grass.* Stem perfectly prostrate and trailing, throwing out numerous roots at every joint, by which it creeps to a considerable extent; and also about three delicate slender leaves, two or three inches in length, simple, upright, awl-shaped, smooth; fructifications globular, like pepper-corns, downy, solitary, sessile, or on very short pedicels at the base or axil of the leaves. What at first sight seems a capsule, is in fact a hollow receptacle, as in the Fig, which separates into four valves, and is internally divided into as many cells; the valves are lined with organs of fructification, several sessile club-shaped antheræ being in the upper part, and about as many oblong germina occupying the lower. Jussieu says the antheræ are most numerous; and also remarks that the seeds are coated. Mr. Sowerby found the germina shaped like an acorn reversed, and terminating in a small acute style. From this it appears that the *Pilularia* has almost as good a claim to a place among perfect flowers as the Fig, and might perhaps be ranged in the order Polyandria, of the class Monœcia. In habit and sensible qualities it has most affinity with the *Equisetum, Lycopodium,* and other plants of obscure fructification, which are akin to the proper Ferns. The fructification is produced from May to the end of autumn. —It is found in shallow ponds and watery places, on gravelly or sandy commons or heaths: as, on Hillingdown common, and Hounslow heath, in Middlesex; near Yarmouth in Norfolk; St. Faith's Newton near Norwich; on Hainford and Stratton heaths in the same county; in the ponds on the upper part of Streatham in Surry; and about two miles from Mold, near Affa's dyke, in Flintshire, on the north side of the Chester road.

Pimelea; a genus of the class Diandria, order Monogynia. For its Generic Character, see *Passerina.* Essential Character. *Calix:* none. *Corolla:* four-cleft. *Stamina:* inserted into the throat. *Nut:* covered with a bark, one-celled. *Observe.* These plants are united to the genus *Passerina* by the younger Linneus, because he was not willing to break a natural genus, on account of a diversity in the number of stamina. He remarks that the flowers have the odour of *Syringa,* and that the plants are evergreen. ——The species are,

1. Pimelea Linifolia. Leaves linear-lanceolate; heads terminating, involucred; corolla villose on the outside. It has a small zigzag root, from which rises a straight, round, smooth, upright stem, generally branched in an irregular manner, though sometimes appearing dichotomous, in consequence of the young branches springing in pairs from the upper part of the old-flowering ones. The bark is reddish, cracking longitudinally, and its inner layer is remarkably silky; flowers in terminal heads, numerous, inodorous. In England it is a green-house shrub, bearing, from February to August, numerous elegant white flowers.—Native of the rocks on the coast of New South Wales.

2. Pimelea Gnidia. Leaves oblong-lanceolate, acute, very smooth; corolla villose on the outside.—This is a native of New Zealand, in the fissures of rocks, both on the coast and on the tops of mountains.

3. Pimelea Pilosa. Hairy: leaves linear, obtuse. Stem erect, woody; branches repeatedly forked, short, spreading, silky; leaves about an inch long, losing their hairs by age.—Native of New Zealand.

4. Pimelea Prostrata. Leaves ovate, sessile, fleshy; nut superior, small, clothed with the permanent silky white corolla, ovate, acuminate, covered with a thin coriaceous rind.—Found on the dry mountains of New Zealand.

Pimenta, or *Pimento.* See *Myrtus.*

Pimpernel. See *Anagallis.*

Pimpinella; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal of many rays; partial of still more; involucre universal none; partial none; perianth proper scarcely observable. *Corolla:* universal almost uniform; florets all fertile; proper, petals five, inflex-cordate, almost equal. *Stamina:* filamenta five, simple, longer than the petals; antheræ roundish. *Pistil:* germen inferior; styles two, very short; stigmas subglobular. *Pericarp:* none; fruit ovate-oblong, bipartile. *Seeds:* two, oblong, narrower towards the top, on one side convex and striated, on the other flat. Essential Character. *Petals:* bent in. *Stigma:* subglobular. *Fruit:* ovate, oblong.—These are hardy perennials, except the seventh, which is an annual plant. They are propagated by seeds, sown in the autumn rather than in spring. When they come up, thin them where they are too close, and keep them clean from weeds: the second year they will flower, and produce ripe seeds. The roots will abide some years in poor land.——The species are,

1. Pimpinella Saxifraga; *Common Burnet Saxifrage.* Leaves pinnate; root-leaflets roundish, uppermost linear. Root perennial, strong, woody, highly aromatic and pungent, to some persons not unpleasant, especially when dry; stems about a foot high, erect, slender, rigid, round, striated, and roughish, varying much in luxuriance, generally branched above; flowers small, white, with long stamina; top of the germen very tumid, and reddish. There is a wonderful diversity in the size and foliage of this species. It often happens that the root-leaves become like those of the stem, and then it has been supposed to be a distinct species. It would be impossible to follow this vegetable proteus through all its changes: we shall only mention the following varieties: 1. The Black-rooted German Burnet Saxifrage: the stalk of this rises nearly two feet high, dividing into several branches, which have one narrow five-pointed leaf at each joint, and are terminated, like the second species, by bunches of white flowers; so that it may be a variety of that species. Willdenow distinguishes it by the pubescence of the stem and leaves: the root-leaves, he says, are subcordate, gashed, blunt, and toothed; the stem-leaves bipinnate and linear. The root, when wounded, pours out a blue milky liquor. It is a native of dry soils in Germany. 2. Root-leaves, described by Withering as doubly winged; the leaflets wing-cleft, with entire segments; stem-leaves doubly winged, with entire leaflets; floral leaves cloven at the end.—Common Burnet Saxifrage is a native of most parts of Europe, and is found in dry, gravelly, or calcareous pastures; flowering from Midsummer through the autumn.

2. Pimpinella Magna; *Great Burnet Saxifrage.* Leaves pinnate; leaflets ovate, the terminating one three-lobed. Root perennial, woody; flavour like that of the preceding species, but rather weaker; stem two feet or more in height, round, striated; flowers commonly white, about the size of the last,

and like them in structure; but in alpine situations they often become rose-coloured. There is a variety with the root biennial and branched; the stem grooved and angular, panicled with branches; flower white; seeds smooth. Found in Austria and the Levant.—The root of this plant is very acrid, burning the mouth like pepper. It affords a blue oil: its acrimony has caused it to be employed in order to cure the tooth-ach; and also for the more important purpose of removing freckles from the skin. It is likewise chewed to promote the secretion of saliva, and is used in gargles for dissolving viscid mucus in the throat. The Germans prescribe it for the dropsy and asthma. The seeds are carminative, they disperse wind in the stomach, and are good in colics: the roots are powerfully diuretic, and may be given with advantage in disorders arising from obstructions of the viscera. The roots are best taken in a strong infusion, and the seeds when reduced to powder; six or seven grains of the latter is a sufficient dose.—Native of the south of Europe, Germany, Switzerland, and England. With us it grows chiefly in woods and hedges in a calcareous soil, flowering in August, and even later. Ray remarks, that it grows in the woods of Cambridgeshire, Bedfordshire, and Kent: it has also been observed in Ripton wood in Huntingdonshire; at Ballard in Worcestershire; in Hollingshall wood, Leicestershire; about Thirsk and Boroughbridge, in Yorkshire; under the walls of York; near Clandon Place in Surry; in Petworth Park; at Brentwood; at Greenhithe; on Hampstead Heath; at Leads near Claremont in Surry; about Guildford and Godalming; between Wimbledon and Merton; in Stow and Noke woods, Oxfordshire; in Wednesbury field, Staffordshire, with a red flower; and in the hedges near Maidstone, Kent, with jagged leaves.

3. Pimpinella Lutea; *Yellow Burnet Saxifrage.* Leaves pinnate, pubescent; leaflets cordate, toothed, gashed in front; peduncles filiform, panicled. Stem smooth, even, leafy below, leafless above, and branched; peduncles nodding; umbels small; petals yellow, very small. It flowers in summer, and has an aromatic odour.—Native of Mount Atlas.

4. Pimpinella Glauca. Leaves superdecompound. Stem angular, very much branched; root fusiform, fibrous, brown without, white within; flowers small, white.—Native of Germany, France, and Italy.

5. Pimpinella Capensis; *Cape Burnet Saxifrage.* Leaves superdecompound; segments acute; stem striated.—Native of the Cape of Good Hope.

6. Pimpinella Peregrina; *Nodding Burnet Saxifrage.* Root-leaves pinnate, crenate; upper leaves wedge-form, gashed; umbels before flowering drooping. Root long, white, and fibrous, of a very sharp taste; stem solitary, two feet high, striated, and branched above. The flowers are white, and the petals hairy on the back. The fruit is very small, and ovate-roundish, crowned with two spreading styles, and separable into two brown seeds, flat on one side, gibbous and striated on the other, and beset with numerous pale bristles; they have no smell, and when first chewed scarcely any taste, but in a short time are very acrimonious, and excite a very great heat in the fauces.—Native of Italy, Spain, &c.

7. Pimpinella Anisum; *Anise.* Root-leaves trifid, gashed; stem-leaves acutely laciniated. Root annual; stem a foot and half high, dividing into several slender branches, which have narrow leaves on them cut into three or four narrow segments; flowers small, yellowish-white; seeds oblong, swelling. It flowers in July, and, if the season prove warm, the seeds will ripen in autumn.—It is a native of Egypt, but is cultivated in Malta and Spain, whence the seeds are annually imported into England. The seeds have an aromatic smell, and a pleasant warm taste, accompanied by a considerable degree of sweetness. In distillation with water, three pounds of them yield an ounce or more of essential oil, which, even when the air is not sensibly cold, congeals into a butyraceous white concrete. Its smell is very durable and diffusive, and its taste milder and less pungent than almost any other distilled vegetable oils. These seeds likewise yield an oil by expression of a greenish colour and grateful taste, strongly impregnated with the flavour of the seeds: sixteen ounces, slightly moistened by exposure to the steam of boiling water, are said to afford one ounce, composed of a gross insipid inodorous oil, of the same nature with common expressed oils, and a part of the essential oil of the seed, on which the flavour depends. The seeds have been long used by physicians as an aromatic and carminative, in preference to those of most other umbellate plants; they have also been esteemed good in pulmonary complaints, and, like those of Fennel, to promote the secretion of milk. Their chief use, however, is in flatulencies, and in the gripes to which children are more especially liable; and they are combined with such purgatives as are likely to produce these effects: weakness of the stomach, diarrhœas, and loss of tone in the primæ viæ, are likewise complaints in which Aniseed are supposed to be peculiarly useful. The essential oil, which is the only officinal preparation now directed by the *Pharmacopœias*, is generally grateful to the stomach, and may be taken in the dose of twenty drops. In diseases of the breast, the oil is preferred; but in flatulencies and colics, the seeds in substance are said to be more effectual. An infusion of them in water quenches thirst, and checks purging. There is a spirituous water distilled from them, and kept in the shops, which may be used for all the above purposes by those who dislike the flavour of the seeds; and if a glass of it be taken after meals, it assists digestion, and prevents the bad effects which sometimes follow a free use of vegetables. The oil is said to be a poison to pigeons.—The seeds of this plant should be sown in the beginning of April, upon a warm border, where the plants are to remain; when they come up, thin them, and keep them clean from weeds. It is too tender to be cultivated for profit in our climate.

8. Pimpinella Dichotoma. Peduncles opposite to the leaves; floriferous leaves twice trifid; petioles membranaceous, winged. This plant is about a foot high, very much branched, and panicled with numerous white umbels.—Native of Spain.

9. Pimpinella Dioica; *Least Burnet Saxifrage.* Umbels very numerous, compound, and simple; flowers diœcous. Root perennial, fusiform, running straight down; stem from half a cubit to a cubit in height, upright, angular, striated, leafy, smooth, very much branched; branches patulous; flowers yellowish or whitish. It flowers in May and June.—Native of Austria, Provence, Switzerland, and England, where it has been found upon St. Vincent's rocks, near Bristol, and above Uphill in Somersetshire.

Pinaster. See *Pinus.*

Pine-Apple. See *Bromelia.*

Pine-Tree. See *Pinus.*

Pinguicula; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth ringent, small, acute, permanent; upper lip erect, trifid; lower reflex, bifid. *Corolla:* one-petalled, ringent; longer lip straight, blunt, trifid, supine; shorter lip bifid, blunter, more spreading; nectary awned, produced backwards from the base of the petal. *Stamina:* filamenta two, cylindrical, curved, ascending, shorter than the calix; antheræ roundish, clapped close to the stigma. *Pistil:* germen globular; style very

short; stigma two-lipped; upper lip larger, flat, reflex, covering the antheræ; lower lip very narrow, erect, bifid, shorter. *Pericarp:* capsule ovate, compressed at the tip, opening at the top, one-celled. *Seeds:* very many, cylindrical; receptacle free, or detached. ESSENTIAL CHARACTER. *Corolla:* ringent, with a spur. *Calix:* two-lipped, five-cleft. *Capsule:* one-celled.——The species are,

1. Pinguicula Lusitanica; *Pale Butterwort.* Nectary blunt, shorter than the petal; scape villose; capsule globular. Root perennial. Like all the rest of this genus, this herb is destitute of a stem, the leaves being radical, spreading, ovate, obtuse, viscid, pale, with reticulated red veins, involute in the margin; stalks several, hairy, especially in their lower part, with short, spreading, glandular hairs, tipped with a viscid fluid; flowers a little nodding; tube of the corolla nearly cylindrical, yellow, streaked with red; capsule exactly globular.—Native of Portugal; found also in England, as about Kilkhampton, and midway from Oakhampton to Launceston; in Stoneham park, Hampshire; on the borders of bogs in Dorsetshire; near Ayr in Scotland; in the islands of Lamlash and Skye; and on Croagh Patrick, in the county of Mayo, in Ireland. It is common in all the western counties; and flowers in June and July.

2. Pinguicula Vulgaris; *Common Butterwort.* Nectary cylindrical, acute, the length of the petal; capsule ovate. This is a smooth plant; the leaves are less involuted; scapes smooth, only a little pubescent at the top; the structure of the stigma, and its close application to the stamina, are very remarkable. Linneus remarks, that the soft upright prickles, which cover the leaf, secrete the glutinous liquor; and that the corolla is violet, purple, and reddish, with white lips, and an ash-coloured woolly spot on the palate. If the fresh-gathered leaves of Butterwort are put into the filtre or strainer through which warm milk from the reindeer is poured, and the milk be set by for a day or two to become acescent, it acquires consistence and tenacity, neither the whey nor the cream separating; and in this state it becomes an extremely grateful food, which is much esteemed in the north of Sweden. There is then no further occasion to have recourse to these leaves, for half a spoonful of the prepared milk, mixed with fresh warm milk, will convert it to its own nature, and so on. This experiment, however, has not succeeded when tried with cow's milk. The juice of the leaves destroys lice; and the country people use the viscid substance found on the leaves to cure cracks in cows' udders. The plant is generally supposed to be hurtful to sheep, and is called *white rot*, because it appears to occasion a disease which the farmers call the rot: but it may be questioned, whether the rot in sheep be so much owing to the vegetables in marshy grounds, as to the *Fasciola Hepatica*, a flat insect called a *Fluke*, from its similitude to a flounder or fluke, and which is found in such situations adhering to stones and plants, as well as in the livers and biliary ducts of sheep affected with the rot. From experiments made on purpose, and conducted with accuracy, it appears that sheep, cows, horses, goats, and swine, will not feed upon this plant.—It is a native of bogs, in many parts of Europe; flowering with us in May and June. It abounds in the northern counties, and in Scotland; also in Norfolk; it has been found on Hinton and Feversham moors, and in the fens near Ely in Cambridgeshire; on the Ampthill bogs, in Bedfordshire; on Bullington green, and under Headington wick-copse in Oxfordshire; on the little bog by Charlton wood near Shooter's hill; on Pets-bog near Chiselhurst; and on the mere near Feversham in Kent; at Harrington and Wellingborough, in Northamptonshire; at Basford Scottum in Nottinghamshire: anciently, it was found growing in Craglose, at Crosby Ravensworth in Westmoreland; upon Ingleborough fells, twelve miles from Lancaster; in Harwood near Blackburn, in the same county; ten miles from Preston, in Aunderness; in the boggy meadows about Bishop's Hatfield; and also in the fens in the way to Wittlesmere from London, in Huntingdonshire; also in Hampshire; and in many parts of Wales. In Yorkshire, says Gerarde, where it doth especially grow, and in greatest abundance, it is called Butterworts, Butter-root, and Yorkshire Sanicle.

3. Pinguicula Grandiflora; *Great-flowered Butterwort.* Nectary awl-shaped, straight, the length of the flower; upper lip spreading, emarginate; capsule ovate. The leaves of this species are twice the size of those of the preceding; as is also the flower, which is of a violet purple colour: spur awl-shaped, the length of the flower; upper lip dilated, emarginate; lower wide, buntly three-lobed, and not deeply three-parted as in the preceding.—Native of the mountains in the south of France, and in Ireland.

4. Pinguicula Alpina; *Alpine Butterwort.* Nectary awl-shaped, reflex, shorter than the petals; corolla white, with a yellow palate, and reflex spur; capsule oblong, beaked. Villars remarks, that the flower is more open, the nectary shorter, and the leaves wider, less elongated, and more yellow, than the common sort.—Native of the Alps, of Lapland, Norway, Switzerland, Austria, Germany, Dauphiny, and Piedmont. It flowers in June.

5. Pinguicula Villosa; *Villose Butterwort.* Scape strict, pubescent; nectary awl-shaped, straight, very short; leaves nerved; corolla violet-coloured, with a spur standing out. It is only one-sixth of the size of the second species, and differs from the first in having the scape strict, the leaves three-nerved, and the flowers smaller.—Native of Lapland, Norway, and Siberia.

6. Pinguicula Crystallina; *Crystalline Butterwort.* Nectary obtuse, shorter than the irregular six-cleft petal; segments of the calix oblong; flower-stalk smooth at the base. This is distinguished by a glandular crystalline clothing like the Ice-plant.—Found in watery places in the island of Cyprus.

7. Pinguicula Elatior. Nectary subulate, obtuse, shorter than the corolla; tube ventricose on the upper side; scape villous beneath; flowers of a beautiful amethystine colour.—Grows in open swamps on the sands of Carolina and Georgia.

8. Pinguicula Lutea. Nectary subulate, recurved, shorter than the campanulated corolla; lips dentated; scape subvillous; flowers yellow.—Grows in the pine-barrens of Lower Carolina.

9. Pinguicula Pumila. Nectary shorter than the tube; corolla somewhat oblong-tubular; scape short, without hair; flowers small, purple.—Grows in the open swamps of Georgia.

10. Pinguicula Acutifolia. Plant very smooth; leaves erect, oval, very sharp.—Grows in shady woods, near rivers in the vicinity of Lake Mistassins.

Pinguin. See *Bromelia.*

Pinus; a genus of the class Monœcia, order Monadelphia.—GENERIC CHARACTER. *Male Flowers*, disposed in racemes. *Calix:* scales of the bud opening, and no other. *Corolla:* none. *Stamina:* filamenta very many, connected at bottom into an upright column, divided at top; antheræ erect, naked. *Female Flowers*, on the same plant. *Calix:* strobile subovate, consisting of scales, which are two-flowered, oblong-imbricate, permanent, rigid. *Corolla:* none. *Pistil:* germen very small; style awl-shaped; stigma simple. *Pericarp:* none; the strobile serves for a calix, having before been closed, but now only converging. *Seed:* nut augmented by a membranaceous wing, which is larger than the seed, but less than the scale of the strobile, oblong, straight on one

side, gibbous on the other. ESSENTIAL CHARACTER. *Male. Calix:* four-leaved. *Corolla:* none. *Stamina:* very many, with naked antheræ. *Female. Calix:* strobiles with a two-flowered scale. *Corolla:* none. *Pistil:* one. *Seeds:* two, winged at the base of each scale.——The species are,

**Pine with two or more Leaves from the same sheathing Base.*

1. Pinus Sylvestris; *Wild Pine Tree,* or *Scotch Fir.* Leaves two in a sheath, rigid; cones ovate, conical, the length of the leaves, single, or two together, rounded at the base. In a favourable soil, this tree grows to the height of fourscore feet, with a straight trunk, and oblique branches; the bark is of a brownish colour, and full of crevices; the wood is the red or yellow deal, which is the most durable of any of the kinds yet known. Few trees have been applied to more uses than this: the tallest and straightest afford masts to our navy; the timber is resinous, durable, and applicable to numberless domestic purposes.—Native of dry, stony, sandy hills in Scotland, and other northern parts of Europe, flowering in May, and ripening seed two years afterwards. This species lives to the age of 400 years or more. From the trunk and branches of this and others of the genus, tar and pitch are obtained; as are barras, burgundy pitch, and turpentine, by incision. The resinous roots are dug out of the ground, in many parts of the Highlands of Scotland; and being divided into small splinters, are used by the inhabitants instead of candles. The fishermen make ropes of the inner bark; and hard necessity has taught the Laplanders and Kamtschadales to convert it into bread: to effect this in spring, they strip off the outer bark carefully from the fairest trees, and collect the soft white succulent interior bark, and dry it in the shade; when they have occasion to use it, they first toast it at the fire, then grind, and after steeping the flower in warm water to take off the resinous taste, they make it into thin cakes, and bake them. Linneus observes, that this bark bread will fatten swine; and that the boys in Sweden frequently peel off the bark in spring, and eat it with the greatest avidity. The manner by which tar is procured, is by cutting the tree into pieces, which are enclosed in a large oven, with a channel at the bottom: a sufficient degree of heat is then applied, by which the tar is forced out of the wood, and runs off by the channel; a process termed *distillatio per descensum.* Tar is properly an empyreumatic oil of turpentine, and has been much used as a medicine, both internally and externally. Tar-water, or water impregnated with the more soluble parts of tar, has been a very popular remedy in various obstinate disorders, both acute and chronic; and though its medicinal efficacy has been greatly exaggerated, the celebrated Dr. Cullen acknowledges that he experienced it to be a valuable medicine, and that it appeared to strengthen the tone of the stomach, to excite appetite, promote digestion, and cure all symptoms of dyspepsia; while at the same time it manifestly promotes the excretions, particularly that of urine. The proportions that have been commonly employed, are two pounds of tar to a gallon of water; these are well stirred together, suffered to settle for two days, and then poured off: from a pint to a quart, according to circumstances, may be taken in the course of twenty-four hours. Dr. Cullen thought that the acid principle gives the virtue to tar-water; and hence the bishop of Cloyne, who first brought tar-water into repute, preferred the Norway tar to that of New England, the former containing more acid than the latter. An ointment of tar is directed both in the London and Edinburgh *Pharmacopœias,* and has been chiefly used in cutaneous disorders. From the cones or Pine apples a diuretic oil is prepared, like oil of turpentine; and a resinous extract, which has similar virtues with balsam of Peru. An infusion of the buds is highly commended as antiscorbutic. The kernels or seeds are excellent restoratives in consumptions, and after long illnesses. The best way of giving them is in an emulsion beat up with barley-water; which is also very good for heat of urine, and other disorders of the urinary passages.—The resinous juice which flows from this tree, either naturally or when it is cut for that purpose, is what we call common turpentine. It is a thick honey-like substance, of a brownish colour, and a strong disagreeable smell. When this turpentine has undergone the operation of being distilled for the oil or spirit of turpentine, what remains in the still is common resin, which is yellow if the fire be extinguished in time, or otherwise black. The several kinds of turpentine and resins are chiefly used for composing plaisters and ointments. Sometimes they are made into pills, and taken inwardly, and are good against the whites, and those runnings which remain after claps when the virulence of the disorder is abated.—The farina of the male flowers is sometimes in spring carried away by the wind in such vast quantities from the forests of these trees, that ignorant persons have been alarmed with the notion of its raining brimstone.——There are several varieties, which we shall briefly notice: 1. The Tartarian Pine. Leaves in twos, glaucous; cones very small. This has a great resemblance to the Scotch Pine, but the leaves are broader, shorter, and their points more obtuse; they emit a very strong balsamic odour when bruised; the cones and seeds are very small, some of the latter are black, and some white. Native of Tartary. 2. The Mountain or Mughoe Pine Tree. Leaves often in threes, narrower, green; cones pyramidal, with blunt scales. The seeds of this are much less than those of the Pinaster, but larger than those of the Scotch Pine. Villars says, it is the most common sort on the mountains of Dauphiny, and that the shortness of the trunk, and other characters, disappears when it grows in lower situations, insomuch that it cannot then be distinguished from the common sort. Native of the Swiss mountains, where it is called Torch Pine, grows there to a great height, is full of resin, and the wood when first cut of a reddish colour. 3. Sea Pine Tree. This has smooth leaves, the cones are very long and slender, and the seeds are about the same size with those of the Pinaster. It grows in the maritime parts of Italy, and the south of France.—*Propagation and Culture.* All the sorts of Pines are propagated by seeds, which are produced in hard woody cones: the way to extract the seeds, is to lay the cones before a gentle fire, or in the sun, which will cause the cells to open, and then the seeds may be easily taken out. If the cones be kept entire, the seeds will continue good for some years; so that the surest way to preserve them is to let them remain in the cones, until the time for sowing the seeds. If the cones be kept in a warm place in summer, they will open and emit the seeds; but if kept cool, they will remain entire for some years, especially those which are close and compact: and the seeds which have been taken out of cones of seven years old, have grown very well, so that they may be transported to any distance, if well ripened and properly packed. The best time for sowing is about the end of March; and when the seeds are sown, the place should be covered with nets, to keep of the birds, otherwise, when the plants begin to appear with the husk of the seed on their tops, the birds will pick off the heads of the plants, and destroy them. Where the quantity of seeds to be sown is not great, it will be a good way to sow them either in boxes or pots filled with light loamy earth, which may be removed from one situation to another, according to the season of the year; but if there be a large quantity of the seeds, so as to require a good space to receive them, they should be

sown on an east or north-east border, where they may be screened from the sun, whose heat is very injurious to these plants at their first appearance above ground. Those seeds which are sown in pots or boxes, should also be placed in a shady situation, but not under trees; and if they be screened from the sun with mats at the time when they first come up, it will be a good method to preserve them. Most of the sorts will come up in about six or seven weeks after they are sown, but the seeds of the Stone or Cultivated Pine, and two or three of the others, the shells of which are very hard, frequently lie in the ground a whole year; so that when the plants do not come up the first year, the ground should not be disturbed, but kept clean from weeds, and the following spring the plants will rise. This frequently happens in dry seasons, and when they are sown in places a little too much exposed to the sun. Hence the surest method is to soak the seeds in water twenty-four hours before they are sown. When the plants appear, they must be constantly kept clean from weeds; and in very dry seasons, if they are now and then gently refreshed with water, it will forward their growth; but this must be done with great care and caution, for if they are hastily watered, it will wash the tender plants out of the ground, or lay them down flat, which often rots their shanks; so that unless it be judiciously performed, it will be the best way to give them none, and only to screen them from the sun. If the plants come up too close, it will be a good method to thin them gently about the beginning of July. The plants which are drawn up may then be planted on other beds, which should be ready to receive them immediately, because their tender shoots are soon dried and spoiled at this season of the year. This work should be done if possible in cloudy or rainy weather, and then the plants will draw out better roots, and will soon put out new fibres again; but if the weather should prove clear and dry, the plants should be shaded every day from the sun with mats, and now and then gently refreshed with water. In drawing up the redundant plants, take care not to disturb the roots of those left remaining in the seed-beds; and on this account, if the ground be hard, it should be well watered some time before the plants are thinned, to soften and loosen the earth; and if, after the plants are drawn out, the beds are also gently watered, to settle the earth to the roots of the remaining plants, it will be of great service to them; but it must be done with great care, so as not to wash out their roots, or lay the plants. The distance which should be allowed these plants in the new beds, is four or five inches row from row, and three inches in the rows. The tender sorts should be sheltered in winter by frames or mats. In these beds the plants may remain till the spring twelve-months after, by which time they will be fit to transplant where they are to remain for good, for the younger the plants are when planted out, the better they will succeed; for although some sorts will bear transplanting at a much greater age, yet young plants set at the same time, will in a few years overtake the large ones, and soon outstrip them in their growth; and there is an advantage in planting young, by saving the expense of staking, and much watering, which large plants require. The best season to transplant all the sorts of Pines, is about the latter end of March or the beginning of April, just before they begin to shoot; for although the Scotch Pine, and some of the most hardy sorts, may be transplanted in winter, especially when they are growing on strong land, where they may be taken with balls of earth to their roots; yet this is not advisable for common practice, being often attended with bad consequences, but those which are removed in the spring rarely fail. Wherever large plantations are designed to be made, the best method will be to raise the plants either upon a part of the same land, or as near to the place as possible, and also upon the same sort of soil; a small piece of ground will be sufficient to raise plants enough for many acres: but as the plants require some care in the first raising, if the neighbouring cottagers, who have many of them small inclosures adjoining to their cottages, or where this is wanting, a small inclosure should be made them for the purpose of raising the plants, and they are furnished with the seeds and directions for sowing them, and managing the young plants till they are fit for transplanting, the women and children may be usefully employed in this work, and the proprietors of land agreeing with them to take their plants when raised at a certain price; it would be a great benefit to the poor, which would ensure their care to prevent the plantations from being destroyed. The Scotch Pine, as was before observed, being the hardest of all the kinds, and the wood of it the most useful, is the sort which best deserves care. This will thrive upon the most barren sands, where scarcely any thing but Heath and Furze will grow; and there are many thousand acres of such land lying convenient for water carriage, which at present are of little profit to any body, that might by plantations of these trees become good estates to their proprietors, and also a national benefit; and as the legislature has taken this into consideration, and passed laws for encouraging such plantations, it can hardly fail to produce great public advantage. And although the present possessors of these plantations may not reap much profit, yet their successors will receive large interest; and the pleasure which those growing trees will afford them, by beautifying the many dreary parts of the country, will in some measure requite their trouble and expense, and at the same time create employment for the poor. The expense of making these plantations is what most people are afraid of: but the greatest cost is that of fencing them from the cattle, for the other is trifling, as there will be no necessity for preparing the ground to receive the plants; and the charge of planting an acre of land with them, will not be more than twenty or thirty shillings, where labour is dear, exclusive of the plants, which may be valued at forty shillings more. The distance at which they should be planted is about four feet, but always irregular, avoiding planting in rows as much as possible; and in the process, the great art is not to take up the plants faster than they can be planted, so that some men have been employed in digging up the plants, while others were planting. Those who take up the plants must be looked after, to see they do not tear off their roots, or wound their bark; and as fast as they are taken up, their roots are covered, to prevent their drying, and put into their new quarters as soon as possible. In planting, take care to make the holes large enough for the roots, and also to loosen and break the clods of earth, and put the finest immediately about their roots, settling it gently down with the foot. If these directions be observed, and a proper season chosen for planting, there will be little doubt of the plants succeeding. After the plantations are made, the only care they require for five or six years, will be to secure the plants from cattle, hares, and rabbits, which will make great destruction in a short time by gnawing the branches, which always greatly retards, and often destroys, the plants. By the time five or six years have past, the branches of the young trees will have met, and begun to interfere with each other: hence they will require cautious pruning. The lower tier of branches only should be cut off in September, at which time there will be no danger of the wounds bleeding too much; and the turpentine will harden over the wounds as the season grows cold, and prevent the

wet from penetrating the wounds. These branches should be cut off close to the stem of the plants, and care should be taken in doing this not to break the remaining branches of the young trees. This work should be repeated every other year, at each time taking off only the lower tier of branches; for if the plantations be much thinned, it will greatly retard their growth, as it generally does that of all trees; but as these trees never put out any new shoots where they are pruned, they suffer more from amputation than those which do. In those parts of France where there are forests of these trees, the proprietors always give the faggots to those who prune the young trees first, for their labour, so that it costs them no money. At the second pruning the proprietor has one third of the faggots, and the dressers have the other two for their work; and afterwards the faggots are equally divided between the workmen and proprietors; but vigilant care must be taken to prevent them from cutting off too much. For about twelve or fourteen years they will require no more pruning, for their upper branches will kill those below where they have not air; but soon after this, if the plants have made good progress, it may be necessary to thin them; but this should be gradually performed, beginning first in the middle of the plantation, leaving the outside close to screen those within from the cold, by degrees coming to them at last, whereby those which were first thinned will have had time to get strength, and will not be in danger of suffering from the admission of cold air. When these plantations are thinned, the trees should not be dug up, but their stems cut close to the ground, for their roots never shoot again, but decay in the earth, so there can no harm arise by leaving them, and then the roots of the remaining plants are not injured. The trees which are now cut will be fit for many purposes; those which are straight will make good putlocks for the bricklayers, and serve for scaffolding poles; so that there may be as much made by the sale of these as will defray the whole expense of the planting, and probably interest for the money into the bargain. The Scotch Pine grows well upon almost every soil. If they do not grow so fast on sand and gravel as on moist ground, the wood is much preferable; for those trees which have been cut down upon moist soils where they have made the greatest progress, when they have been sawn out into boards have not proved so valuable, the wood being white and of a loose texture, whereas those which have grown upon dry gravelly ground have been nearly equal to the best foreign deals: and there is no doubt but the plantations made within the last thirty years will not only turn out greatly to the advantage of their possessors, but of great national utility; this therefore is the sort of Pine that should be planted on barren lands. As the upright growth of these trees renders their wood more valuable, they should be left pretty close together to draw each other up. If they be left eight feet asunder each way, it will be sufficient room for their growth; and if at the first thinning a fourth part of the trees be taken away, the others may stand twelve or fourteen years longer, by which time they will be of a size for making ladders and scaffold poles; so that from this sale as much may be made, as not only to pay the remaining part of the expense of planting, but rent for the land, with interest; and the standing trees will be left for the fortunes of younger children. For further directions, see the 6th species.

2. Pinus Pinaster; *Pinaster*, or *Cluster Pine Tree*. Leaves two in a sheath, somewhat rough at the edge; cones oblong, conical, shorter than the leaf, attenuated at the base; scales echinated. This grows to a very large size; and the branches extend on every side to a considerable distance. The male flowers compose a handsome golden thyrsus, and the females have rich crimson scales. While the trees are young they are fully furnished with leaves, especially where they are not so close as to exclude the air from those within; but as they advance in age the branches appear naked, and all those which are situated below become unsightly: on this account, and because the timber of the Scotch Pine is much preferable to this, it has been more generally propagated.—It grows naturally in the mountains of Italy, and in the south of France, where there are forests of the trees, which, if suffered to stand, grow to a large size; in Switzerland they are frequently cut into shingles for covering their houses, and also for making pitch: in the south of France the young trees are cut for stakes to support vines.

3. Pinus Inops; *Jersey Pine Tree*. Leaves two in a sheath; cones oblong, conical, the length of the leaves, solitary, rounded at the base; scales echinated. This never rising to any great height, is the least esteemed of the whole genus in the country. While the trees are young they make a pretty good appearance, but when they get to the height of seven or eight feet they become ragged and unsightly, and are therefore not worth cultivating here.—It grows naturally in most parts of North America.

4. Pinus Resinosa; *American Pitch Pine Tree*. Leaves two in a sheath; cones ovate-conical, rounded at the base, solitary, shorter by half than the leaf; scales unarmed. In close forests this grows very tall, with a remarkably smooth red bark: the timber is very heavy, and therefore unfit for masts.—Native of Canada, and the western parts of New York.

5. Pinus Halepensis; *Aleppo Pine Tree*. Leaves two in a sheath; cones ovate, conical, rounded at the base, rather shorter than the leaf; scales obtuse. This tree branches out on every side near the root; the branches at first grow horizontally, but turn their ends upwards; their bark is smooth, and of a dark gray colour. The leaves emit when bruised a strong resinous odour. Most of the trees of this species were killed in the severe winter of 1740.—It is a tree of middling growth, and is found near Aleppo, and in several other parts of Syria.

6. Pinus Pinea; *Stone Pine Tree*. Leaves two in a sheath, primordial ones ciliate; cones ovate, blunt, almost unarmed, longer than the leaf; nuts hard. The seeds are more than twice the size of the Pinaster. The kernels are frequently served up in desserts during the winter season in Italy and the south of France; and formerly they were used in medicine here; but Pistachio nuts have been generally substituted for them. The wood is white, and not being so full of resin as many of the other sorts, it is not cultivated for timber, but chiefly for the beauty of its leaves, and for the nuts, the kernels of which are as sweet as Almonds, but with a slight flavour of turpentine. Sir George Staunton states, that the kernels of the Stone Pine are much relished by the Chinese. Native of the south of Europe.—The seeds of this species being so large, may be set in drills, six inches asunder, four inches from each other, and an inch deep. The following spring they may be planted out in rows, two feet asunder, and one foot in the rows; where they must continue two years, and then be removed where they are to remain.——In addition to what has been said concerning these trees, and particularly of the Scotch Pine, under the first species, we here insert the following important additions from various eminent agricultural writers. Bradley advises heath-land, which is generally sandy, and in which we commonly find abundance of morass ground, to be planted with Fir Trees. We have some instances of this sort of land cultivated in this manner. At the earl of Aylesford's, near Guildford in Surry,

we have an example of the good thriving of these trees, upon a hill of common white sand, in which one could hardly expect the least vegetable quality; and the trees now growing there have not been planted more than forty years, although they are more than forty feet high; but it is to be observed that they are hardly six feet asunder, which may be the true cause of their unusual height, and the freeness of their stems from knots. Hunter's directions for raising plantations of Scotch Fir are as follows: Let the cones be gathered in February or March, from thriving young trees; expose them to the heat of the sun, thinly spread on coarse canvass, taking them under cover at night, and only exposing them while the sun shines. When any quantity of the seed is shed, separate it from the cones; otherwise the first dropped seeds would become too dry. The sowing must be finished at the end of April or the beginning of May; so that if the cones will not yield their contents to the sun, they must be gently kiln-dried. A light loamy soil, trenched a foot and half deep, and laid out in beds five feet broad, answers best for sowing. Let the seeds be sown very thick, and covered with a thick sifting of mould from the alleys. The plants will thus rise like a brush, and a good crop will have above a thousand in every square foot. No manure should be given them, that weeds may not be introduced; the drawing up of which brings up many of the tender plants, and by loosening the ground lets in both frost and drought. When they have the growth of two seasons, plant them out irregularly from the seed-bed, three feet asunder, upon the grounds where they are to rise to perfection; planting the driest ground in autumn eighteen months after sowing, and continuing till frost sets in. Begin again in February, or rather as the weather admits, and continue the work if necessary to the end of April. It is best to plant thus from the seed-bed, for when they are removed into the nursery, the roots must be pruned considerably before they can be planted where they are to continue, which adds greatly to the expense; and nursing causes a luxuriant growth in this hardy mountainous tree, which spoils its nature, and robs it of longevity. The trees which grow spontaneously from seed, come up very close, and grow very slow; for these reasons they are taller, less knotty, and of a closer harder grain, than planted trees which are usually set in a richer soil and allowed more room. Mr. Boutcher directs the cones to be gathered or picked up in March or April, and kept in a dry place till the hottest weather, when they should be treated as he has directed for Larch; and afterwards kept in boxes or bags in a dry room till the season of sowing, which should be the middle of March, or as soon afterwards as the land is dry, and the weather favourable, on shady borders of generous loose mould, at the rate of a pound of good seed to a bed of sixty feet long by three feet and a half broad; covering them a quarter of an inch thick. As the plants begin to appear, water them in the morning every four or five days for five or six weeks, if the weather be dry without frost. From the beginning to the middle of April following, transplant them from the seed-bed in rows fifteen inches asunder, and six or seven inches in the row, giving them three or four plentiful waterings if the weather require. Let them remain two years, and they will be fit to encounter all difficulties, and to succeed in the worst soils and coldest situations. For the purpose of immediate shelter, they may be removed once more into rows, three feet asunder, and eighteen inches in the row, to stand two years longer. In all the removals, have by you a tub of water and earth, mixed to such a consistence as that a considerable quantity will adhere to the roots of the plants. As soon as they are taken up, let them be plunged in the tub as deep as they stood in the ground; and if they continue several hours in this situation, so much the better. A plantation of Scotch Pine can be made at much less expense than any other tree in the northern parts of Scotland, because the young plants can be afforded at a smaller price. In Aberdeenshire, plants of two years old (and above that age no experienced planter will ever buy them) sometimes sell at four-pence the thousand, consisting of twelve hundred; and they seldom exceed eight-pence: besides this, there are men who will undertake to complete the whole enclosing and planting at the distance of a yard from each other, and supply the deficiencies for five years, at the rate of from ten to thirty shillings the Scotch acre, according to the size of the enclosure and the nature of the fence. It is found by experience that there is scarcely any soil so bad, or any exposure so bleak, where this tree will not live, if the plantation be of sufficient extent, and not upon the very summit of high peaked hills. They do not indeed bear the sea air very well; nor is the wood ever of a good quality, or the tree long-lived, upon clayey soils. Several planters in the south of England have found that the Pinaster, or second species, bears the sea blast much better than any of the other Pines. The Spruce Fir will bear a still more exposed situation than the Scotch Pine, and after a few years it shoots up with still greater luxuriance. But the cones not being to be had in equal abundance, and the plants being more difficult to rear, they are sold at a much higher price. Silver Fir in a good soil prospers well, and is a beautiful tree, but the price of the plants is too great to admit of large plantations of them being made. Where the situation is bleak, and much exposed to strong blasts of wind, the plantation must not only be of considerable extent, but the trees must be planted very close, so as to be not more than from two to three feet asunder: the more exposed the situation, the closer they must be; for it is observed, that until the branches intermingle, and thus serve to give a mutual support to each other, the trees never begin to advance with vigour. Where the plantations are thus thick, there is a necessity for beginning to thin them out from the tenth to the fifteenth year after planting. Where the plantations are extensive, these thinnings sell at a small price; but there are few situations in which they will not do more than pay for the expense of cutting them out. Their leaves and branches afford a very wholesome nourishment to cattle and sheep. In mountainous countries, where snow sometimes lies upon the ground for many weeks together, the benefit which may occasionally be derived from such plantations will be very great; and the larger branches that are left make excellent fire-wood. The seeds of Pines are better extracted from cones, by laying them in the sun, than by the fire. The application of too great a heat will injure or destroy vegetation in them; and the practice of laying the cones on the floor of a malt-kiln, which is said to prevail with seedsmen, will account for the badness of seed purchased from them. It may also be too old, and should be sown as soon as possible after being taken from the cones; the seeds of the Stone Pine especially, which, whether kept in the cones or taken out, are never good after the first year.

7. Pinus Tæda; *Frankincense Pine Tree.* Leaves three in a sheath; cones oblong-conical, shorter than the leaf, aggregate; scales echinated. The Canadian French built a sixty-four gun ship entirely with the wood of this tree, which is like that of Scotch Pine, but has more resin.—Native of North America. There are several varieties; of which the Three-leaved Virginian Pine Tree is most worthy of notice. There are many of them in the noble plantations of the duke

of Bedford at Woburn, which were twenty feet high when they were not of many years' standing, and kept pace with the other sorts in the same plantation.

8. Pinus Palustris; *Swamp Pine Tree.* Leaves three in a sheath, very long; cones subcylindrical, echinated; branches roughened with ramentaceous stipules. As the leaves are a foot and more in length, growing in tufts at the ends of the branches, they have a very singular appearance; the wood is of little use except for fuel.—Native of Carolina and Georgia. It does not succeed well in most places here; in severe frosts the leading shoots are often killed; and in dry ground it will not thrive: unless the soil be favourable, it is to little purpose to plant this sort of Pine.

9. Pinus Cembra; *Siberian Stone Pine Tree.* Leaves five in a sheath; cones ovate, blunt; scales pressed close; nuts hard. This is confounded with the Swiss Stone Pine; but the cones of the latter are short and roundish, with close scales, whereas those of the Siberian Pine are long, and the scales looser; the leaves have a near resemblance. But the plants raised from Swiss seeds make much greater progress than the others, which can scarcely be kept alive in England. The Cembra Pine grows higher up the Alps than any other species, and is even found at elevations where the Larch will not grow. The wood is very soft, and, having scarcely any grain, is very fit for the carver; hence the peasants of the Tyrol, where this tree abounds, make various sorts of carved works with this wood, which they dispose of among the common people of Switzerland, who are fond of the resinous smell which it exhales. Linneus, and other botanists, make this the same with the Siberian Stone Pine, which resembles it much; but Duhamel and Haller maintain them to be distinct species. The Siberian Pine is lofty and straight, pushing out few side-branches; whereas the Swiss Pine is small, knotty, and often deformed. The wood of the Siberian has no smell, and the cones are different. In the Brianconnois the Cembra is called *Alviez*, and in Savoy *Aroles;* but Villars remarks, in reply to this latter objection, that it has different names in almost every village of Dauphiny. The kernels are good to eat, and yield abundance of oil, which smells a little of turpentine, and is pectoral and diuretic. It is likely to thrive in bleak rocky situations, or on peaty moors; the timber is large, and the bark of the trunk of a whitish cast. Wainscoting, flooring, and other joiner's work, made of the planks, are of a finer grain and more beautifully variegated than deal, and the smell is more agreeable. A white odoriferous resin is extracted from the wood.

10. Pinus Occidentalis; *West Indian Pine Tree.* Leaves five in a sheath, rugged along the edge, very long; cones oblong; scales truncated at top.—Native of the West Indies.

11. Pinus Strobus; *Weymouth* or *White Pine Tree.* Leaves five in a sheath; cones cylindrical, longer than the leaf, loose. This is the most useful and tallest species, often attaining to a hundred feet high in its native country. The bark is very smooth and delicate, especially while the tree is young. The wood is esteemed for masts of ships; and there was a law made in the 9th of Queen Anne, for the preservation of these trees, and to encourage their growth in America.—Found on the sides of hills, in a fertile soil, from Canada to Virginia, flowering in May. It is only within the last half century that they have been propagated in any great plenty in England, though there were some large ones growing in several places long before. The value of the timber in our island, especially in cold soils, is perhaps doubtful; nor will it bear the severity of our winters, and the variableness of our springs, except in particular situations and soils. It is however a very beautiful species, and fit for masts particularly. It grows best upon a moist light soil, not too wet, and will also thrive on a loamy soil, if it does not approach too near to clay. The seeds should be sown with a little more care than the Scotch Pine, because their stems being not so strong, they are more apt to go off while young; if therefore they are sown in the full ground, the bed should be screened with mats from the sun every day, but exposed to the dews every night. If all the plants be removed into beds in July, it will be a sure way to preserve them; but as they grow faster than the Scotch Pine, they should be planted farther asunder, their rows six inches distant, and the plants four inches apart. This will allow them room to grow, till the spring twelvemonth following; when they may be either transplanted where they are to remain, or into a nursery, where they may stand two years to get strength; but the sooner they are planted where they are to stand, the less danger there will be of their succeeding, and the larger they will grow; for although they will bear transplanting at a greater age, yet when they are planted young, they will make much greater progress, and grow to a greater size. When planted in a soft hazel loam, shoots of one year have frequently measured two feet and a half in length; and they have continued for some years to grow in proportion. They should have a sheltered situation, for where the trees have been much exposed to the south-west winds, they have not made half the progress of those which grew in shelter; and in large plantations those on the outside have not kept pace with those in the middle, nor have their leaves retained their verdure so well.

12. Pinus Cedrus; *Cedar of Lebanon.* Leaves tufted, perennial; cones ovate, abrupt, their scales closely pressed; crest of the anthers ovate, flat, erect. This noble tree has a generally striking character of growth, so peculiar to itself that no other tree can be mistaken for it. It is placed by Linneus along with the Larch, in the same genus with the Firs and Pines. The sturdy arms, says Evelyn, grow in time so weighty, as often to bend the very stem and main shaft. The leaves somewhat resemble those of the Larch, but are somewhat longer, and closer set, erect, and perpetually green, which those of the Larch are not, but hanging down, dropping off, and deserting the tree in winter. The cones are tacked and ranged between the branch-leaves, in such order as to appear exceedingly curious and artificial, and at a little distance extremely beautiful; these cones have the bases rounder, shorter, or rather thicker, and with blunter points, the whole circumzoned as it were with pretty broad thick scales, which adhere together in exact series, to the very summits, where they are sometimes smaller; but the entire lorication is smoother couched than those of the Firs; within these repositories under the scales, nestle the small nutting seeds of a pear-shape. Many wonderful properties are ascribed to the wood of this celebrated tree, such as its resisting putrefaction, destroying noxious insects, continuing a thousand or two years sound, yielding an oil famous for preserving books and writings, purifying the air by its effluvia, &c. With respect to its durability, we have better evidence than that of the heathen writers, who say that in the temple of Apollo at Utica a beam of this wood was found perfect at the age of two thousand years. In their relation of its properties there is much vulgar error and confusion; but we know that this was the species of timber employed in building the sumptuous temple and palace of Solomon at Jerusalem; and its durability receives no doubtful confirmation, from their standing so many hundred years, and at last perishing, not by decay, but by fire. The allusion of the royal Psalmist, of spreading abroad "like a Cedar in Libanus," shews that he was well

acquainted with this tree, which is remarkable for the wide spread of its branches, rather than for its height. Had Milton known it as well, he would never have spoken of it as affording an

"*Insuperable* height of *loftiest* shade."

It is not only found on mount Lebanon or Libanus, but on the mountains Amanus and Taurus. Solomon's fourscore thousand hewers must have considerably thinned the forest of Lebanon; and in fact travellers concur generally in the observation, that there are probably more Cedars now in England than are remaining upon that celebrated mountain. Those however which yet remain are preserved with religious strictness, and on the day of the Transfiguration the Patriarch repairs in procession to these trees, where he celebrates a festival, called the Feast of Cedars. The Cedars at Chelsea, which form such prominent objects upon the river Thames, are probably the first that were planted in this country. They still appear to be perfectly sound, and exactly correspond with what has been above stated, of their being rather remarkable for widely spreading branches, than for great height. The following dimensions of a fine Cedar tree, growing at Hillington near Uxbridge, will give the reader an apt idea of the figure of this remarkable tree. The height fifty-three feet; the extent of the branches from east to west ninety-six, from north to south eighty-nine feet; the circumference of the trunk close to the ground, thirteen feet and a half; twelve feet above the ground, fourteen feet eight inches; at the height of thirty feet and a half, just under the branches, fifteen feet eight inches. It has two principal branches, one of which is forked eighteen inches above its origin, before it divides it measures twelve feet round, after its division one of the forks measures eight feet and a half, the other seven feet ten inches. The other primary branch at its origin measures ten feet, and soon dividing out two secondary ones, each five feet and a half; it is supposed to be about 130 years old.—The cones of this tree are frequently brought from the Levant, and we have them now of our own growth. If they be preserved entire, the seeds will keep good in them several years; the time of their ripening is commonly in the spring, and those which come from abroad are nearly one year old before we receive them, for which they are not the worse, but rather the better, the cones having discharged a great part of their resin by lying, and then the seeds are much more easily extracted, than from such as are newly taken from the tree. The best way to get the seeds out is to split the cones, by driving a sharp piece of iron through the centre lengthways, then with your fingers you may pull out the seeds, which you will find fastened to a thin leafy substance, as are those of the Fir tree: but before the seeds are taken out, it will be proper to put the cones in water for twenty-four or thirty hours, which will render them easier to split, so that the seeds may be taken out with greater safety; for there will require care in doing it, otherwise many of the seeds will be spoiled, as they are very tender, and will bruise when there is any force employed in their extraction. Some think it the best mode to thrust a wooden peg down the hole, rather bigger than the iron one, after the cones have been soaked. The seeds should be sown in boxes or pots of light fresh earth in March, and treated as directed for the Firs, only these require more shade and water in summer time while young. When the plants come up, which will be in seven or eight weeks, they must be guarded from the birds, otherwise they will pick off their tops, as they do those of the young Firs; they must also be constantly kept clean from weeds, and not placed under the drip of trees. The plants may remain in these boxes, or in the pots in which they were sown, till the following spring: but it will be proper to place them under a frame in winter, or cover them with mats, if the season proves very severe; for while they are young they are in danger of losing their tops, if pinched by frost, for they often shoot late in the autumn. In April, before the plants begin to shoot, they should be carefully taken up, and transplanted into beds at about four inches' distance, closing the earth gently to their roots: these beds should be arched over with hoops, and covered with mats in the heat of the day, to shade the plants from the sun till they have taken new root; and if the nights prove frosty, it will be proper to keep the mats over them in the night, but in cloudy or moist weather they must be always open. After the plants are well rooted, they will require no other care but to keep them clean from weeds, unless the season should prove very dry, in which case it will be proper to give them some water once or twice a week; but it must only be in small quantities, for too much wet is often very injurious to them; so that it will be better to screen them from the sun in hot weather, to prevent the earth from drying too fast, or cover the surface of the ground with moss to keep it cool, than to water the plants often. In these beds, the plants may stand two years, then in the spring they should be either transplanted to the places where they are designed to remain, or to a nursery where they may grow two years more; but the younger these trees are when planted out for good, the better they will thrive, and the longer continue. When they begin to shoot strong, the leading shoot generally inclines to one side; if therefore you intend to have them straight, support them with stakes, observing to keep the leader close tied up, until you have got them to the height you design them, otherwise their branches will extend on every side, and prevent their growing tall. During the time they are in the nursery, says Marshall, and after planting out, many will frequently have a tendency to droop in their leading shoot; as soon therefore as this is perceived, an upright stake must be driven into the ground, to which the shoots should be tied with bass-matting, to keep them in their upright growth. This, however, will not always effect it; for some plants, in spite of the bandage, will shoot downwards. In this case, when they first discover signs of such a tendency, it will not be injudicious to lighten the head, by nipping off the extremities of some few of the largest branches. When these trees are planted out to remain, they should be left to nature, after being properly fenced; not a knife nor a hatchet should come near them; lopping even their lowest branches is so injurious, that it at once retards their growth, and diminishes their beauty. They were formerly mutilated into pyramids, and sheared as Yews, which wholly ruined their appearance, which consists in the singular extension of their branches. Their shoots being for the most part declining, and thereby shewing their upper surface, which is constantly clothed with green leaves, in so regular a manner as to appear at some distance like a green carpet, and these waving about with the wind, form a most agreeable object at a distance, especially if planted on a rising ground.—See the first and sixth species.

13. Pinus Pendula; *Black Larch Tree.* Leaves fascicled, soft, bluntish; scales of the strobiles covering the bractes. This is not mentioned by botanists, nor has it been long known in Europe: the wood is equal to the European Larch, and the bark excellent for tanning. It does not promise to form such large trees as the European, and therefore should be planted with those of lower growth, to make a variety. It will endure the severest cold of this climate.—Found in low cedar swamps, from Canada to New Jersey, flowering in April and May.

14. Pinus Larix; *Common White Larch Tree.* Leaves fascicled, soft, bluntish; bractes standing out beyond the scales of the strobiles. This is a quick-growing tree, and will rise to the height of fifty feet; the branches are slender, and the ends generally hang down. In the month of April the male flowers appear disposed in the form of small cones; the female flowers are collected into egg-shaped obtuse cones, which in some have bright purple tops, but in others are white: this difference is accidental, for seeds taken from either will produce plants of both sorts: the cones are about an inch long, and the scales are smooth; under each scale two winged seeds are generally lodged. There are three other varieties of this tree; one a native of America, another of Siberia, and another of China. Between the two first there is so little difference in their characteristics that they cannot be distinguished as different species, though in the growth of the trees there is a remarkable difference. The other from China seems to be a sort of Pine, and is so hardy that it will thrive in the open air without any protection. Pallas thus distinguishes the European Larch from the American. In the latter, the branches are more slender, with a bark more inclining to yellow, and the scars more slender and clustered; the leaves are more tender, narrower, more glaucous, and the outer ones in each bundle shorter; cones only one third of the size, blunt, with scales scarcely exceeding twelve in number, thinner, more shining, retuse, emarginate; wings of the seeds straight, more oblong, narrower, and together with the seed itself of a more diluted gray colour. In the European Larch, the bark of the branches is of an ash-coloured gray; the leaves a little wider, bright green, all nearly equal, commonly more than forty in a bundle; the cones an inch long, with above thirty woody, striated, rounded, entire scales; seeds brownish gray, with subtriangular wings somewhat bent in: in both the cones are bent upwards on very short peduncles.—Native of the south of Europe, and Siberia, flowering in March and April. —No tree is more valuable, or better deserves our attention in planting, than the Larch. It has been long cultivated in England. The Venetians employ it not only in houses, but in naval architecture. It seems to excel for beams, doors, windows, and masts of ships; it resists the worm; being driven into the ground, it becomes almost petrified; and will support an almost incredible weight. In Switzerland, where these trees abound, and they have a scarcity of other wood, they build most of their houses with it; and great part of the furniture is also made of the wood, some of which is white, and some red, but the latter is most esteemed. The redness of the wood is by some supposed to be from the age of the trees, and not from any difference between them, but is rather owing to the quantity of turpentine contained in them. They frequently cut out the boards into shingles of a foot square, with which they cover the houses, instead of tiles or other covering: these are at first very white, but after they have been two or three years exposed, become as black as charcoal, and all the joints are stopped by the resin, which the sun draws out from the pores of the wood, which is hardened by the air, and becomes a smooth shining varnish, which renders the houses so covered impenetrable to wind or rain; but as this is very combustible, the magistrates have made an order of police, that the houses so covered should be built at a distance from each other, in order to prevent fires, which have done great damage in villages. In most countries where this wood is plentiful, it is preferred to all the kinds of Fir for every purpose: and in many places there are ships built of it which are reckoned durable. Line-of-battle ships are built with it at Archangel, which generally last fifteen years. Larch wood, says Dr. Anderson, pessesses so many valuable qualities, that to enumerate the whole would appear extravagant hyperbole. It is known to resist water almost for ever without rotting. The piles of this timber, on which the houses of Venice were built many hundred years ago, are still as fresh as when first put in. Stakes of it have been tried in the decoys of Lincolnshire, which between wind and water have worn out two or three sets of oak stakes, without discovering any symptoms of decay. It is also known to possess the valuable property of neither shrinking nor warping when put into work; nor is it liable to be pierced by worms in our climate. It is known to be one of the quickest growing trees, remarkably hardy, and extremely beautiful: being much more easily reared than the Oak, it could be spread over a great extent of mountains, if sufficiently bare of herbage, at little or no expense, by the natural shedding of its seeds. It would be valuable not only for ship planks, but even crooked timbers might be obtained by using a little art to bend it while young. For flood-gates in navigable canals and wet docks, it exceeds every thing that can be obtained in this climate; and would be inimitable for barrel staves. In building, it would answer all the purposes to which Fir is now applied, being much stronger and more durable than that wood. It is next to incombustible; and deserves to be strongly recommended to planters in this country, particularly in the most rugged and barren districts. It is much more valuable than the Scotch Fir for plantations of larger extent in almost every situation. It was first cultivated as an ornamental tree, rather than for profit: but wherever it has been introduced, it grows so freely, is so beautiful when in leaf, or covered with its abundant pink blossoms in the spring, and is so elegant also in its form, that it is sure to become a favourite with the planter. Dr. Anderson says, that the Larch was employed among the Romans, in preference to every other kind of wood, in building, where strength and durability were required: and Vitruvius attributes the sudden decay of buildings erected in his time, in a great measure to the want of Larch in the neighbourhood of Rome; it having been exhausted before his time, and the expense of bringing it from a distance being so high as to amount to a prohibition. The same author has adduced a variety of satisfactory instances and experiments, from which the durability of this wood is established beyond doubt, even in the early stages of its growth. And there are also incontestable proofs of what has been already observed, that it neither shrinks nor warps, and is not liable to be attacked by the worm during the course of several ages. It is not known whether it will resist the *sea*-worm: the experiment might however be tried by sinking a sound well-ripened piece of Larch wood with an equally sound piece of Oak on the river Medway at Rochester bridge, where it is well known that every other kind of wood is very soon perforated by the sea-worm. The assertion above made, that Larch is incombustible, is thus explained: where the masses are large, even if a fire be made upon the bare wood, though it will be slowly corroded by it, yet, unless in particular circumstances, it cannot be made to flame, so as to communicate it to other bodies. On account of its not being liable to warp, or be destroyed by worms, the Italians use it for backboards to place behind fine drawings, when they frame and glass them; as also for picture frames, table frames, &c. because no other wood gives gilding such force, brightness, and as it were a sort of natural burnishing; and this is the grand secret reason why Italian gilding on wood is so greatly preferable to ours, which has often a tarnished spongy cast, and looks like gilt gingerbread. The Italians also prefer it

for making the wheels of post-chaises and other carriages, as being very durable, and unapt to crack. No boards make better wainscoting, or take paint better. The application of it to shingles for covering barns or other out-houses would be a great improvement, as it would look better than thatch; would be impenetrable by wind or rain; and not burning readily, must be still more desirable, because the straw thatch is liable to all these accidents, and harbours vermin and all sorts of filth, to the great annoyance of the grain-houses in buildings so covered. In short, thatch, though cheaper at first, is dearer in the long-run than tiling or slating. The shingles used in the Grisons are half an inch thick and a foot square; being of a tough nature, and nailed down to the rafters, they are not liable to the inconvenience of being broken by forks, like tiles and slates. The thinnings of Larch plantations may be applied to a variety of useful purposes, while they are of a small size. In six, eight, or ten years, according to circumstances, the trees will have attained a size sufficient to be made into hayrakes. They grow so straight, and the wood is so light, strong, and durable, as to be peculiarly calculated for this purpose; and these rakes will remain firmer, and shrink less, than those made from any other wood. About two feet cut off from the root-end will form the rake head; and five feet above that, with a very little taken off from the thickness of the under part, will form the handle. No wood is more proper for the teeth of the rake, than the red wood of a full-grown Larch, because it is not only tough, but little liable either to split or shrink. Nothing is so fit for shafts to hoes; for it is nearly as strong, and much more durable, than ash. Handles for brushes, brooms, scythes, &c. would occasion a vast consumption of the small spars. Light, neat, and strong chairs, for rush bottoms, might be made of Larch wood at this age. Nothing will better answer for hop-poles, one set of which would outlast two or three sets of Ash. Hurdles, spars, and gates, may be made of it, both lighter and more durable than any other wood; and when the trees are sufficiently large, they may be split down for cart-shafts; and in mining countries they might be employed as posts for supporting the roofs of the mines. The small tops cut off in making these various works, would furnish a neat, elegant, cheap, and durable kind of railing, to be put upon the top of low walls, especially for preventing light sheep from over-leaping them. One end might be let into the coping, whether of sod, clay, or lime; and the other end received into a slip of sawn Larchwood, with holes bored through to receive their points. From the straightness of the wood, this kind of rail would be very neat, without much expense. In the same manner, hen-coops, crates for packing earthenware, glass, &c. might be made of those materials. But one of the most extensive and beneficial uses of this kind of small wood, is for the purpose of enclosing. These spars, when the root is thick enough, may be slit up the middle by a saw, and cut into lengths of five or six feet; or if smaller, they may be employed whole. As they are always straight, and nearly of a uniform thickness, if driven into the ground for a few inches, in a row at the distance of a few inches from each other, with the split sides all one way, they would make one of the neatest and most complete fences that can be seen. The tops of these uprights may be received into a piece of sawn plank, with holes bored in it for that purpose; and supported at due distances by sloping pieces reaching from the ground to the top. These are a few of the uses to which the small spires from the first thinnings of the plantations may be applied. As they advance to a larger size, for windows, joists, flooring, pannelling, couples, rafters, and every other purpose in building, they would be superior to any kind of wood hitherto employed for these purposes; and for ship-building, especially planks, it would even be superior to Oak itself. There is not a branch or twig of this tree that may not be put to some useful purpose. The larger branches may be employed in fencing, and the smaller for filling drains, and for fuel. In drains it is more durable than any other wood; and though the timber will not readily burn, yet the brush is found to make a fire almost equal to the billets of many other trees. A most valuable produce of the Larch-tree is the Venice turpentine; which issues spontaneously from the bark; but is more commonly obtained by boring a hole with an auger, about two feet above the ground, till it reaches nearly to the heart of the tree; into this hole is inserted a small pipe or cock, through which the turpentine flows into proper vessels placed for its reception. This process is continued from the end of May till the end of September. When the trees will yield no more for that season, the turpentine is pressed through a cloth to purify it. That so obtained is usually thinner than any of the other sorts, of a clear whitish or pale yellowish colour, a hot, pungent, bitterish, disagreeable taste, and a strong smell, without any thing of the aromatic flavour of the Chian or Cyprus turpentine, obtained from *Pistacia Terebinthus.* The common and Strasburgh turpentine is from the *Pinus Picea;* and the Canada Balsam, which may be considered as the purest of the turpentines, is procured from the Silver and Balm of Gilead Firs. The turpentine of the Larch resides in the bark and wood next to it, as appears when the trunk is sawn transversely; for then it may be seen that the inner wood for more than half the diameter is dry. The turpentine is not to be obtained in considerable quantities from very young trees, and in old ones it gradually dries up, till at last it affords none: it is only after the tree has attained the thickness of ten or twelve inches in diameter, that it is thought worth while to collect the turpentine; and from that time, during forty or fifty years, if it continues so long in vigorous growth, the tree will continue to yield annually from seven to eight pounds of turpentine. All the turpentines dissolve totally in rectified spirit; they become miscible with water into a milky liquor, by the mediation of the yolk or the white of an egg, and more elegantly by mucilages. Distilled with water, they yield a subtile penetrating essential oil, vulgarly called Spirit; a yellow or blackish resin remaining in the still, which forms the common rosin of the shops. The essential oil, on being distilled in a retort, becomes more subtile, and in this state is called Ethereal Oil of Turpentine. The turpentines stimulate the first passages, and prove laxative; and we are told by Dr. Cullen, that half an ounce or an ounce of Venice turpentine triturated with the yolk of an egg, and diffused in water, may be employed in the form of an injection, as the most certain laxative in colics, and other cases of obstinate costiveness. When turpentine is carried into the blood-vessels it stimulates the whole system, hence its usefulness in chronic rheumatism and paralysis. It readily passes off by urine, which it imbues with a peculiar odour; also by perspiration, and probably by exhalation from the lungs: and to these respective effects are to be ascribed the virtues it may possess in gravelly complaints, scurvy, and pulmonic disorders. In all these diseases, however, and especially the last, this medicine, as well as some of the gums and balsams of the terebinthinate kind, by acting as stimulants, are often productive of mischief. Turpentine has been much used in gleets and fluor albus; and its efficacy in the latter is ascribed to its inducing some degree of inflammation in the urethra. The essen-

tial oil, in which the virtues of turpentine reside, is not only preferred for external use, as ambifacient, &c. but also internally as a diuretic; and by Pitcairne and Cheyne, as a remedy for the sciatica, although few stomachs are able to bear it in the doses which they direct. The Larch also yields a kind of manna, and two sorts of gum. The manna is found in the south of France, and is there called Manne de Briançon; it is white, concrete, and sweet, like fine new honey. It is rare, and only met with in little drops, so that it would be difficult to collect a pound of it: the drops are more or less hard, and cleave to the leaves. It has been picked off the turf at sun-rise almost fluid, exactly in the state in which it is found upon the trees. Pallas informs us, that they have this manna in the Russian empire, but that it is very rarely found concrete, being soon washed off by the rains which prevail on the Uralian mountains. He also mentions a gum that is produced by this tree in particular circumstances. When the woods are on fire, which frequently happens in Russia, the Larches are frequently scorched on the side next the flame to the height of several feet. If the scorching penetrate to the pith, the inner part exudes a dry reddish gum, rather less glutinous than gum-arabic, having a slight taste of resin, but wholly soluble in water. It is used in medicine, and the native mountaineers chew it to fasten their teeth, as an antiscorbutic, and highly nutritive substance; they also use it as a glue to fasten their bows. The Siberian ermine hunters, when their ferment or yeast which they carry with them to make the acid liquor which they call *Quass* with, is spoiled by the cold, scrape off the albumen or half-formed substance between the bark and the wood, which is very juicy and sweet, digest it with water over the fire during an hour, mix it with their rye-meal, bury the dough in the snow, and after twelve hours find the ferment ready prepared in the subsiding fæces. Old Larches produce a Fungus which is called *Boletus Laricis* by Jacquin, and by others *Agaricus Purgans*, or Purging Mushroom. It is used in the northern countries as an emetic in intermitting fevers. The body of it is saponaceous, and is used by the females in some parts of Siberia to wash themselves, and even their linen. It was celebrated formerly, but is now deservedly fallen into total disuse, as a medicine. The Tunguses dye the hair of the reindeer with it and the roots of Gallium; which produces a very deep red colour, that might be useful in our dyeing.—*Propagation and Culture.* The great value of this tree is a sufficient justification for the length at which we shall now treat of its culture. Though the cones of the Larch be of their full size in autumn, as the seeds continue ripening all the winter, they should not be gathered till March or April. Then spread them in dry covered places till May or June, and afterwards expose them to the full sun for several weeks, when the cones will open, and many of the best seeds come out, by shaking them in a wire sieve: to get out the rest, split the cones, by driving a small piece of sharp iron through the centre, and then by exposing them again to the sun for a few days; the seeds will shake out, or may be easily picked out with the point of a knife. Though the seeds in the cone are good for four or five years, yet out of it they lose their vegetating quality in a few months: therefore, as soon as they are got out, mix them with fine dry sand, and keep them in bags till the season of sowing, which is the beginning of March, or as soon after as the weather will permit. Sow them very thin in beds three feet and a half broad, with alleys of eighteen inches; clap them gently in with the back of a spade, and sift over them fine compost earth, with one-fourth sea-sand or pit-sand. If the weather be dry, and not frosty, in a fortnight after sowing give them gentle waterings every fourth or fifth day, and in six weeks they will begin to appear. Guard them from birds with nets, and water them every second or third night for three weeks very gently: continue this once in ten or twelve days to the end of August. At the end of March or the beginning of April following, remove them from the seed-bed to the nursery, in rows three feet distant, and six or seven inches asunder; watering them at planting, and once a week for five or six weeks after. At the same time in the succeeding year, remove them to another nursery, in rows three feet distant, and fifteen or sixteen inches in the row; here let them remain two years; by this time they will be five or six feet high, and of a proper size to transplant in exposed situations, on meagre hungry ground. Dr. Hunter directs, that just before sowing, the cones should be opened or torn into quarters by a knife, the point of which must be thrust exactly down the centre, that the seeds may not be damaged: they should then be thrashed in a room. Three thousand cones will generally produce a pound of good seeds; which being winnowed or sieved will be ready to sow in April. When the scales of the cones are so glued together that it is very difficult to separate them without bruising the seeds; let them be laid in heaps six inches thick, in a shady but exposed situation, till the beginning of May. Then let beds four feet in breadth be prepared, newly dug; let the mould be raked to the sides, so as to form a kind of ridge, to prevent the cones from falling into the alleys, which should be two feet wide for the convenience of the weeders. Cover these beds entirely with the cones; and if the weather proves warm and dry, they will presently expand, and shed the seeds. When a sufficient quantity is shed, remove the cones to a second bed, first giving them a shake in a coarse sieve, which will cause a considerable quantity of seed to fall, especially if it be done in the middle of the day: then sift fine mould a quarter of an inch thick over the whole bed. If the weather should be dry, they must be gently watered, and the beds kept clear of weeds. The cones may be removed to a third, and even a fourth bed. The times for laying them on depend on the dryness and warmth of the weather. The seeds should come up thick, or else they will be apt to be thrown out of the ground by the frost. The following spring prick them out in beds, three inches asunder; and the second spring plant them in the nursery, in rows three feet asunder, and eighteen inches in the rows. Hence they may be planted out finally the second or third year after. But as those trees always thrive best that are removed small, they should be planted out as soon as they are of a sufficient size not to be injured by weeds. Dr. Anderson, who laboured for twenty-five years to turn the attention of his countrymen in Scotland towards this useful tree, is of opinion that it should be planted entirely by itself, because as it soon outgrows other trees, where the Larches are thinly scattered, they are exposed to the wind, and their tender top-shoots are apt to be damaged. He therefore recommends that the Larch should be made to shelter itself, by planting it very thick, even so near as two feet. In a plantation made at this distance, the trees have shot up with great rapidity, straight, clean, and healthy. His theory is this. It has been often remarked that no wood of the Fir kind, raised in artificial plantations, ever equals in quality that which is spontaneously produced; the natural wood being closer in the grain, harder, and deeper in colour, with fewer knots in it. The reason is, that in natural woods of Larch and other coniferous trees, the seeds being strewed very thick upon the ground, the plants spring up very close. Being straitened for room, their growth is stinted, and they

struggle for some years which shall get the better. By degrees the weaker plants are overtopped, and die; but still others struggle for life, and maintain the contest; and thus it goes on till they have attained a considerable height, when the boughs of the most vigorous trees spreading out above, overtop all those that are near; and thus a sufficient space is allowed for these trees to flourish, till they attain their full size. During this long struggle, the growth of the trees is slow, and consequently the fibres of the wood very close and hard. The side-branches too, having no room to spread abroad, are kept weak, and are soon suffocated; by the winds and rubbing of the trees round them, these branches are soon broken off, and the bark begins to close over the wound. The stem thus becomes clear of branches and smooth, and all the wood that afterwards grows over it is free from knots. In artificial plantations we follow an opposite course: anxious to admire the progress of our trees, no measures are adopted to retard their progress at an early period, but rather the reverse; and were we even inclined to follow nature, the very expense of planting so many trees on an acre would be a decisive bar to such enterprises. The young trees are of course planted at a considerable distance, and are encouraged to grow as quickly as possible, and thus the wood is coarse in the grain, and soft. The branches too, having room to spread, advance with great luxuriance, and continue to grow till they attain a large size, and of course render the wood full of large knots. Though we cannot afford to make our plantations so thick as those that grow naturally, we should approach as near as prudence will permit; and by planting Larches at two feet distance, should derive profit sufficient to repay all the expenses. At this distance an English statute acre will contain 10,890 plants. Being planted in rows, the younger the better, the ground laid dry, well-fenced, and no grass or weeds suffered to choak them; in this state they may remain six, eight, ten, or twelve years, according to the soil, or the purposes for which the thinnings are wanted, when they should be thinned for the first time. This, however, ought not to be too long delayed, lest the tops, by growing too close, should be so much smothered as to occasion a hurtful gap when the thinnings are taken away. One row should now be wholly taken out, so as to leave the plants four feet apart, and, allowing three rows to remain entire, take out the fourth, and so on. Thus, though the row on each side the opening will lose its support on one side, its branches being still intermixed with those on the three other sides, will give it sufficient support. It is necessary to cut out a row completely, to admit of trailing out the long spires, together with their tops, which could not otherwise be done. In consequence of this opening, the branches above will be permitted to grow more freely, and in this state they should remain till they intermingle again above, when they should receive the second thinning, by taking out the middle row that was left at the first, which will leave the plants in the rows four feet apart, and two feet from each other in the rows. When the branches close again, the third thinning may be given, by cutting out every fourth row crosswise, and the fourth by taking out the cross row that was left between the two contiguous to it. Now the trees in a whole plantation are again reduced to a square, standing four feet apart, and there will then remain 2722 trees on an acre, which deducted from the 10,890 planted, leaves 8168 taken out in successive thinnings. After a proper interval, the trees might be thinned as above described, till they are gradually reduced to squares at eight feet apart, which is perhaps the greatest distance that should be allowed to trees of this kind. At this distance an acre will contain 680 trees. If their thinnings be begun from the sixth to the tenth year from the time of planting, the whole may be completed thus far by the thirtieth or fortieth year of their growth; during which time there will have been sold 10,210 spars, from fifteen to fifty feet in height, and proportional thickness, in each acre. If it be thought advisable to continue the thinning farther after this period, no whole rows ought to be cut out any where, but only a single tree here and there. Now if we suppose that the sale of the spars would be sufficient to defray the expenses of making and upholding the plantation; and that each tree, at fifty years' growth, instead of containing 360 feet of wood, as those at Dunkeld are known to do, should at the same edge measure no more than seventy feet each, which is less than one-fifth of the others; in that case the 680 trees on an acre would contain 476,000 cubic feet of timber, which, at one shilling a foot, would be £2380, from which, if the rent be deducted, at five shillings an acre, which for fifty years is £12. 10*s.* and interest for payment withheld £14. 10*s.* more, there will be a clear profit of £2353, without taking into the account any advantage arising from the turpentine. The late learned Bishop of Landaff, Dr. Watson, remarks, that the highest and most craggy mountainous tracts in our island, two acres of which do not afford sufficient sustenance for six months in the year to one sheep, might with a great prospect of success be planted with Larches; and thus states the probable profit which would attend such plantations. A thousand acres of such land might be enclosed with a circular wall six feet in height, where the stones can be easily got for six shillings an acre, or £300 for the whole: five hundred Larches, two feet in height, so as to enable them to resist the long grass, might be planted on each acre for fourteen shillings; hence a plantation of 500,000 might be made for £1000. Now this sum improved at compound interest, at the rate of £4 per cent, would in sixty years amount to the sum of £10,519: this is the accumulated loss attending the enclosing and planting one thousand acres of rocky land in sixty years. The rent of 1000 acres, at one penny an acre, is £4. 3*s.* 4*d.* a year; in eight years the Larches would be out of all danger from sheep, so that the loss of rent ought only to be estimated for eight years; but £4. 3*s.* 4*d.* a year, though improved after the same rate of compound interest, would not amount to £40 in eight years; say, however, it would amount to £81, which is allowing more than two-pence an acre rent; then would the whole expense in sixty years be £10,600. If the amount of £81 for fifty-two years be taken into consideration, the expense will be £11,222. The sheep are here supposed to be shut out of the plantation for eight years; but if it should be found that sheep will not crop the Larch, and I, says Dr. Watson, have reason to believe they will not, they need not be shut out at all; nor on districts where nothing but sheep are depastured, need any fence be made. The advocates for close planting, instead of five hundred, would require five thousand Larches for each acre: I am not convinced of the utility of such close planting, except where it is intended to nurse up Oaks, or other kinds of wood; but if that mode should be adopted, the thinnings after twenty years' growth would pay the expense of it. At the expiration of sixty years, suppose that only 250 Larches remained on each acre, or that one-half had perished, the probable value of them may be thus estimated. From many experiments made by myself, and collected from others, I find the annual increase in the circumference of the Larch, at six feet from the ground, to be one inch and a half on an average of several years; and this inference has been drawn from the actual admeasurement of Larches in different parts of England and Scotland, and of different ages, from ten years old to fifty. On this supposition

the Larch would measure, one with another, ninety inches in circumference, at six feet from the ground. Such a Larch would measure above seventy at twenty feet from the ground, supposing the length of the tree to be forty feet, neglecting the top; then will its solid contents be eighty-five cubit feet, and its value, at 9*d.* a foot, above three guineas. But as the trees are supposed to be planted in a high, bleak, barren situation, their annual increase may not be so great as was there supposed: instead of being worth, at sixty years after planting, three guineas apiece, admit that they are only worth ten shillings, then would the value of the whole plantation be £126,000; and deducting the whole expense, there would remain a profit of £114,400. The present value of this, to be received sixty years hence, is above £10,000, interest of money at £4 per cent, and will purchase an income of £400 a year. By planting then, a barren estate of 1000 acres is improved from £4. 3*s.* 4*d.* to £400 a-year, reckoning the value of a reversion as a present certainty: sixty years, it is true, is a great part of the life of man, but it ought to be considered as nothing in the existence of a nation, or even of a family, which is a little nation. All waste lands, that will not do for converting into arable or pasture, ought to be covered with wood; the high parts, and especially the sheltered hills in the high parts, with Larch; and the lower with Oak, Ash, &c. Their present application to the summer maintenance of a few miserable sheep, ought not to be persevered in, if any better use can be made of them. Notwithstanding the opinion expressed by the learned prelate, it is certain that cattle and sheep will attack these trees, and therefore ought not to be admitted, even after the trees have attained to a considerable size. An efficient fence is absolutely necessary for a plantation of Larch, because it is extremely impatient of wounds in its bark. The nature of the fence must be determined by circumstances. A stone wall will be the most common, as the trees should be chiefly planted on mountainous tracts, and it is the most effectual, except against light-bodied sheep, which will easily overleap it, unless there be some defence of bushes, or a rail on the top of it. A ditch and bank is by no means an effectual fence against sheep, or even against cattle after some time, unless furze be thrown upon the top of the bank; or in three rows, two of which should be on the slope of the bank, cutting one of the rows close every year, to keep it from becoming open at bottom. When this fence decays, as it will in ten or twelve years, the outer line of Larches being left, will make a fence of themselves, or at least with the assistance of the Sweet Briar or Bramble planted between the trees, and interwoven with their branches, and a rail from tree to tree where it is wanted. To conclude this interesting subject: when we consider the many excellencies of this useful and elegant tree, it must be allowed that it was a great misfortune to this country that it was not sooner introduced and accurately known, for it is a positive fact, that this *alpine* plant was about half a century ago treated as a tender exotic, and planted out with the most assiduous care and diligence in our hot-beds and hot-houses!

15. Pinus Variabilis; *Two and Three-leaved*, or *Yellow Pine Tree.* Leaves elongated, two and three together, canaliculate; strobiles ovate-conical, subsolitary; aculei of the squames incurved.—It is found in most Pine-forests from New England to Georgia.

16. Pinus Rigida; the *Common Black* or *Pitch Pine.* Leaves in threes; sheaths abbreviated; male aments erect-incumbent; strobiles ovate; spines of the squames reflex. Vast quantities of the timber of this kind are imported into Great Britain, where it is chiefly used for flooring, being very heavy and durable, but extremely brittle.—Grows on the plains from New England to Virginia.

17. Pinus Serotina. Leaves elongate, in threes; male aments erect-incumbent; strobiles ovate; aculei of the squames very fine and straight.—Found on the edges of ponds and swamps. This and the preceding species ripen their seeds only after the second year. Pursh strongly suspects this plant to be merely a variety of the preceding. It is from the authority of Michaux that it is here inserted as a distinct species.

18. Pinus Pungens. Leaves in pairs, short, acute; strobiles ovate-conical; aculei of the squames elongate, subulate, incurved; inferior ones reflexed.—Grows on the Grandfather and Table mountains, Carolina.

** Fir. *Leaves solitary, and distinct at the Base.*

19. Pinus Picea; *Silver Fir Tree.* Leaves solitary, flat, emarginate, pectinate; cones cylindrical, erect, with long pointed scales. This is a noble upright tree. The branches are not very smooth, but the bark is smooth and delicate. The upper surface of the leaves is of a fine strong green, and their under has two white lines running lengthwise on each side of the midrib, giving the leaves a silvery look, from which it takes its name. It has been observed in Ireland, that no tree grows speedily to so large a size as the Silver Fir; some at forty years' growth, in a wet clay on a rock, measuring twelve feet in circumference at the ground, and seven feet and a half at five feet high; and one containing seventy-six feet of solid timber. It is found to be excellent for boat-building. A gentleman in Hampshire floored his library with this wood when fresh cut down, and the boards did not contract in the least.—Native of Switzerland and Germany, Dauphiny, Austria, Siberia, Mount Caucasus, &c.—*Propagation and Culture.* The Firs are propagated by seeds, in the same manner as the Pines. A gentle heat will serve to extract the seeds of these, because their cones open much easier than those of the Pines, especially the Silver and Balm of Gilead Firs, which, if permitted to hang late in the autumn, fall to pieces and scatter their seeds. It is best, however, to preserve the seed in the cones till the time of sowing, which is the end of March or beginning of April, in a north or north-east border; covering the seeds about half an inch deep with the same light mould in which they were sown, and netting the beds to keep off the birds. In these beds the plants should remain until the following spring, when there should be a number of beds prepared in the nursery to receive the seedlings. In the beginning of April they should be transplanted into the beds, at the distance of six inches row from row, and in the rows at three inches asunder, setting them in a quincunx order. In removing these plants, they should be very carefully raised up with a trowel, so as not to break off the fibres of the roots, nor should they be kept long out of the ground. During the time they are out, their roots should be covered, to prevent the wind from drying their fibres; and in planting, the earth should be pressed close to their roots to prevent the air from penetrating to them. If the season prove dry, it will be proper to water the plants every week once or twice, according to the warmth of the weather; the beds should also be covered with mats, to screen the plants from the sun and drying winds, until they have taken good root; after which time they will require little farther care than to keep them clean from weeds. In these beds the plants may remain two years, at the end of which they should be transplanted into an open spot of ground, for their roots will in that time meet quite over the beds. This ground to which they are to be removed, should be well trenched, and cleared from all noxious weeds, and

made level. At the beginning of April, just before the plants begin to shoot, will be a good time to remove them. In taking them up, be especially careful not to tear off nor wound the roots: and do not take up too many of them at one time, but rather plant them as fast as they are taken up, that they may be as little time out of the ground as possible. The distance at which they ought to be placed in the nursery, should be four feet row from row, and in the rows two feet asunder. This distance may by some be thought too great; but let it be considered how much their roots spread in the ground, as also that when they are planted nearer together, it will be very difficult to take up the plants again without cutting and tearing off their roots, especially if they are not all taken up clean at the same time: these considerations must have greater weight than that of the loss of a little ground, with all who have any regard for the future welfare of the plants. In planting them, it will be advisable to draw a line across the ground, and to dig out a trench of a foot wide, into which the plants may be placed at the distance of two feet asunder. Then fill the earth into the trench, covering the roots of the plants with the finest parts of it, scattering it carefully between the roots; and when the whole trench is filled in, press the earth gently down with your feet; but by no means tread it too hard, especially if the ground be strong, or apt to bind too close. If the season should now prove dry, the plants should be watered to settle the earth to their roots; and if it should be repeated three or four times during the continuance of a dry season, it will greatly promote their taking new root, and secure them from the injuries of the drying winds. In this nursery the plants may remain two or three years, according to their progress, and should be well weeded during that time, and have the ground between the rows dug every spring; in the doing of which care must be taken not to cut nor injure the roots of the plants: this is all the culture they will require during their continuance in the nursery. When they are transplanted into the places where they are to remain, the necessary care to be taken is, in taking them up not to injure or cut off their roots, and to let them be as little time out of the ground as possible, and while they are out to guard their roots from the drying winds. The surest time for removing these trees is about the beginning of April; for though they may be, and often are, removed with success at Michaelmas, yet the spring is the best season, especially in moist land. Most of the kinds of Firs will bear removing at the height of six or seven feet; but those of two feet high are much better to transplant, and will in a few years gain the ascendant of taller trees. It is not therefore advisable to transplant these trees when they are much above two feet high, especially if they have stood in the nursery unremoved; for then their roots will have extended themselves to a distance, and must be cut in taking them out of the ground: and where great amputation is used, either to the roots or branches of these trees, the quantity of turpentine which commonly issues from the wounds will greatly weaken the trees. There is another advantage also in planting them when small, which is, that they will not require staking to secure them from being blown down by strong winds, which in tall trees is a great trouble and expense: and whoever will give themselves the trouble to observe how much the trees planted at two feet high exceed those planted at a greater height, will be convinced of the truth of what is here advanced. The Silver Fir requires a stronger land than the Spruce, for in dry ground they seldom make any great progress; and many times, even after they have arrived to a considerable size, are destroyed by very dry seasons, where the soil is shallow or too dry: but when they are planted in a proper soil, they grow to a very large size, and are extremely beautiful, having the under surface of their leaves white, and the upper of a dark green colour. It is, however, frequently injured by frosts that happen late in the spring, especially while young: for when they are planted in a warm situation, they are apt to shoot pretty early, and if any sharp frosts happen after they have pushed, the young shoots are killed; so that they lose a year's growth, and are rendered so very unsightly, that many times they are pulled up and thrown away. In cold situations, however, where they do not begin to shoot so early, they are not subject to this disaster; and in many such places they grow to a large size, and exhibit great beauty. Some fine trees of this species of Fir, grew upon natural bogs, where, by extending their roots, they had drained the ground to a considerable distance round them. It is in vain to plant the Silver Fir in hot, dry, or rocky situations, where it commonly loses the top shoots, and the under branches soon become ragged. The largest and most flourishing trees are seen on sour, heavy, obstinate clay, and though for ten or twelve years they do not advance so fast as other Firs and Pines, yet they will outgrow them all in twenty years. In sowing all sorts of Firs, neglect not to clap over the bed with the back of a spade. In the autumn, after sowing, pick off all mossy hard particles from the beds, replacing them with some good soil, and then sifting over some chaff, or rather saw-dust, that has lain some time. In the succeeding spring, and during May and June, water them frequently, and in autumn treat the beds as before. At two years old, when the buds begin to swell, remove them from the seed-bed.—*For the other sorts of Firs*, about the latter end of March or the beginning of April, according to the forwardness of the season, prepare a very moderate bed, in length proportioned to the quantity of seeds to be sown, and, where there are frames which can be spared for this purpose, they may be placed upon the bed; but where these are wanting, the bed should be cradled over with hoops, that they may be covered with mats or canvass; then plunge the beds full of small pots, such as are commonly sold about London for four shillings and two-pence per hundred. These pots should be filled with light undunged earth, and the interstices between the pots may be filled up with any other earth which is nearest to the place; then sow the seeds in these pots, covering them about half an inch with the same light earth. In drying winds the earth ought to be covered, to prevent the moisture from being drawn off too fast, which would prove hurtful to the seeds; nor should the seeds have too much wet, which would be equally injurious; hence they should be seldom watered, and never in large quantities. When there is any appearance of frost at night, the bed should be covered. With this management the plants will appear in five or six weeks' time, when they must be carefully guarded from birds, as was before directed for the common sorts, and also screened from the sun in the middle of the day; but they must now have fresh air admitted to them whenever the weather is favourable. They may also be allowed to receive any gentle showers of rain, but must not have much moisture, which rots and causes them to drop. Upon the judicious care in this point depends the whole success. It may seem strange to many, says Mr. Miller, that I should direct the sowing of the seeds of these trees, which are so very hardy, upon a hot-bed; but from many trials I have always found they have succeeded much better this way than any other, for the gentle warmth of the bed will not only cause the seeds to vegetate much sooner than they would naturally have done in the cold ground,

but the plants will also rise much stronger, and consequently be in less danger of rotting in their shanks. And as the warmth of the bed is only to bring up the plants, so there should be but little dung employed in making it; for after the plants are up, they must be inured to the open air, and treated as hardily as the common sorts. There may be others, perhaps, who will object to the directions given for sowing the seeds in such small pots, because where there is any quantity of the seeds, it is usual to sow them in boxes, or large pots: but most sorts succeed better in small pots.

20. Pinus Balsamea; *Balm of Gilead Fir Tree.* Leaves solitary, flat, emarginate, subpectinate, almost upright above; scales of the cone when in flower acuminate, reflex. This beautiful tree rises with an upright stem, and has very much the habit of the preceding, but the leaves are wider and blunter, disposed on each side along the branches like the teeth of the comb, but in a double row, the upper one shorter than the under; underneath they are marked with a double glaucous line, and each has eight rows of white dots; they are often cloven at top. From wounds made in this tree a very fine turpentine is obtained, which is sometimes sold for the true Balm of Gilead. It has long been cultivated in England, for curiosity; but in general, though it grows to a considerable height, it seldom survives above twenty years. —Native of Canada, Nova Scotia, &c. flowering in May. This, and the Hemlock Spruce tree, should have the beds hooped over, to be covered with mats, for five or six weeks after the plants appear above ground; when the sun is hot, or the air cold and frosty, they should be watered every second evening, when it does not rain. This tree requires a good deep soil, and a sheltered situation. See the preceding and the next species.

21. Pinus Canadensis; *Hemlock Spruce Fir Tree.* Leaves solitary, flat, submembranaceous, sharpish, pectinate; cones ovate, scarcely longer than the leaf. A very elegant tree, growing in some situations to an extraordinary size: its bark is a good substitute for Oak-bark in tanning.—Native of the most northern parts of Canada, and on the highest mountains, as far as South Carolina; flowering in May. The seeds of this species have sometimes remained four or five months, or even a whole year, in the ground, and then come up very well; this caution, therefore, may prevent the pots from being too hastily turned out. The plants of this, and of the preceding species, must be afterwards treated in the same way as the common sorts, with this difference only, that they ought to be transplanted into a more shady situation, and moister soil. For while the plants are young, they will not thrive if much exposed to the sun, or in a dry soil, but when they have obtained strength they will bear the open sun very well, and in a moist soil will make great progress; whereas in dry ground they frequently stint, and produce plenty of male flowers and cones, by the time they get to the height of four or five feet. When the branches of these stems are cut off to trim them up, it should be gradually done, never cutting more than one tier of branches in one year; for if too many wounds are made at the same time on these resinous trees, the turpentine will issue out in such quantities as to weaken and check their growth. The best time for pruning them is in September, at which time they do not abound so much in turpentine as in the spring, and consequently do not bleed so much after pruning. What flows out at that season is seldom more than is necessary for covering the wounds, and to prevent the wet and cold of the succeeding winter from penetrating the wounded parts. These branches should be cut close to the trunk. See the nineteenth species for further directions.

22. Pinus Nigra; *Black Spruce Fir Tree.* Leaves solitary, four-cornered, scattered all round, straight, strict; cones oblong. There is another, called the *White Spruce Fir.* The appellations of White and Black are given on account of the colour of the bark. There is also a *Red Spruce*, between which and the Black there seems to be no real difference, except that the Black is the largest. They all exude a fine clear strong-scented resin, which is much used by the American Indians, to cure wounds and internal disorders. Their young branches are indiscriminately used in making Spruce Beer.—Native of various parts of North America, &c.

23. Pinus Abies; *Norway Spruce Fir Tree.* Leaves solitary, somewhat four-cornered, sharpish, distich; branches naked below; cones cylindrical. This is the loftiest of our European species, attaining to the amazing height of 125 and 150 feet, with a very straight trunk, and throwing out its spreading branches so as to form an elegant pyramid. The vast woods of Norway, Denmark, and Sweden, &c. are principally composed of this, and of the first species of this genus. This tree is called Norway Spruce, because we import its timber chiefly from that country. There are two principal varieties of it, the White and Red, but both afford the white deals: the red deals are those cut from the trees of the first species. Rosin is collected to the quantity of forty pounds annually from each tree. This Fir, and that of the Pinus Sylvestris, was formerly used for building ships, and is still employed for masts, and some other parts, but seldom for the entire vessel, except in small craft: its great consumption now among us is for the interior work of our houses, as beams, joists, rafters, spars, floors, wainscot, doors; and scaffold poles, balks, laths, boxes, and bellies for musical instruments, are also made of Fir. It is exceedingly smooth to polish on, and therefore does well under gilding work; it also takes black equal with the Pear Tree. It succeeds well in carving, the grain being easy to work, and taking the tool every way. No wood takes glue so well, or is so easily wrought; cases and barrels for dry goods, shingles, hoops, &c. are made of it; and it yields pitch, tar, turpentine, and resin; while from the buds and tops the Spruce beer, accounted so excellent in the scurvy, is made. No tree will yield a greater profit in cold land, nor is any more beautiful, standing singly on turf in large plantations, or more useful for shelter in cold soils and situations. An incision being made into the bark of this tree, a clear tenacious fluid issues, which concretes into a resinous substance, known by the name of *Resina Abietis*, which, after being boiled in water, and strained through a linen cloth, is called *Burgundy Pitch.* If, however, the boiling of the native resin be continued till the water is wholly evaporated, and wine vinegar be then added, a substance named *Colophonium* is formed. Burgundy Pitch, which is chiefly imported from Saxony, is of a solid consistence, but rather soft, of a reddish-brown colour, and not disagreeable in smell. It is entirely confined to external use, and was formerly an ingredient in several ointments and plasters. In inveterate coughs, affections of the lungs, and other internal complaints, plasters of this resin, by acting as a topical stimulus, are often beneficial. This tree grows in the deep strong soils of Norway and Denmark, and will also grow in almost any soil and situation in England, provided it be not within the reach of the smoke of great cities, which is very injurious to all sorts of Firs, which do not ever thrive so well in dunged land as in fresh uncultivated soils. They have been brought into disrepute by being brought too close together, or too near other trees, whereby the air has been excluded from their branches, which has occasioned most of their under branches to decay; so that when viewed

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PINUS HALEPENSIS ___ *Aleppo Pine Tree.*

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PINUS NIGRA ___ *Black Spruce Fir Tree.*

H.Frederick sc.

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from the ground under their branches, they have a greater appearance of dead than living trees. But where they have been allowed a good distance, and planted in a strong fresh soil, they have had their branches quite feathered within six or eight feet of the ground, and that too in trees upwards of sixty feet high: hence they ought not to be planted nearer than twelve feet apart, nor should they be so near where the plantation is more than three rows deep; then eighteen or twenty feet will be quite near enough, especially where the trees are designed to have the branches feathered near the ground, in which one of their chief beauties consists.—Native of mountains in various parts of Europe, and the north of Asia, in places watered by alpine rills.

24. Pinus Alba; *White Spruce Fir Tree.* Leaves solitary, four-cornered, the lateral ones curved in; branches almost naked beneath; cones subcylindrical.—See the twenty-second species for farther particulars.

25. Pinus Orientalis; *Oriental Fir Tree.* Leaves solitary, four-cornered.—Native of the Levant.

26. Pinus Fraseri: *Double Balsam Fir.* Leaves solitary, erect; cones ovate-oblong, erect; bracteoles elongate, reflex, oblong-cuneate, emarginate, slightly mucronate, inciso-denticulate.—Grows on the high mountains of Carolina, and on the broad mountains of Pennsylvania.

27. Pinus Taxifolia; *Nootka Fir.* Leaves solitary; planes subdistich; cones oblong; anthers didymous.—Grows on the banks of the river Columbia, and on the north-west coast of America. This elegant and tall tree has some resemblance to the Pinus Canadensis, but the leaves are more than twice the length, and entire; the cones also are longer, and differently shaped.

Piper; a genus of the class Diandria, order Trigynia.—Generic Character. *Calix:* spathe none, perfect; spadix filiform, quite simple, covered with florets; perianth none. *Corolla:* none. *Stamina:* filamenta none; antheræ two, opposite, at the root of the germen, roundish. *Pistil:* germen larger, ovate; style none; stigma three-fold, hispid. *Pericarp:* berry roundish, one-celled. *Seed:* single, globular. Essential Character. *Calix:* none. *Corolla:* none. *Berry:* one-seeded.——The species are,

1. Piper Nigrum; *Black Pepper.* Leaves ovate, commonly seven-nerved, smooth; petioles quite simple. Stem shrubby, very long, round, smooth, jointed, swelling towards each joint, slender, branched, scandent or trailing, rooting at the joints; flowers sessile, lateral, and terminating in simple longish spikes, opposite to the leaves; berry globular, of a red brown colour.—It grows spontaneously in the East Indies and Cochin-china, and is cultivated with such success in Malacca, Java, and especially Sumatra, that it is exported from thence, and from Cochin-china, to every part of the world, wherever a regular commerce has been established. White Pepper was formerly supposed to be of a different species from Black; it is however nothing more than the ripe berries deprived of their skin, by steeping them about a fortnight in water, and afterwards drying them in the sun. The berries also that fall to the ground when over-ripe, lose their outer coat, and are sold as an inferior sort of White Pepper. Black Pepper is the hottest and strongest, and therefore most commonly used for medicinal as well as culinary purposes. It differs from most of the other species in this, that its pungency resides not in the volatile parts or essential oil, but in a substance of a more fixed kind, which does not rise in the heat of boiling water. This fixed substance is probably the resinous part: the aromatic odorous matter seems to depend upon the essential oil. The distilled oil smells strongly of the Pepper, but has very little acrimony; and the remaining decoction, inspissated, yields an extract of considerable pungency. A tincture made in rectified spirit is extremely hot and fiery. Some have supposed Pepper to be less heating to the system than other aromatics. It is generally used as an aromatic and stimulant; and has been successfully employed in some cases of vertigo, in paralytic and arthritic disorders. Given in large doses, it has been found a remedy for intermittents; but it is said, in some instances, to have produced fatal consequences in this disorder. The berries are excellent against all coldnesses and crudities at the stomach. They give an appetite in such cases, and help digestion; they are also good for dizziness of the head, in obstructions of the liver, and against the colic. We frequently neglect things as medicines that we use for food; but there are few things of its kind so strong as Pepper, when taken alone, and on an empty stomach.——The following is a brief account of the method of planting and cultivating the Pepper vines, at Tellicherry on the Malabar coast. They are planted in low firm ground. In the beginning of June, when the rain falls incessantly, at the foot of a Jack, Mango, Cajou, Murica, or any other tree, the bark of which is rough and prickly, they dig a hole one foot deep, six inches in length and breadth, and into this hole put a piece taken from the extremity of one of the branches of a Pepper vine. They then fill it up with earth, taking care that no water shall have access to the plant. In the month of July, the roots are found to extend themselves, and the sprouts appear on the surface, and are tied to the tree, when a circular bank of earth is thrown up round them, that they may enjoy the moistness of the water, which remains on the ground, and be thereby kept from being inflamed by the heats, which last till October. When the rains are over, they cover the root of the vine with fresh leaves, it matters not from what tree, if they do but possess a cooling quality. When the ground is too dry, they water it morning and evening, but only twice in eight days when they find it perfectly cool. They plant five or six sprigs at the foot of the same tree, taking particular care that they do not touch one another. Ten days after the rains are set in, they remove the leaves that cover the root of the vine, pull up the neighbouring grass, and demolish the circular bank of earth made to contain the water, that none may remain at the foot of the tree. This they repeat in the month of August; and cherish the vines in this manner for three years. It must be observed, that the foot of the vines should be covered every year in the manner before mentioned. If the vine should be once overpowered by heat, it will begin to languish, and produce no fruit; so that it is necessary to follow the preceding instructions. The leaves ought likewise to be removed in the month of June, to prevent the white ant from eating the root of the vine, those vermin being much given to eat the leaves, which the rain draws into the ground, and thereby come to the roots of the vine, which they prey upon likewise. Observe also that the Pepper vine in its native countries is not too much affected by the heat of the sun, on account of the proximity of water. It is never planted at the foot of trees with smooth barks, as it would soon fall to the ground.—All the plants of this genus require a warm stove to preserve them in England. They may be propagated by seeds, if seeds can be procured fresh from the countries where they grow naturally. They should be sown upon a good hot-bed in the spring, and when the plants come up, and are fit to transplant, they should be each put into a separate small pot filled with light fresh earth, and replunged into a hot-bed of tanner's bark, shading them every day till they have taken fresh root; then they must be treated in the same way as other tender exotic plants, admitting fresh air to them daily, in proportion to

the warmth of the season, to prevent them from drawing up weak; and when the nights are cold, the glasses of the hot-bed should be covered with mats to keep them warm. As the stalks of most of these plants are tender when young, they should not have much wet, which would rot them; and when water is given to them, it must be with caution not to beat down the plants; for when that is done, they seldom rise again. In autumn they must be plunged into the tan-bed of the bark-stove, and be sparingly watered in winter. They require the same warmth as the Coffee Tree; and in summer should have a large share of air in hot weather, but must be constantly kept in the stove.

2. Piper Betle; *Betel.* Leaves somewhat oblong, acuminate, seven-nerved; petioles two-toothed. Stem shrubby, manifold, very long, trailing, and rooting at the joints; spikes slender, solid. Native of the East Indies.—It is the leaf of this species of Pepper plant which is called Betle or Betel, and serves to inclose a few slices or bits of the Areca, (thence erroneously called the *Betel-nut;*) these, together with a little chunam or shell-lime, are what the southern Asiatics so universally chew to sweeten the breath, and strengthen the stomach: the lower class of people there use it, as the European rabble do tobacco, to keep off the calls of hunger. The consumption of it, like that of tobacco in Europe, is so great as to form a considerable branch of commerce; the Asiatics deem it the height of ill breeding to address a superior without having some of it in their mouth; and this, as it does not poison one, nor disgust the other, like the filthy weed to which civilized nations resort, is not without a plausible excuse. The worst effects it produces, is that of destroying the teeth; to which chewing and smoaking tobacco also essentially contribute, though they are more speedily ruined by the Betel, or rather by the lime that is always used with it. The women of Canara, on the Malabar coast, stain their teeth black with antimony, which preserves them good to old age; while the men, who are great Betel-chewers, seldom retain theirs till they have reached their prime.

3. Piper Cubeba; *Cubebs.* Leaves obliquely ovate, or oblong, veined, acute; spike solitary; peduncles opposite to the leaf; fruits pedicelled. This is a very smooth shrub, with a jointed flexuose stem.—Native of the woods in the island of Java, and of Sierra Leone.

4. Piper Clusiæfolium. Leaves obovate, blunt, veined; spike solitary, terminating. Stem perennial, thicker than a quill, branched, a foot high, at first upright, but afterwards becoming decumbent from the weight of leaves and branches, and throwing out roots from the joints; by which perhaps in its native soil it fastens itself to trees. The whole plant is smooth.—Native of the West Indies.

5. Piper Capense; *Cape Pepper.* Leaves ovate, nerved, acuminate; nerves villose. It is distinguished from the other larger species of the genus, which it resembles very much, by having the veins of the leaves villose on the lower surface. —Native of the Cape.

6. Piper Malamiris. Leaves ovate, sharpish, rugged underneath; nerves five, raised underneath; stems round, striated, twining.—Native of both Indies.

7. Piper Discolor. Leaves broad, ovate, five-nerved, very smooth, discoloured on the hinder part; spikes more lax; florets more remote. This is a shrub a fathom in height, with alternate, erect, subdivided, jointed, round, smooth branches.—Native of the high mountains of Jamaica, where it is found flowering in autumn. It varies with leaves attenuated at the base, and blunt ovate-oblique.

8. Piper Medium. Leaves ovate, acuminate, oblique, subcordate at the base, five-nerved; spikes axillary, nodding. It has several trunks eight feet high, two inches in diameter at the base, upright, jointed, knobbed, ash-coloured; branches numerous, round, swelling at the joints.—Native country unknown.

9. Piper Amalago; *Rough-leaved Pepper.* Leaves lanceolate-ovate, five-nerved, wrinkled. This is a shrub, from three to ten feet in height; stem even; branches dichotomous, jointed, subdivided, round, brownish green; flowers clustered. Browne calls it Small-grained Black Pepper, and says that it grows very common in most of the hilly parts of Jamaica, looking very bushy, and spreading on account of its tender flexile branches; it begins to divide very near the root, and rises in tufts, frequently to the height of six or eight feet or more. He used it for many months, and could not perceive any sensible difference between it, and that of the East, either in cookery or seasoning. The berries differ from the Black Pepper of the East Indies only in size, being seldom bigger than a large Mustard seed; but the taste and flavour is in every respect the same. It should be picked when full grown before it ripens; for, like the Pimento and other spicy grains, it grows soft and succulent by maturity, and loses its pungent flavour: it may then be dried in the sun, like the Pimento, and left adhering to the spikes, which seem to have the same flavour and pungency with the grain itself, and are as easily ground in the mill. The leaves and tender shoots are used in discutient baths and fomentations, and sometimes are pounded and applied to foul ulcers: the root is warm, and may be successfully administered as a resolutive, sudorific, or diaphoretic; but it answers best in infusions or light decoctions, which may be varied in strength as occasion requires. There is no deobstruent of this nature that answers better in dropsies, or lighter obstructions from clammy toughness or inertion.—Native of Jamaica, Hispaniola, and Barbadoes.

10. Piper Siriboa. Leaves cordate, commonly seven-nerved, veined; stems hollow, shrubby, about four feet high, divided into many small branches. The spikes come out from the side of the branches.—Native of the East Indies and New Caledonia.

11. Piper Excelsum. Leaves orbicular-cordate, commonly seven-nerved; peduncles terminating, solitary, bifid; stem arboreous.—Native of New Zealand.

12. Piper Longum; *Long Pepper.* Leaves cordate, petioled, and sessile; stems shrubby, round, smooth, branched, slender, climbing, but not to any considerable height; flowers small, in short dense terminating spikes, which are nearly cylindrical. The berries are very small, and lodged in a pulpy matter: like those of Black Pepper, they are first green, and become red when ripe: they are hottest to the taste in the immature state, and are therefore gathered whilst green, and dried in the sun, where they change to a blackish or dark grey colour. Dr. Cullen observes, that Long Pepper has the same qualities with the Black, but in a weaker degree. —Native of the East Indies, especially of Java, Malabar, and Bengal.

13. Piper Methysticum; *Intoxicating Pepper,* or *Ava,* or *Kava.* Leaves cordate, acuminate, many-nerved; spikes axillary, solitary, very short, peduncled, spreading very much; stem dichotomous, spotted, attaining the height of a fathom. The root of this plant bruised, or more frequently chewed in the mouth and mixed with the saliva, yields that nauseous, hot, intoxicating juice, which is so acceptable to the natives of the South Sea Islands, and is spoken of with such just detestation by our voyagers. They pour the liquor of the Cocoa-nut, or pure water, into it; but the less it is diluted, the more this acrid, poisonous, and nauseous beverage,

is esteemed among the chiefs, to whom the use of it is mostly confined, because they become intoxicated, and then fall asleep the sooner. The consequences of a free use of this most disgusting liquor are described as dreadful. The eyes and the whole body are inflamed, the skin becomes parched up, exfoliates in scales, and throws out leprous ulcers, till at length decay and consumption ensue: and yet even those who are accustomed to it cannot take the nauseous draught without making wry faces, and their limbs quaking with horror. In Otaheite it is called *Ava;* in the Friendly and Sandwich Islands *Kava*, with a strong aspiration. It is diligently cultivated in all the islands of the South Sea, except the New Hebrides and New Caledonia. The ground is dug over several times, and well-cleared from weeds, and then manured with shell or coral lime.

14. Piper Latifolium; *Broad-leaved Pepper.* Leaves orbicular, cordate, nine-nerved; spikes axillary, aggregate, peduncled. This has none of the intoxicating qualities of the preceding, though it is a native of the Society and Friendly Islands, of the New Hebrides, and in short of almost all the islands of the South Sea within the tropics.

15. Piper Decumanum; *Plantain-leaved Pepper.* Leaves cordate, nine-nerved, netted; stems several, shrubby, upright, branched, smooth, a little knobbed, the height of a man or more, an inch and upwards in thickness at the base; when old, brown; when young, green. When adult, it throws out roots from the joints. It has an aromatic smell, but an unpleasant taste.—Native of the Caraccas.

16. Piper Reticulatum; *Netted-leaved Pepper.* Leaves cordate, seven-nerved, netted; stem round, upright, smooth, a fathom high. The spikes come out from the side of the branches opposite to the leaves; they are slender, and about five inches long, a little bending in the middle, and are closely set with very small herbaceous flowers.—Native of Jamaica, Martinico, Hispaniola, and Brazil.

17. Piper Aduncum; *Hooked-spiked Pepper.* Leaves oblong-ovate, acuminate, unequal at the base, veined; spikes solitary, axillary, uncinate. Stems several, shrubby, round, knobbed at the joints, smooth, an inch and more in thickness, branched, ash-coloured, upright, eight feet high. The spikes of flowers come out from the side of the branches, opposite the leaves; they are slender, five inches long, and incurved, closely set with flowers their whole length.—It is called Spanish Alder in Jamaica, where it is a native, as also of Barbadoes, St. Domingo, and the Caraccas.

18. Piper Macrophyllum. Leaves elliptic-ovate, acuminate, smooth, unequal at the base, veined; petioles appendicled; spikes axillary, solitary; stem round, striated. It is a large shrub, two fathoms high.—Native of the West Indies.

19. Piper Geniculatum; *Jointed Pepper.* Leaves oblong, acuminate, oblique, many-nerved, smooth; stem and branches jointed. Stem subdivided towards the top, round, smooth, about twelve feet high.—Native of the stony woods of Jamaica.

20. Piper Verrucosum; *Warted Pepper.* Arborescent: leaves oblong, acuminate, obliquely many-nerved, veined, smooth, coriaceous; stem and branches warted. This tree is from fifteen to twenty feet high, distinguished from its congeners by its habit, its warted stem and branches, and its large coriaceous leaves.—Native of the interior of Jamaica, where it is found on calcareous rocks.

21. Piper Hispidum; *Hairy-leaved Pepper.* Leaves ovate, acuminate, oblique, hirsute, wrinkled, nerved, alternate, veined; spikes erect. Stem six feet high, upright, round, hirsute, hispid.—Native of the cooler mountains of Jamaica.

22. Piper Nitidum; *Shining-leaved Pepper.* Leaves lanceolate-ovate, oblique at the base, smooth, shining. This also is a shrub, the height of a man, very much branched, with a smooth round trunk; flowers very much crowded. It flowers in spring.—Native of the mountain-woods of Jamaica.

23. Piper Pellucidum; *Pellucid-leaved Pepper.* Leaves cordate, petioled; stem herbaceous; stalks succulent seven or eight inches high. The spikes of flowers come out at the end of the stalks; they are slender, about an inch long, and straight; the flowers are very small and sessile, appear in July, and are succeeded by very small berries, each containing a small seed like dust.—It is annual, and a native of South America and the West India islands, where it is found on the gravelly banks of torrents and rivers, being fond of moisture. In Martinico they eat the leaves as salad, with lettuce alone, with oil and vinegar, and call it Cresson, but its smell and taste are too powerful for most Europeans.—It flowers from April to September, and, if the seeds are permitted to scatter, the plants will come up without trouble; or, if the seeds be saved, and sown upon a hot-bed in the spring, the plants will rise easily. Transplant them afterwards into separate pots, and plunge them into a hot-bed of tanner's bark, treating them as other tender plants; but they should not have much water.

24. Piper Alpinum. Herbaceous: stem erect, nearly simple; leaves ovate, roundish, acute, veinless underneath; spikes axillary.—Native of the highest mountains of Jamaica, where it flowers in February and March.

25. Piper Hispidulum. Herbaceous, almost upright: leaves roundish, petioled, very thin, rough-haired above. Roots small, capillary, divided, whitish; stem two or three inches high, jointed, diffused, round, striated, smooth, pellucid, succulent, brittle. The taste is bitter, not aromatic. It is an annual plant, and flowers early in spring. Native of Jamaica, in moist woods on the Blue mountains.

26. Piper Tenellum. Herbaceous, simple, decumbent; leaves distich, ovate, veinless, ciliate at the edge; spike ascending. Root small, annual, simple, filamentose; stem three or four inches high; flowers very minute; berry on a pedicel, three times as long as the germen, containing one seed; when ripe it is the size of a small pin's head, of a blackish colour, and of an aromatic flavour.—Native of Jamaica on the cooler mountains, on trunks of trees, especially such as are rotten, hanging down among the moss, and flowering in summer.

27. Piper Acuminatum. Herbaceous: leaves lanceolate-ovate, nerved, fleshy; stem almost upright.—Native of South America, in moist woods, commonly on the trunks of rotten trees.

28. Piper Blandum. Leaves in threes, lanceolate, acuminate, three-nerved, ciliate, dotted underneath; stem a foot and half high.—Native of the Caraccas.

29. Piper Amplexicaule. Subherbaceous: leaves lanceolate-ovate, embracing, nerved, fleshy; stem simple. This species is easily distinguished by the leaves embracing the stem.—Native of Jamaica and other West India islands, on rotten trees, and among the remains of those which have fallen.

30. Piper Pallidum. Leaves alternate, obovate, commonly three-nerved; spikes solitary, subterminating.—Native of the Society Isles.

31. Piper Obtusifolium; *Blunt-leaved Pepper.* Leaves obovate, nerveless. This sends out from the roots many succulent herbaceous stalks, almost as large as a man's little finger. The spike is straight, erect, and about the size of a goose-quill, closely covered with small flowers, which

require a glass to be discerned: the whole spike much resembles the tail of a lizard, which led Plumier to call it *Saururus*.—It flowers from April to September; and is a native of South America and the West Indies. It rarely produces seeds in England, but increases very fast by the stalks, which put out roots, as do many other species: it should have little water, especially in winter. If the plants be plunged into the tan-beds in the stove, the stalks will strike new roots into the tan, and may be cut off to produce new plants.

32. Piper Retusum. Leaves obovate, retuse.—Native of the Cape of Good Hope.

33. Piper Glabellum. Herbaceous: leaves ovate, acuminate; stem declined, rooting, very much branched. It is nearly allied to the twenty-seventh species, but differs in having a weak stem, very much branched, somewhat creeping and rooting; the leaves ovate-acuminate, less, and not so thick; spikes smaller and shorter. It flowers in spring. —Native of the West Indies.

34. Piper Serpens. Herbaceous: leaves roundish, acute, flat, discoloured; stem creeping.—Native of Jamaica, in rocky woods, among moss.

35. Piper Cordifolium. Herbaceous: leaves obcordate, petioled, plano-convex, fleshy; stem creeping; flowers very minute, whitish. The whole plant has a sharp taste. It is very distinct from the others in the leaves.—Native of Jamaica in old woods, and upon decaying trees.

36. Piper Nummularifolium. Herbaceous: leaves orbicular, concavo-convex; stem filiform, creeping, rooting.—Native of the interior of Jamaica, on old trees.

37. Piper Rotundifolium. Herbaceous: leaves roundish, flat, fleshy; stem filiform, creeping; spikes terminating, shortly peduncled, round, solitary, small. Jacquin observes that the leaves are greasy to the touch, of a bright green, with a peculiarly fragrant reviving odour, entitling them to be ranked among the aromatics and cephalics, and which they retain for several years when dried; he has seen a distilled water from them, yielding the pleasant scent of the plant. —Native of Jamaica and Martinico, in close moist woods, covering the entire mossy trunks of old trees, and on stones covered with moss.

38. Piper Maculosum. Leaves peltate, ovate.—Native of Dominica.

39. Piper Peltatum. Leaves peltate, orbicular, cordate, blunt, repand; spikes umbelled. It is readily distinguished by its large peltate leaves.—Native of Jamaica and Dominica.

40. Piper Subpeltatum. Leaves subpeltate, orbicular-cordate, acuminate; spikes umbelled.—Native of Amboyna and Baley, in woods among the mountains.

41. Piper Distachyon. Leaves ovate, acuminate; spikes conjugate; stem rooting.—Native of the mountains of Jamaica, Hispaniola, and Dominica.

42. Piper Umbellatum; *Umbelled Pepper*, or *Santa Maria Leaf*. Leaves orbicular-cordate, acuminate, veined; spikes umbelled; stem erect, grooved, pubescent; root annual.—Native of the West Indies. Browne says it is very common in the woods of Jamaica, and is seldom more than three or four feet high; that the leaves are very large and round, and the foot-stalks embracing the stem at the insertion. Piso affirms the root to be a warm active remedy against poisons; and that a syrup is made of it in many parts of the sugar colonies, which is much used by the inhabitants in colds and catarrhs.

43. Piper Trifolium; *Three-leaved Pepper*. Leaves in threes, roundish.—Native of South America.

44. Piper Pereskiæfolium. Leaves in whorls of three or four, elliptic, three nerved, smooth; spike terminating, solitary; stem spotted.—Native of Venezuela.

45. Piper Polystachyon; *Many-spiked Pepper*. Leaves in whorls, rhomb-ovate, quite entire, petioled, three-nerved, pubescent; root perennial, creeping. The whole plant has an unpleasant taste, but hardly any smell.—Native of the West Indies.

46. Piper Quadrifolium. Leaves in fours, wedge-form, ovate, emarginate, subsessile; stem erect.—Native of South America and Jamaica, on very lofty woody mountains.

47. Piper Verticillatum; *Whorl-leaved Pepper*. Leaves in whorls four together, elliptic, blunt, three-nerved.—Native of Jamaica.

48. Piper Stellatum; *Starry-leaved Pepper*. Leaves in whorls, three, four, or five together, oblong, acuminate, three-nerved; root simple, filamentose, whitish; flowers very minute, green.—Native of the mountain woods in Jamaica.

49. Piper Reflexum; *Reflex-leaved Pepper*. Leaves in fours, rhombed, fleshy, reflex, and patulous; stem creeping; roots filiform.—Native of the East Indies, on the trunks of old trees: found also at the Cape of Good Hope, and in the South Sea Islands.

50. Piper Pulchellum; *Small-leaved Pepper*. Leaves in fours, subsessile, oblong, nerveless, quite entire; stem round; spikes terminating. It flowers from July to September, and is a native of Jamaica.

51. Piper Filiforme. Herbaceous: leaves linear, blunt, the uppermost in whorls; stem filiform, creeping; roots capillary. Willdenow observes that it is very nearly related to the preceding species.—Native of Jamaica, among the moss at the roots of trees on high mountains.

52. Piper Ovatum. Leaves ovate, veined, many-nerved, equal at the base; berries pedicelled, distant; branches even. —Native of Trinidad.

53. Piper Caudatum. Leaves cordate, nine-nerved, veined, smooth, attenuated, with a deep sinus at the base; stem shrubby, round, smooth, even.—Native of Brazil.

54. Piper Rugosum. Leaves ovate-oblong, veined, smooth, nearly equal at the base, netted underneath; branches even; petioles simple.—Found in Cayenne.

55. Piper Æquale. Leaves elliptic-lanceolate, veined, attenuated, equal at the base, smooth; branches even, knee-jointed.—Found in the island of Montserrat.

56. Piper Præmorsum. Leaves lanceolate, elliptic, attenuated, smooth, shorter on one side at the base; spikes recurved at top.—Native of Surinam.

57. Piper Obovatum. Leaves in threes, petioled, obovate, emarginate, smooth; stem creeping; branches diffused, rooting, smooth, the size of a small packthread, alternate, except that sometimes the lowest are opposite, brown. It is suspected to be only a variety.—Found in the island of Montserrat.

58. Piper Microstachyum. Leaves oblong, acuminate, equal at the base, veined underneath; spikes very short, mucronate; stem branched; branches dichotomous, round, striated above.—Found in Cayenne.

59. Piper Grande. Leaves ovate-oblong, acuminate, many-nerved, equal at the base and petioles; branches striated, smooth, the thickness of a goose-quill; joints knobbed; internodes three or four inches long; flowers very minute.

60. Piper Scabrum. Leaves broad, ovate acuminate, oblique, wrinkled, rugged; spikes erect. This is a shrub, five or six feet high; stem upright, round, somewhat rugged.—Native of the mountains in the most temperate parts of Jamaica.

Piperidge Tree. See *Berberis*.

Piscidia; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-toothed; the upper teeth nearer. *Corolla:* papilionaceous; banner ascending, emarginate; wings the length of the banner; keel crescent-shaped, ascending. *Stamina:* filamenta ten, uniting in a sheath, cloven above; antheræ oblong, incumbent. *Pistil:* germen pedicelled, compressed, linear; style filiform, ascending; stigma acute. *Pericarp:* legume pedicelled, linear, with four longitudinal membranaceous angles, one-celled, separated by double isthmuses. *Seeds:* few, nearly subcylindric. Essential Character. *Stigma:* acute. *Legume:* winged four ways.—The species are,

1. Piscidia Erythrina; *Jamaica Dogwood Tree.* Leaves pinnate; leaflets ovate. It rises with a stem to the height of twenty-five feet or more, almost as large as a man's body, covered with a light-coloured smooth bark, and sending out several branches without order at the top. Flowers of a dirty white colour, succeeded by oblong pods, which have four longitudinal wings, and are jointed between the cells.—It is a native of Jamaica, by road sides, on dry chalky hills. It flowers about May or June, and throws out all its blossoms before the appearance of the foliage, but the leaves appear soon afterwards. The bark of the root is used for the same purpose as the leaves and branches of the Surinam poison. It is pounded, and mixed with the water in some deep and convenient part of a river or creek, whence it may spread itself; and in a few minutes the fish float on the surface as if they were dead: most of the larger recover after a time, but the smaller fry are destroyed. The eel is not intoxicated with common doses, though it is affected very sensibly; for the moment the particles spread where it lies, it moves off with great agility. Jacquin observes, that this quality of intoxicating fish is found in many other American plants. This is generally considered at Jamaica as one of the best timber trees in the island; the wood is very hard and resinous, and is of a light brown colour, coarse, cross-grained, and heavy. It makes excellent piles for wharfs, and the stakes soon form a good live fence. The bark of the trunk is very restringent; a decoction of it stops the immoderate discharge of ulcers, especially when it is combined with the Mangrove bark; it cures the mange in dogs; and would probably answer well for tanning leather.—Both it and the next species are equally propagated by seeds, when they can be obtained fresh from the countries where they naturally grow, for they rarely flower in Europe. The seeds must be sown upon a good hot-bed in the spring, and when the plants come up, and are fit to transplant, they should be each planted in a small pot, filled with light earth, and plunged into a hot-bed of tanner's bark, and afterwards treated in the same way as the other tender exotics of the same kind.

2. Piscidia Carthaginensis. Leaflets obovate. It differs from the preceding, in being double the size in all its parts.—Native of the West Indies.

Pisonia; a genus of the class Polygamia, order Dicœcia; or, according to Swartz, of the class Heptandria, order Monogynia.—Generic Character. *Male. Calix:* scarcely any. *Corolla:* one-petalled, bell-shaped, five-cleft; segments, acute, patulous. *Stamina:* filamenta five, six, or seven, awl-shaped; antheræ roundish, twin. *Pistil:* germen oblong; style short; stigma pencil-shaped. *Female. Calix* and *Corolla,* as in the male. *Pistil:* germen oblong; style simple, cylindrical, longer than the corolla, erect; stigmas bifid. *Pericarp:* berry oval, often five-cornered, valveless, one-celled. *Seed:* single, smooth, oblong. Essential Character. *Calix:* scarcely any. *Corolla:* bell-shaped, or, as Gærtner says, funnel-shaped. *Stamina:* five or six. *Pistil:* one. *Capsule:* superior, one-celled, valveless; berry one-seeded. *Male* and *Female* on the same, or on different plants.—The species are,

1. Pisonia Aculeata; *Prickly Pisonia.* Spines axillary, spreading very much; leaves ovate-acute at each end, smooth; calix of the fruit prickly. The male plants differ so much in appearance from the female, that those who have not seen them rise from the same seeds, would suppose they were different species. Jacquin describes it as an inelegant tree, with round reclining branches, wanting support. He observed many plants of this species about Kingston in Jamaica, where they are abundant, and always traced the hermaphrodite and female flowers to different individuals. Browne declares, that the flowers are very various; being sometimes hermaphrodite on every branch, sometimes male in one branch and female in another, and sometimes male, female, and hermaphrodite, on the different parts of the same plant; but most commonly they are all of one kind. It is a strong withy climber, the main trunk being sometimes no less than five or six inches in diameter; but this is generally in the woods, where it is supported by the neighbouring trees. It is cut for hoops, when there is a scarcity of other wood. In Jamaica, they call it *Cockspur,* or *Fingrigo.* It is very common in the savannas and other low parts of that island, as also in several others, where it is very troublesome to whoever passes through the places of their growth, fastening itself by its strong crooked thorns to the clothes; and the seeds being glutinous and burry, also fasten themselves to whatever touches them; so that the wings of the ground doves and other birds, are often so loaded with the seeds as to prevent their flying, through which they become an easy prey.—It is preserved for curiosity in European gardens, where it is propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a hot-bed of tanner's bark; and when the plants come up, they should be transplanted into separate pots, and plunged into the hot-bed again, where they may remain till Michaelmas; when they should be removed into the stove, plunged into the bark-bed, and treated in the same manner as has been directed for tender plants from the same country; observing to give them plenty of water in hot weather, but only a small quantity in winter. They are too tender to thrive in the open air of this country at any season of the year, and should be constantly kept in the bark-stove. They retain their leaves most part of the year in England.

2. Pisonia Subcordata. Unarmed: leaves cordate, roundish; fruits dry, subclavate, five-cornered; angles muricate at the tip.—Native of Antigua, &c.

3. Pisonia Nigricans. Unarmed: leaves ovate-acuminate; flowers cymed, erect; calix of the fruit pulpy, smooth. It is a small tree, without thorns, upright, twelve, and sometimes twenty feet in height, with a trunk five inches in diameter; when it grows in thick coppices, it acquires an inelegant habit, not much unlike the first species. The berry is soft, black, containing a whitish pulp, which is often wanting, being probably eaten by insects, for it is always found in the unripe fruit.—Native of Jamaica.

4. Pisonia Coccinea. Unarmed: leaves lanceolate-ovate; peduncles terminating, loose; flowers nodding; fruits berried.—Native of Hispaniola.

5. Pisonia Grandis; *Superb Pisonia.* Stem arboreous; leaves oblong, pointed, smooth; cymes compound; flowers polygamous; stamens from seven to nine; calix of the fruit prickly.—Found by Brown in the tropical part of New Holland.

Pistacia; a genus of the class Dicœcia, order Pentandria. —Generic Character. *Male. Calix:* ament loose, scattered, composed of small one-flowered scalelets; perianth proper, five-cleft, very small. *Corolla:* none. *Stamina:* filamenta five, very small; antheræ ovate, four-cornered, erect, patulous, large. *Female* on a separate plant. *Calix:* ament none; perianth trifid, very small. *Corolla:* none. *Pistil:* germen ovate, larger than the calix; styles three, reflex; stigmas thickish, hispid. *Pericarp:* drupe dry, ovate. *Seed:* nut ovate, smooth. Essential Character. *Male:* an ament. *Calix:* five-cleft. *Corolla:* none. *Female:* distinct. *Calix:* trifid. *Corolla:* none. *Styles:* two. *Drupe:* one-seeded.——The species are,

1. Pistacia Officinarum; *Pistachia Tree,* or *Pistachia-nut Tree.* Leaves simply ternate and pinnate; leaflets oval. In the Levant it grows to the height of twenty-five or thirty feet; the bark of the stem and old branches is of a dark russet colour, but that of the young branches is of a light brown. The male puts forth its flowers first; and some gardeners pluck them whilst yet shut, dry them, and afterwards sprinkle the pollen over the female tree: but the method usually followed in Sicily, when the trees are far asunder, is to wait till the female buds are open, and then to gather bunches of male blossoms ready to blow; these are stuck into a pot of moist mould, and hung upon the female tree, till they are quite dry and empty.—Native of Persia, Arabia, Syria, and India.—It is propagated by the nuts, which are obtained from abroad, and planted in the spring, in pots filled with light kitchen-garden earth, and plunged into a moderate hot-bed: when the plants appear, admit a large share of air to them, to prevent their drawing up weak; and by degrees harden them to bear the open air, to which expose them from the beginning of June till autumn, when they should be placed under a hot-bed frame to screen them from the frost in winter; for while they are young they are too tender to live through the winter in England without protection, but they should always be exposed to the air in mild weather. These plants shed their leaves in autumn, and therefore should not have much wet in winter; and in the spring, before the plants begin to shoot, they must be transplanted each into a separate small pot; and if they be plunged into a very moderate hot-bed, it will forward their putting out new roots; but as soon as they begin to shoot they must be gradually hardened, and placed abroad again: they may be kept in pots three or four years till they have got strength, during which time they should be sheltered in winter; and afterwards they may be turned out of the pots, and planted in the full ground, some against high walls to a warm aspect, and others in a sheltered situation, where they will bear the cold of our ordinary winters very well, but in severe frosts they are often destroyed. The trees flower and produce fruit in England, but our summers are not sufficiently warm to ripen the nuts.

2. Pistacia Narbonensis. Leaves pinnate and ternate, suborbiculate.—Native of Mesopotamia and Armenia.

3. Pistacia Vera. Leaves unequally pinnate; leaflets subovate, recurved.—This, as well as the second species, is probably a mere variety of the first, and of course a native of the same countries.

4. Pistacia Terebinthus; *Common Turpentine Tree.* Leaves unequally pinnate; leaflets ovate, lanceolate. It is a low thick shrub, the trunk and branches rugged, and bent in all directions. The flowers form branching catkins at the axils of the leaves, and are reddish; the wood is odorous and balsamic. The Cyprus or Chian turpentine, which this tree furnishes, is procured by wounding the bark of the trunk in several places, during the month of July, leaving a space of about three inches between the wounds; from these the turpentine is received on stones, upon which it becomes so much condensed by the coldness of the night, as to admit of being scraped off with a knife, which is always done before sun-rise. In order to free it from all extraneous admixture, it is again liquefied by the sun's heat, and passed through a strainer, after which it is fit for use. The quantity produced is very inconsiderable; four large trees, sixty years old, only yielding two pounds nine ounces and six drachms: but in the eastern parts of Cyprus and Chio the trees afford somewhat more, though still so little as to render it very costly; and on this account it is commonly adulterated, especially with other turpentines. The best Chio turpentine is generally about the consistence of thick honey, very tenacious, clear, and almost transparent, white inclining to yellow, and of a fragrant smell; moderately warm to the taste, but free from acrimony and bitterness. For the medicinal qualities of turpentine, see *Pinus Larix.*—This tree is as hardy as the first species, and may be treated in the same manner: it has often survived very severe winters.

5. Pistacia Atlantica. Leaves deciduous, unequally pinnate; leaflets lanceolate, somewhat waved, petioled, winged. This is a large tree, with a thick, wide, roundish head. From the bark of the trunk and branches, at different seasons of the year, but especially in summer, there flows a resinous juice which hardens in the air, and is of a pale yellow colour, an aromatic smell, and a taste that is not unpleasant. This is scarcely to be distinguished from the Oriental Mastich, and is known by the same name among the Moors. It is inspissated into lamellæ round the branchlets, or into irregular globules, differing in thickness and shape, frequently as big as the end of the finger or thumb, some of which drop from the tree, and are found scattered on the ground. The Arabs collect this substance in autumn and winter, and make the same use of it as of the Mastich from Scio, chewing it to give a pleasant smell to the mouth, and brightness to the teeth. At the foot of Mount Atlas, this is the largest tree which grows there; but the resinous juice is softer, and of a much less pleasant smell and taste, than that which flows from the trees of the desert, which is probably occasioned by the climate being cooler, and the soil more moist and fertile. The leaves have frequently round red galls on them, resembling berries. The Moors eat the drupes, and bruise them to mix with their dates.—Native of Barbary, at the foot of mountains.

6. Pistacia Lentiscus; *Mastich Tree.* Leaves abruptly pinnate; leaflets lanceolate. It rises to the height of eighteen or twenty feet, the trunk being covered with a grey bark, sending out many branches, which have a reddish brown bark. The male flowers come out in loose clusters from the sides of the branches, are of an herbaceous colour, appear in May, and soon fall: they are generally on different plants from the fruits, which also grow in clusters, and are small berries of a black colour when ripe.—It is a native of the south of Europe and the Levant. Desfontaines informs us that it is very common in Barbary, both wild on the hills and cultivated in gardens; but that it is little, if at all, resinous, though the branches and trunk were wounded at different seasons of the year; that the wood, however, yields an aromatic smell in burning; and that the berries yield an oil fit both for the lamp and the table. In the island of Chio the officinal Mastich is obtained most abundantly by making transverse incisions into the bark of the tree, whence the mastich exudes in drops, which are suffered to run down to the ground, and after they are concreted they are collected for use. The incisions are made at the beginning of August;

when the weather is very dry, and are continued till the end of September. Mastich is a resinous substance, imported into England in small, yellowish, transparent, brittle grains or tears; it has a light agreeable smell, especially when rubbed or heated: on being chewed, it first crumbles, soon after sticks together, and becomes soft and white like wax, without impressing any considerable taste. It totally dissolves, except the earthy impurities, which are commonly in no great quantity, in rectified spirit of wine, and then discovers a degree of warmth and bitterness, and a stronger smell than that of the resin in substance. Boiled in water, it impregnates the liquor with its smell, but gives out little or nothing of its substance: distilled with water, it yields a small quantity of a limpid essential oil, in smell very fragrant, in taste moderately pungent. Rectified spirit brings over also in distillation the more volatile odorous matter of the mastich. It is a common practice with the Turkish women to chew this resin, especially in the morning, not only to render their breath more agreeable, but to whiten the teeth, and strengthen the gums; they also mix it with their fragrant waters, and burn it with other odoriferous substances in the way of fumigations. European japanners also employ it in some of their varnishes. As a medicine, it is thought to be a mild corroborant and astringent; and, as possessing a balsamic power, it has been recommended in hæmoptysis proceeding from ulceration, fluor albus, debility of the stomach, and in diarrhœas and internal ulcers. Chewing it has been also said to be of use in pains of the teeth and gums, and in some catarrhal complaints. —There is a variety called the Narrow-leaved Mastich Tree, which rises to the same height, but differs in having a pair or two of leaflets more to each leaf, which is much narrower, and of a paler colour. Native of the country about Marseilles, and some other places in the south of Europe.— The plants of this species are generally propagated by laying down their young branches, which, if properly managed, will put out roots in one year, and may then be cut off from the old plants, and each transplanted into separate small pots. These must be sheltered in winter, and placed abroad in a sheltered situation, and treated in the same way as other hardy green-house plants. It may also be raised by seeds in the same way as the others; but if the seeds be not taken from trees growing in the neighbourhood of the male, they will not grow; and if they are kept out of the ground till spring, the plants rarely appear till the spring following. When these plants have obtained strength, some of them may be turned out of the pots, and planted against warm walls, where, if their branches be trained against the walls, they will endure ordinary winters very well, and may be preserved with a little shelter when the winters are severe.

Pistia; a genus of the class Monadelphia, order Octandria.—Generic Character. *Calix*: none. *Corolla*: one-petalled, unequal, erect, permanent; tube short, closely embracing the germen; border cordate, roundish, widened, acuminate, entire, contracted in the middle on both sides by a lateral plait bent inwards. *Stamina:* filamentum round, thick, blunt, springing almost perpendicularly from the centre of the border of the corolla, hanging over the pistil, surrounded at the base by a membranaceous disk, and augmented below on both sides by a fringe hanging down, the width of the antheræ; antheræ six to eight, globular, placed in a ring round the margin of the filamentum at the top; (Swartz says, three to eight, and generally three only.) *Pistil:* germen subovate, twice as long as the tube of the corolla, fastened to the back of the petal by a longitudinal thickened line, extending to the very origin of the filamentum; style thick, erect, shorter than the filamentum; stigma blunt, subpeltate. *Pericarp*: capsule ovate, compressed, one-celled. *Seeds*: very many, oblong, depressed at the top, and there umbilicated with a dot, inserted horizontally to the back of the capsule, where it adheres to the corolla. *Observe.* This plant was placed by Linneus in the class Gynandria; but Swartz, after Jacquin, has placed it better in that of Monadelphia. Essential Character. *Calix:* none. *Corolla:* one-petalled, tongue-shaped, entire. *Antheræ:* six or eight, placed on the filamentum. *Style:* one. *Capsule:* one-celled, at the bottom of the corolla.—The species are,

1. Pistia Stratiotes. This is a stemless floating elegant plant; roots many, a foot and half long, putting forth simple fibres from their circumference, an inch and half in length. Leaves various in number and size, according to the age of the plant, (while it is in vigour, about twenty,) spreading out in a circle or like a rose, a foot in diameter: they are obovate, attenuated at the base, for the most part quite entire, sometimes emarginate, sessile, patulous, lanuginose at the base between the nerves, and on the upper surface villose, thick, spongy, a little succulent, and therefore well adapted for floating; but on the back, from a thicker, very large, and subovate area, they push forth ascending, very thick, and extremely prominent nerves. Flowers whitish, inodorous, axillary, solitary, and erect, on a short peduncle. Adanson, in his *History of Senegal*, asserts that the primary root is fixed strongly into the bank. Jacquin did not attend to this circumstance, but remarks, that in taking the plants out of the water, he never found any resistance; though he does suggest that the young plant may be fixed at first, and afterwards break loose.—Native of Asia, Africa, South America, and the West Indian Islands, in stagnant waters and quiet streams; flowering in April.

2. Pistia Spathulata. Leaves upon the petiole, abruptly angustated, dilatated above, rotund-obtuse; flowers white, axillary.—Grows in Carolina.

Pisum; a genus of the class Diadelphia, order Decandria. —Generic Character. *Calix:* perianth one-leafed, five-cleft, acute, permanent; the two upper segments broadest. *Corolla:* papilionaceous; standard very broad, obcordate, reflex, emarginate with a point; wings two, roundish, converging, shorter than the standard; keel compressed, semilunar, shorter than the wings. *Stamina:* filamenta in two distinct sets; one simple, superior, flat, awl-shaped; and nine awl-shaped, below the middle united into a cylinder, which is cloven at top; antheræ roundish. *Pistil:* germen oblong, compressed; style ascending, triangular, membranaceous, keeled, with the sides bent outwards; stigma growing to the upper angle, oblong, villose. *Pericarp:* legume large, long, roundish, or compressed downwards, with the top acuminate upwards, one-celled, two-valved. *Seeds:* several, globular. Essential Character. *Style:* triangular, above keeled, pubescent. *Calix:* has the two upper segments broadest.——The species are,

1. Pisum Sativum; *Common Pea.* Petioles round; stipules rounded at bottom, and crenate; peduncles many-flowered. Root annual, slender, fibrous; stems hollow whilst young, brittle, branched, smooth, weak, climbing by terminating tendrils; leaves abruptly pinnate, composed usually of two pairs of leaflets, which are oval and smooth; corolla white, greenish white, purple, or variegated; legumes commonly in pairs, about two inches long, of an oblong form, smooth, swelling at the straight suture where the seeds are fastened, flatted next the other suture, which arches, especially towards the end; seeds from five or six to eight or nine, commonly globular, but in some varieties irregular, or approaching to a cubic form, smooth, white, yellow, blue,

gray, brown, or greenish, with a small oblong umbilicus. The colour of the whole plant is glaucous or hoary green, from a white meal which covers it.—It is said to be a native of the south of Europe. Loureiro informs us that it is found in China and Cochin-china, but not frequently, and that it does not appear to be indigenous, though, according to Thunberg, it is cultivated in most provinces of Japan. The following are the principal varieties of Garden Peas, arranged in the order of time in which they are gathered for the table: 1. The Golden Hotspur. 2. The Charlton. 3. The Reading Hotspur. 4. Master's Hotspur. 5. Essex Hotspur. 6. The Dwarf Pea. 7. The Sugar Pea. 8. Spanish Morotto. 9. Nonpareil. 10. Sugar Dwarf. 11. Sickle Pea. 12. Marrowfat. 13. Dwarf Marrowfat. 14. Rose or Crown Pea. 15. Rouncival Pea. 16. Gray Pea. 17. Pig Pea. The *Hotspurs*, like the *Hastings* enumerated by Parkinson, have their names from their coming to bear early in the season. The six first varieties are of this nature, and being low-growers, require sticks only three or four feet high; and the Dwarf Pea not so much. New varieties of these are raised almost every year, which, because they differ in some slight particular, are sold at an advanced price; but these are not permanent, and without the greatest care will soon degenerate. The Sugar and Crown Peas agree in the remarkable property of having no hard rigid lining to the legume, so that their pods may be boiled and eaten entire; they have a sweet and agreeable flavour. Besides the above, we have the *early* Charlton Hotspur, the *early* Golden Hotspur. *Nicholson's earliest* Hotspur, &c. Of the larger Peas, from No. 1 to 13 and 15, there are also several varieties; as, the Large and Dwarf Marrowfat; the Large and Dwarf Sugar Pea; the Green and White Rouncival Pea, &c. They all grow tall, and require sticks from five to six, and even seven or eight feet high. Besides the Common Rose or Crown Pea, there is a variegated one, the Egg Pea; the Cluster Pea; the Large Gray Pea; the Crooked Gray Pea; and innumerable others, of those which are used in field culture. Mr. Miller has a perennial Pea, which he calls Pisum Americanum, or *Cape Horn Pea*, from its having been brought by lord Anson's cook when he passed that cape, where this Pea was a great relief to the sailors; but it is not so good for eating as the worst sort cultivated in England. It is a low trailing plant; there are two leaflets on each footstalk, those below spear-shaped, and sharply indented on their edges, but the upper ones small and arrow-pointed: the flowers are blue, each peduncle sustaining four or five of them; legumes taper, nearly three inches long; seeds round, about the size of Tares.—*Propagation and Culture.* It is a common practice with the gardeners in the neighbourhood of London, to raise Peas upon hot-beds, to have them very early in the spring; in order to which they sow their Peas upon warm borders under walls or hedges, about the middle of October; and when the plants come up, they draw the earth up gently to their stems with a hoe, the better to protect them from frost. In these places they let them remain till the latter end of January or the beginning of February, if they be preserved from frost, observing to earth them up from time to time as the plants advance in height, as also to cover them in very hard frosts with pease-haulm, straw, or some other light covering, to preserve them from being destroyed. Then, at the time before-mentioned, they make a hot-bed, in proportion to the quantity of Peas intended. This bed must be made of good hot dung, well prepared, and properly mixed together, that the heat may not be too great. The dung should be laid about three feet thick, or somewhat more, according as the beds are made earlier or later in the season; when the dung is equally levelled, then the earth, which should be light and fresh, but not over-rich, must be laid on about six or eight inches thick, laying it equally all over the bed. This being done, the frames, which should be two or two feet and a half high on the back part, and about eighteen inches in front, must be put on, and covered with glasses: after which it should remain three or four days to let the steam of the bed pass off, before you put the plants therein, observing every day to raise the glasses to give vent for the rising steam to pass off; then, when you find the bed of a moderate temperature for heat, take up the plants with a trowel or some other instrument, as carefully as possible, to preserve the earth to the roots, and plant them into the hot-bed, in rows about two feet asunder; and the plants should be set about an inch distant from each other in the rows, observing to water and shade them until they have taken root; after which you must be careful to give them air at all times when the season is favourable, otherwise they will draw up very weak, and be subject to grow mouldy, and decay. You should also draw the earth up to the shanks of the plants as they advance in height, and keep them always clear from weeds. Water should be sparingly given, for if too much watered they grow rank, and sometimes rot off at their shanks just above ground. When the sun shines hot, cover the glasses with mats, otherwise their leaves will flag, and their blossoms fall off, without producing pods; as will also keeping the glasses too close at that season. But when the plants begin to fruit, they should be watered oftener, and in greater plenty than before, for by that time they will have nearly done growing, and the often refreshing them will occasion their producing a greater plenty of fruit. The sort of Pea which is generally used for this purpose is the Dwarf, for all the other sorts ramble too much to be kept in frames: the reason for sowing them in the common ground, and afterwards transplanting them on a hot-bed, is also to check their growth, and cause them to bear in less compass; for if the seeds were sown upon a hot-bed, and the plants continued thereon, they would produce such luxuriant plants as are not to be contained in the frames, and would bear but little fruit.—Another method is, to sow them under a south wall at the end of September. Put them very near the wall; and when they peep out of the ground, cover them with earth as they advance, about an inch thick: in frost protect them with pease-haulm, wheat-straw, or dry fern. About the end of January, if the winter has been mild, the Peas will be some inches above ground; then make a hot-bed in the manner directed for Cucumbers, except that the dung must be only two feet thick. Let the bed be four feet broad, and cover it with ten inches of light virgin earth. The frames should be two feet high in the back, sloping to fifteen inches in front. Having put these on the hot-bed, tilt up the glasses daily, that the steam may pass off, and when the bed is become of a moderate temperature, take up the Peas with a ball of earth to their roots, and plant them fourteen inches row from row, and four inches plant from plant. Water them moderately at planting, but afterwards sparingly. Shade the beds from eleven until the sun is nearly off; and at the same time give them air in mild weather. Cover the dung which surrounds the frames with earth, that when the glasses are tilted up to give air, the Peas may not be blighted with the rancid steam of the dung. Dwarf Peas, and some of the early Hotspurs, may also be sown in pots in September, sinking the pots in the common earth; and when frost sets strong in, the pots may be set under cover in a green-house or glass-case. Make a border in front of the green-house, of good fresh earth; and about the beginning of December take

the Peas out of the pots, and plant them in the borders in rows at three feet distance, and ten inches asunder in the rows, watering them gently. Give them air, and draw the earth up to their roots. Let them have a good portion of water while in bloom: and a crop of Peas will be thus obtained as early as the beginning of March.—The next sort of Pea which is sown to succeed those on the hot-bed, is the Hotspur, of which there are reckoned three or four sorts; as the Golden Hotspur, the Charlton Hotspur, the Master's Hotspur, the Reading Hotspur, and some others, which differ little from each other except in their early bearing, for which the Golden and Charlton Hotspurs are chiefly preferred. If, however, any of these be cultivated in the same place for three or four years, they are apt to degenerate, and to be later in spring fruiting, for which reasons most curious persons procure their seeds annually from some distant place; and in the choice of these seeds, if they could be obtained, from a colder situation and a poorer soil than that in which they are to be sown, it will be much better than on the contrary, and they will come earlier in the spring. These must also be sown on warm borders towards the latter end of October. When the plants appear, draw the earth up to their shanks in the manner before directed, which should be continued as they advance in height, always observing to do it when the ground is dry. This will greatly protect the stems of the plants against frost; and if the winter should prove very severe, it will be of great service to cover the plants with peas-haulm or some other light covering, as before directed. This covering should be taken off in mild weather, and only suffered to remain on during the continuance of the frost; for they are kept too close, they will be drawn very weak and tender, and be liable to be destroyed with the least inclemency of the season. In the spring you must carefully clear them from weeds, and draw some fresh earth up to their stems; but do not raise it too high to the plants, lest by burying their leaves you should rot their stems, as is sometimes the case, especially in wet seasons. Take care to keep them clear from vermin, which, if permitted to remain among the plants, will increase so plentifully as to devour the greatest part of them. The principal vermin that infest them are slugs, which lie all the day in the small hollows of the earth, near the stems of the plants, and in the night-time come out, and make great havoc. They chiefly abound in wet soils, or where a garden is neglected, and over-run with weeds. The best way is to make the ground clear all round the Peas; this will destroy their harbours; and afterwards in a fine mild morning very early, when these vermin are got abroad from their holes, slack a quantity of lime, which should be sown hot and thick upon the ground, and it will destroy the slugs without doing any, or very little, injury to the Peas, if it be not too thickly scattered. If this crop of Peas succeed, it will immediately follow those on the hot-bed; but for fear this should miscarry, it will be proper to sow two more crops at about a fortnight's distance from each other, so that there may be the more chances to succeed. This will be sufficient until the spring of the year, when you may sow three or four more crops of these Peas: one towards the beginning of January, the other in the middle, and the last at the end of the same month.—These two late sowings will be sufficient to continue the early sort of Peas through the first season, and after this it will be proper to have some of the large sort of Peas to succeed them for the use of the family. On this account it will be well to sow some of the Spanish Morotto, which is a great bearer, and a hardy sort of Pea, about the middle of February, upon a clear open spot of ground. These must be sown in rows about three feet asunder, and the Peas should be dropped in the drills about an inch distance, covering them about two inches deep with earth; and taking care that none of them lie uncovered, as that would attract mice, rooks, and pigeons, to plunder the whole spot; and through this neglect it often happens, that a whole plantation is devoured by these marauders, who could not find them out so easily when they are not left in sight. About a fortnight afterwards, sow another spot with any large sort of Pea, to succeed those, and then continue to repeat sowing once a fortnight till the middle or latter end of May, some of these kinds; only observing to allow the Marrowfats, and other very large sorts of Peas, at least three feet and a half, or four feet, between row and row; and the Rose Pea should be allowed at least eight or ten inches' distance from plant to plant in the rows, for they grow very large; and if they have not room allowed them, they will spoil each other by drawing up very tall, and will produce no fruit. When these plants come up, the earth should be drawn up to their shanks, as before directed, and the ground kept entirely clear from weeds; and when the plants are grown eight or ten inches high, you should stick some rough burrows of brush-wood into the ground, close to the Peas, for them to ramp upon, which will support them from trailing upon the ground, which is very apt to rot the large-growing sorts of Peas, especially in wet seasons; besides, by thus supporting them the air can freely pass between them, which will preserve the blossoms from falling off before their time, and occasion them to bear much better than if permitted to lie upon the ground, and there will be room to pass between the rows to gather the Peas when they are ripe. The Dwarf sorts of Peas may be sown much closer together than those before-mentioned, for these seldom rise above a foot high, and rarely spread above half a foot in width, so that these need not have more room than two feet row from row, and not above an inch asunder in the rows. These produce a good quantity of Peas, provided the season be not over dry; but they seldom continue long in bearing, so that they are not so proper to sow for the main crop, when a quantity of Peas is expected for the table, their chief excellency being for hot-beds, where they will produce a greater quantity of Peas, provided they are well managed, than if exposed to the open air, where the heat or the sun soon dries them up. The Sickle Pea is much more common in Holland than in England, it being the sort mostly cultivated in that country; but in England they are only cultivated by curious gentlemen for their own tables, and are rarely brought to market. The birds are very fond of this sort, and, if not prevented, would often destroy the whole crop. It should be planted in rows about two feet and a half asunder, and should be managed as has been directed for the other sorts.—Although it has been recommended to sow the large sorts of Peas for the main crop, they certainly are not so sweet as the early Hotspur Peas, a succession of which ought also to be continued through the season, in small quantities, to supply the best tables. This may be done by sowing some every week or ten days; but all those which are sown late in the season should have a strong moist soil, for in hot light land they will run up, and come to nothing. The large-growing sorts may be cultivated for the common use of the family, because they will produce in greater quantities than the other, and will also endure the drought better, but the early kinds are by far the sweetest-tasted Peas. The best of all the large kinds is the Marrowfat, which, if gathered young, is a well-tasted Pea; and this will continue good through the month of August, if planted on a strong soil. In the open ground, it is better to sow two rows of Peas close

together, or within ten inches or a foot of each other, leaving between each pair of those close rows an interstice of two feet for the Dwarf Peas, or of three feet for the early climbers, and three feet and a half or four feet for the larger sorts. The reason of this is, that the stakes or bushes being placed between two close rows, will support both; whereas in the common way of sowing Peas, every row must have a row of bushes. Gardeners who vie with one another for the earliest Peas, never stake them, alleging that it gives them liberty to grow too much to the haulm, and that the early fruit will thereby be prevented from ripening too soon. This may be the case in sandy soils; but in strong lands, if the Peas, especially the larger sorts, are not supported, they will infallibly rot before they can be fit for the table.—*Field Culture.* Peas are cultivated by the farmer either alone or with Beans. In strong lands the Bean is the predominant crop; in lighter lands, the Pea. In such lands the Pea is more frequently sown alone. The sorts commonly sown in fields are the Gray, the Blue, and the White. Of these there are innumerable transient varieties in our different counties. In Suffolk, where the culture of the Pea is well understood, they reckon, 1. The Common White. 2. The Forty-day. 3. The Charlton. 4. The Blue. 5. The Large Gray. 6. The Small Gray. 7. The Speckled. 8. The Large Dutch. 9. The Dun. The Gray, and other large winter Peas, are seldom cultivated in gardens, because they require a great deal of room, but are usually sown in fields in most parts of England. The best time for sowing these is about the beginning of March, when the weather is pretty dry, for if they be put into the ground in a very wet season, they are apt to rot, especially if the ground be cold; these should be at least allowed three or four feet from row to row, and must be sown very thin in the rows; for if they are sown too thick, the haulm will spread so as to fall to the ground, and ramble over each other, which will cause the plants to rot, and prevent their bearing. They will bear being sown in autumn; and it is a common practice in Herefordshire to begin Pea-sowing as soon as the wheat-seed is over. The Peas which are sown in autumn, or before Christmas, are late sorts, and therefore are not proper where the crop is to be harvested time enough for Turnips. The best method to sow these Peas is, to draw a drill with a hoe two inches deep by a line. Having scattered the seeds in it, to draw the earth over them with a rake. This is a quick method for gardens; but where they are sown in fields, they commonly make a shallow furrow, with the plough, and harrow in the seeds. Where labour is dear, it is a great expense to weed and earth up the plants by hand-hoeing; but it may be easily effected by a horse-hoe, which will not only kill the weeds, but by stirring the soil render it mellow, greatly promote the growth of the plants, and render the ground fitter to receive another crop the following season. The Gray Peas thrive best on a strong clayey land; these are commonly sown under-furrow; but by this method they are always too thick, and do not come up regularly; they therefore should also be sown in drills. Being much hardier than the former sorts, these may be sown towards the end of February. The Common White Pea will do best on light sandy land, or on a loose rich soil. The usual method of sowing these Peas, is with a broad-cast, and to harrow them in: but it is a much better way to sow them in drills about three feet asunder; for less than half the quantity of seed will do for an acre, and the ground may be hoed, both to destroy the weeds, and earth up the Peas. The usual time for sowing these Peas is the middle of March or the beginning of April, on warm land; but on cold ground they should be sown a fortnight or three weeks later. In the common way of sowing they allow three bushels or more to an acre; but if they be drilled, a bushel and a half will be sufficient. The Green and Maple Rouncivals require a stronger soil than the white, and should be sown a little later in the spring; the drills also should be at a greater distance, as two feet and a half or three feet, for this sort is apt to grow rank, especially in a wet season. The ground between the rows should be hoed two or three times. The Forty-day, or the Charlton Pea, should be sown early in March; and if Turnips are intended, not later than that month: late-sown crops are subject to the green fly or dolphin; and to avoid that, it is recommended to sow in February. If Peas are not intended as a preparation for Turnips, many sow before Christmas, but this must be on dry land, and in a dry time; for if they are sown after rain or snow, the crop will suffer. By sowing the Charlton Pea early in March, the crop will be cleared in June, or the first week in July, which is a good season for Turnips, and on all dry soils ought never to be neglected. If the harvest happens to be later, the wads should be laid in rows, and the plough sent in, by which a week, or perhaps ten days, may be gained. The advantages of this practice must be obvious, when it is considered that a thick smothering crop of Peas not only chokes weeds, but improves the soil, particularly in leaving the surface loose and friable, from the putrefactive fermentation carried on under the crop, by retaining the moisture, and excluding the sun; and if the land be ploughed directly, which is a great point, though much neglected, proves a fine preparation for Turnips: the Peas are not the only gain, but the saving in tillage; for by this means the latter crop is put in upon one ploughing only, which can be effected no other way. Less than three bushels to an acre ought not to be sown broad-cast. One great object, perhaps the greatest, in this crop is, to procure a thick cover over the soil, to destroy weeds, and breed a moist fermentation on the surface, which a thin crop cannot produce. If the produce only be regarded, and the hoes are designed to be perpetually at work, two bushels, and even less, are enough: some sow four, but that is evidently too much. A common method in Suffolk is to put Peas on a lay with only one ploughing; the seed to be pricked in with iron dibbles. This method succeeds well, but it should be practised only on loams and good sand: very poor sand will not do for Peas; and on clay Beans answer far better. When the crop is put on a stubble, the land should be ploughed in autumn, and, if the season requires it, twice in the spring; but one ploughing, judiciously timed, may do better than two. The seed may be either ploughed or harrowed in; if the former, it must be above three inches deep, but harrowing in is safer, if the harrows let them in two inches; but in this case they must be watched against rooks and pigeons. When Peas are planted by hand on a turf once ploughed, it is called dibbling. A man walking backwards, that he may not tread on the holes, strikes a dibble that makes two holes, sometimes three, on a nine-inch furrow, and is followed by boys, who drop a pea in every hole. These operations are both performed in Suffolk, for eight shillings an acre. They are covered by a bush-harrow; and the peas come up about four inches every way, and, being so close, neither want nor admit of hoeing. Seven pecks, or two bushels, of seed, sow an acre. Drilling is used on land in tilth. The rows should be doubled at eighteen inches asunder, and then an interval of two feet; in the hoeing, attention should be given to make the two rows clasp together. Drilled peas should be hand-hoed well while the crop is young, and afterwards in the intervals, taking care

not to tread on the plants. If weeds get up afterwards, they ought not to be meddled with; for the crop will be pulled about, and spoiled in getting them out. Even horse-hoeing should not be ventured on after the plants are near maturity. Some hand-hoe once, and horse-hoe twice or thrice afterwards, as there may be occasion. If broad-cast peas be hoed, it must be whilst they are very young: when they cling together, the hoe does more harm than good; beside, if the land was in good order, and the seed sown thick enough, they would need no hoeing.—Peas when nearly ripe are apt to be devoured by rooks, pigeons, &c. they should therefore be well watched. They are generally cut with a tool called a *peas-make*, which is half an old scythe fixed in a handle, with which they are rolled, as they are cut, into small bundles called *wads*, in other places *wisps*. These should be small, to dry well, and should lie out some days to wither. In some countries they are reaped with a hook, and sometimes mown, but that is an injudicious practice. Of all crops this is the most uncertain, and it is rarely considerable; two quarters and a half on an acre, are about the average produce; now and then four, four and a half, and five quarters, are gained, but probably not once in ten years. The greatest burdens of straw, in crops that perfectly cover the ground, do not yield a very large produce. If a man shades his land well, and gets two and a half, and three quarters, on an acre, he has reason to be satisfied with the produce. When any sorts are intended for seed, there should be as many rows left ungathered, as may be thought necessary to furnish a sufficient quantity; and when the Peas are in flower, they should be carefully looked over, to draw out all the plants which are not of the right sort; for there will be always some roguish plants, as the gardeners term them, which, if left, will cause the others to degenerate. The rest must remain until their pods are changed brown, and begin to split. The plants should then be pulled up and stacked till winter, or else thrashed out as soon as they are dry, and put up in sacks. Let them not remain too long abroad after they are ripe, for wet will rot them; and heat after rain will cause the pods to burst, and eject the seeds. By diligently drawing out bad plants, and marking those which come earliest to flower, the gardeners have greatly improved their peas of late years, and they are constantly endeavouring to procure forwarder varieties. As it is scarcely any object with gentlemen to save their own seed, except in the case of having a particular sort which they cannot purchase; so it is not advisable to continue sowing the same seed longer than two years on the same ground.—The principal use of Peas is to fatten hogs; no other grain agrees better with those animals, especially when they are harvested dry, and ground into meal. Bread made of this meal was formerly much in use in some parts of Scotland; but of late it is said to have been almost wholly given up. It is reported to be mixed with wheat flower by the millers, when Peas are reasonable. The straw, if well harvested, is a very considerable object for fodder; it is little inferior to ordinary Hay, and all sorts of cattle thrive well on it; but it is apt to gripe some horses, if given too soon. It should not be used before January; and when it is found to gripe the animal, a few Turnips, Cabbages, Carrots, or Potatoes, will correct that tendency.—*Culture of Peas in Kent.* The following varieties are commonly cultivated by Kentish Farmers: The Reading and Leadman's Dwarfs, for Splitting Peas, and fattening hogs; the Gray Polt; Nutmeg Gray; Early Dun, called Sutton's Gray in East Kent; and Shepherd's Gray; all which are fattening for hogs. Besides these, many others are cultivated for supplying the London Seedsmen. All are drilled in rows, about eighteen inches apart, from the middle of February to the end of March, and sometimes later. They are hand and horse hoed, and are harvested from the middle of July till the end of September. They are reaped with a hook, called a podware hook. The produce is from one and a half to five quarters on an acre. Leadman's Dwarf, and the Early Gray, are thought to be the most prolific. The Early Charlton is frequently off the ground in time to get a good crop of Turnips.—*Culture in Middlesex.* About three thousand acres are annually cropped with Peas in this county; they are much on the increase, and are cultivated in the most clean and garden-like manner. On upwards of two thousand acres they succeed a clean crop of Beans; in which case the Bean-stubble is ploughed up with a thin furrow about January, and during every dry time till March, and soon afterwards re-ploughed a full depth. The water furrows are kept open, and the land remains in this state till seed-time. Peas sown to be sent green to market, succeed Clover, Corn, or any other crop. In Essex, they frequently follow Potatoes. As long as the land is cleared, and properly prepared, which will generally be accomplished by the middle of November, White Hotspur Peas are planted for podding for the London Market. The land is generally a dry loamy sand, and manure is constantly ploughed in during January and February; after which it is harrowed, and is then fit for the reception of the seed, which is put into drills fifteen inches apart, mostly across, but occasionally along the ridges; and the seed is covered in with the hoe. Some persons bush-harrow the whole. The quantity of seed sown is generally three bushels an acre; such as are intended for podding are put into the ground every week or fortnight, during the months of January, February, and March, for a regular succession of crops to supply the market daily. Gray Peas are sown throughout the month of March. Against the podding season, poor persons from every part of London apply to the farmers who have early Peas. Many of the richer persons sell their Peas by the acre, to persons who employ the podders, and who gather by the sack of four bushels. About forty podders are set to ten acres. Carts are loaded, and sent off, so as to be delivered to the salesmen at market, from three to five o'clock in the morning. In Essex, they are usually sold in the field, at five pounds an acre, reserving the haulm for fodder. The Peas are usually picked twice over, after which, if, from a scarcity of hands, any be left for seed, it is esteemed a loss. When hands are in plenty, the crop is picked clean, the haulm is cut up with hooks, removed on to every fifth ridge, or into a grass field, to dry; it is then put into stacks for horse-feed, and the land is prepared as speedily as possible for Turnips.

2. Pisum Maritimum; *Sea Pea.* Petioles flattish above; stem angular; stipules sagittate; peduncles many-flowered. Root perennial, running far and deep among the stones, or into the sand in every direction; stems short and procumbent, thickly clothed with grayish glaucous leaves, each composed of six or eight oval, entire, generally alternate leaflets, and ending in a divided tendril; flowers rather large, a little drooping; corolla beautifully variegated with red and purple. It is accurately remarked by Dr. Smith, that this species is almost as nearly allied to Lathyrus as to Pisum; both in habit and generic character; and that Pisum Sativum is not more different in external appearance, from the genus of Lathyrus, than Vicia Faba, or the Bean, is from the other Viciæ. These, however, he adds, are matters of opinion; and in so natural a class, it is very difficult to find out certain and obvious marks of distinction. We learn from the epistles of the learned Caius, that the Sea Pea was first observed in the year 1555, when, in a great scarcity, the poor people on

the coast of Suffolk, about Orford and Aldborough, supported themselves with it for some time. This story is retailed by Stow and Camden, with the addition, that they were supposed to spring up opportunely in that year of dearth, from a ship-wrecked vessel laden with Peas; whereas the Sea Pea differs from all the varieties of the garden or field Pea, in the length and continuance of its roots, the smallness and bitterness of its seed, and the whole habit and appearance of the plant. It had probably grown a long time unobserved on Orford beach, till extreme want called it into public notice. The seed is so bitter that it would not be eaten, except in a want of better food, for it is neglected by the very birds: but the legend of its miraculous appearance in a time of scarcity, is still believed by many good people.—It may be propagated by seeds or by the roots, and, though a native of the sea-coast, is easily cultivated in gardens.

3. Pisum Ochrus; *Yellow-flowered Pea.* Petioles decurrent, membranaceous, two-leaved: peduncles one-flowered. Root annual; stalk angular, nearly three feet high; flowers pale yellow, small; pods two inches long, containing five or six roundish seeds, a little compressed on their sides; these may be eaten green, but, unless they are gathered very young, they are coarse, and at best not so good as the common Pea, like which it is cultivated.—Native of Italy, Spain, &c.

Pitcairnia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* one-leafed, three-parted, half superior, tubular, swelling at the base, permanent; segments lanceolate, erect. *Corolla:* three-petalled; petals linear, convoluted, with a nectariferous scale at the base. *Stamina:* filamenta six, inserted into the receptacle; antheræ oblong, erect. *Pistil:* germen half superior, three-cornered; style three-grooved; stigmas three, contorted. *Pericarp:* capsules three, opening inwards. (L'Heritier says, three-cornered, tricoccous, opening inwards three ways: Swartz says, thee-celled, with the seeds opening inwards.) *Seeds:* very numerous, winged, or membranaceous-appendicled on both sides, fastened to the receptacle. Essential Character. *Calix:* three-leaved or three-parted, half superior. *Corolla:* three-petalled, with a scale at the base of each petal. *Stigmas:* three, contorted. *Capsules:* three, opening inwards. *Seeds:* winged.——The species are,

1. Pitcairnia Bromeliæfolia; *Scarlet Pitcairnia.* Leaves ciliate-spiny; peduncles and germina very smooth. Root perennial, with long, filiform, subdivided, fibres; stem none; stalk central, erect, two or three feet high; petals and filamenta blood-red. It flowers in June.—Native of Jamaica, on the shady sides and precipices of the mountains.

2. Pitcairnia Angustifolia; *Narrow-leaved Pitcairnia.* Leaves ciliate, spiny; peduncles and germina tomentose.—Native of the island of Santa Cruz.

3. Pitcairnia Latifolia; *Broad-leaved Pitcairnia.* Leaves quite entire, somewhat spiny at the base. It flowers in August.—Native of the West Indies.

Pittosporum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, inferior, deciduous. *Corolla:* petals five; claws concave, converging into a pitcher-shaped tube; borders ovate-oblong, spreading. *Stamina:* filamenta five, inserted with the receptacle, alternate with the petals, the length of the claws, linear, compressed; antheræ incumbent, arrow-shaped, simple. *Pistil:* germen superior, roundish; style filiform; stigma obtuse. *Pericarp:* capsule subglobular-angular, mucronate, three-celled, three-valved; cells flowing with a liquid resin; partitions contrary to the valves. *Seeds:* three or four in each cell, angular, fastened to the partition. Essential Character. *Calix:* deciduous. *Petals:* five, converging into a tube. *Capsule:* two to five valved, two to five celled. *Seeds:* covered with a pulp.——The species are,

1. Pittosporum Coriaceum; *Thick-leaved Pitch-seed.* Leaves obovate, obtuse, very smooth, coriaceous; capsules two-valved. This is a green-house shrub, flowering in May: the stem is six or eight feet high, bushy, with round, finely downy branches, leafy at their summits; leaves crowded, alternate, remarkably coriaceous, of a fine green; flowers on umbelled pedicels, the length of the peduncle, tomentose, powerfully fragrant, like Jasmine, but of short duration.—Native of the Canary Islands.

2. Pittosporum Ferrugineum; *Rusty Pitch-seed.* Leaves elliptical, taper-pointed, smooth; footstalks clothed with rusty down; calix equally divided to the base. Stem shrubby, slender; flowers numerous, small, white.—Found in New Guinea and the Molucca isles.

3. Pittosporum Undulatum; *Wave-leaved Pitch-seed.* Leaves elliptical, pointed, smooth, waved at the margin; footstalks nearly smooth; calix five-toothed, split on one side to the base. A green-house shrub, flowering from April to June; flowers white, fragrant, in solitary, nearly simple, sessile umbels.—Native of New South Wales.

Plagianthus; a genus of the class Monadelphia, order Dodecandria.—Generic Character. *Calix:* perianth five-cleft, short; segments very small. *Corolla:* petals five, ovate, two closer together, more remote than the rest. *Stamina:* filamenta collected into a cylinder; antheræ about twelve, ovate, clustered on the top of the cylinder. *Pistil:* germen ovate, very small: style filiform, concealed within the tube of the stamina; stigma club-shaped. *Pericarp:* berry. Essential Character. *Calix:* five-cleft. *Petals:* five, two approximating, remote from the other three.——The only known species is,

1. Plagianthus Divaricatus. A shrub, with alternate, smooth, slender branches, clothed with a smooth, shining, purplish brown bark.—Native of New Zealand.

Plane Tree. See *Platanus.*

Plantago; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth four-cleft, erect, very short, permanent. *Corolla:* one-petalled, permanent, shrivelling; tube cylindric, globular; border four-cleft, reflex; segments ovate-acute. *Stamina:* filamenta four, capillary, erect, very long; antheræ somewhat oblong, compressed, incumbent. *Pistil:* germen ovate; style filiform, shorter by half than the stamina; stigma simple. *Pericarp:* capsule ovate, two-celled, opening transversely, having a loose partition. *Seeds:* several, or solitary, oblong. *Observe.* The calix in some species is irregular, in others regular. Essential Character. *Calix:* four-cleft. *Corolla:* four-cleft, with the border reflex. *Stamina:* very long. *Capsule:* two-celled, cut transversely.—Plants of this genus are seldom to be seen, except in Botanic Gardens: the greater number are hardy enough to bear the open air in our climate. They rise easily from seeds, of which they produce great abundance, and require no nicety in the cultivation. Some, however, must be screened from frost.——The species are,

1. Plantago Major; *Great Plantain,* or *Way-bread.* Leaves ovate, smoothish, shorter than the petiole; scape round; spike having the florets imbricate; seeds very many. There are several varieties. The root when old is the thickness of the thumb, præmorse, bitten off, or stumped, laying hold of the earth by its fibres, which strike deeply, and are whitish. The leaves have a weak herbaceous smell, and an austere bitterish subsaline taste; their qualities are said to be refrigerant, attenuating, substyptic, and diuretic. It was formerly reckoned among the most efficacious vulnerary herbs, and the

common people now apply the leaves to fresh wounds, and cutaneous sores. Inwardly, they have been used in phthisical complaints, spitting of blood, and in various fluxes, both alvine and hæmorrhagic. The seeds, however, seem better adapted to relieve pulmonary diseases than the leaves, being extremely mucilaginous. The roots have also been recommended for the cure of tertian intermittents, and not undeservedly, from the experience of Bergius. An ounce, or even two, of the expressed juice, or the same quantity of a strong infusion, may be given for a dose: but this quantity should be double in agues, and taken at the commencement of the fit. Plantain is said to be a cure for the bite of the rattlesnake; but probably with little foundation, although it is one of the principal ingredients in the remedy of the negro Cæsar, for the discovery of which he received a considerable reward from the Assembly of South Carolina. Remarkable success, says a late writer, has attended its use in the liver complaint, and for spitting of blood. We know a recent case of a person, who was for some years unable to attend his business, by reason of pain in the stomach, &c. who was speedily cured by using it as tea. A mode of preparation recommended, is this: Take the leaves, when free from moisture, bruise them in a mortar, wrap them in a cloth put in hot water for a time, and extract the juice; keep it bottled, and to a wine-glass full, add one-fourth of wine itself, for a dose. Plantain, says Meyrick, is of a cooling, astringent, healing nature. A decoction of the whole plant is good in disorders of the kidneys and urinary vessels. The root, dried and reduced to powder, and taken in doses of about half a drachm, is serviceable in fluxes of the bowels, attended with bloody stools. The expressed juice is good against spitting of blood, immoderate fluxes of the menses, and piles. The seeds reduced to powder, and taken, stop the whites. The leaves bruised, and applied to fresh cuts, soon heal them, and are good to cleanse and heal ulcers. The seeds afford food to many of the small birds, and cattle in general readily eat the leaves. It is a perennial plant, and flowers during the whole summer.—Native of most parts of Europe, and Japan, in meadows and gardens, and particularly by way-sides, from which it derives its common name.

2. Plantago Crassa; *Thick-leaved Plantain.* Leaves obovate, shining, waved, somewhat fleshy, subsessile; scape compressed below; flowers imbricate, remote at the base. This is a stiff roughish plant, very much divided, or many-headed: it bears the open air in summer, but must be taken into the green-house in winter. The root is perennial, consisting of a heap of thick, branchy, white fibres; the radical leaves are numerous, thick, erect, and either of an ovate or lanceolate form, from a channelled footstalk; spikes round, dense; seeds ovate, punctated, if viewed with a glass blackish, and not glossy.—It is thought to be a native of the south of Europe.

3. Plantago Asiatica; *Asiatic Plantain.* Leaves ovate, smooth; scape angular; spike having the florets distinct. This resembles the first species so much, that it might easily be taken for the same; the spike, however, is longer, the flowers remote, the leaves usually somewhat toothed at the base, and the scape angular. It flowers in July.—Native of China and Siberia.

4. Plantago Maxima; *Greatest Plantain.* Leaves ovate, somewhat toothletted, pubescent, nine-nerved; spikes cylindrical, imbricate; scape round. The root is fusiform, perennial, and the thickness of a finger; producing annually several leaves with long footstalks, which are marked in front with a furrow. It flowers in July and August.—Native of Siberia. It will bear the open air.

5. Plantago Media; *Hoary Plantain.* Leaves ovate, pubescent, longer than the petiole; scape round; spike cylindrical; seeds solitary. This species has the leaves small, and less blunt than in the Common Great Plantain: they are hoary, commonly five-nerved, lying close to the ground, on very short, dilated, petioles; spikes shoot close; root perennial, large when fully grown, penetrating deep, and having numerous lateral fibres, by which it supports itself in the most scorching seasons; it is also not destroyed by frequent mowing, as most lawns and grass-plats testify. A single drop of oil of vitriol on the crown of each root, is said to be the most certain mode of eradicating these plants.—Native of most parts of Europe, among grass, especially in calcareous and gravelly soils, flowering during the whole summer.

6. Plantago Virginica; *Virginian Plantain.* Leaves lanceolate-ovate, pubescent, somewhat toothletted; spikes having the flowers remote; scape round. In America it unfolds its corolla, and puts forth the stamina, which it scarcely ever does in Europe.—Annual, and a native of Virginia.

7. Plantago Altissima; *Tall Plantain.* Leaves lanceolate, five-nerved, toothed, smooth; spike oblong, cylindrical; scape angular. Root perennial; spike scarcely an inch and half in length, smooth, short, compact, and close, in proportion to the size of the plant.—Native of Italy and Silesia.

8. Plantago Lanceolata; *Ribwort Plantain.* Leaves lanceolate, entire; spike subovate, naked; scape angular. Root perennial, when old appearing as if bitten off at the end. Dr. Withering remarks, that the leaves, which come all from the root and are lanceolate, in maritime situations are toothed all along the edges. A spike will sometimes contain one hundred and thirty small flowers, crowded close together, with an ovate pointed scale or bracte at the base of each. The capsule contains two oblong shining seeds, of an amber colour in each cell. The stalks continue to grow after the flowering is over, and sometimes shoot out to the length of two feet or more. When it grows in meadows, the leaves are erect, and drawn up; but in a dry barren soil, they are shorter, broader, and more spread on the ground. It grows spontaneously by the sides of roads in dry pastures, where it is left untouched by cattle, to feed small birds with the copious produce of its seeds. It has been generally considered as a weed, occupying the room of grasses, and other useful herbs; but has lately been introduced into culture, under the name of *Rib-grass*, as a good food for sheep, or to be made into hay for cattle in general. Haller attributes the richness of the milk in the Alpine dairies to this plant, and *Alchemilla Vulgaris* or Ladies' Mantle. Linneus says it is eaten by horses, sheep, and goats, but refused by cows. Sheep will eat it either green or dried, provided it be well gotten; but it does not answer for pasturage, without a mixture of clover or grasses. The total absence of this plant in marshy lands, is thought to be a certain criterion of their wretched quality; for in proportion as such soils are improved, it will flourish and abound. Mr. Zappa of Milan, says, that this grass grows spontaneously in every meadow of Lombardy, especially in those which are irrigated; that it vegetates early, flowers at the beginning of May, ripens in five weeks, and is cut with *Poa Trivialis.* He describes the length of the leaves as about a foot, and the height of the stalk about a foot and half; that it multiplies itself much by the seed, and a little by the roots, which it continues for some time to reproduce; that it is eaten heartily by every sort of cattle, and particularly by cows in grass, who like it most in May, when it has great influence on their milk; that the hay is eaten more voraciously by cows, and has great influence on their flesh; in short, that it is one of the best plants either for the milk or the flesh.

Dr. Withering, Dr. Smith, and Mr. Curtis, do not esteem this plant as a pasture or meadow herb. Practical men, however, hold it in some esteem. Mr. Young informs us, that he long ago recommended this plant for laying land to grass, and sowed it on his own farm. At the same time he thinks it extravagant to propose Dandelion and Sorrel, as plants proper for a cow-pasture; and conjectures that these plants being found among good ones, have qualities attributed to them which they do not possess.—Dr. Anderson observes, that the Narrow-leaved Plantain, or Rib-grass, is very well liked by horses and cattle, and yields a very good crop upon rich ground tending to dampness, if it is at the same time soft and spongy; but that upon any soil which has a tendency to bind, or upon dry ground, it furnishes a very scanty crop. And it has been adopted in some parts of Yorkshire as a summer grass. As an article of pasturage for cattle and sheep, it is there in high esteem: it is not however much liked by horses; and as an article of hay, is held to be detrimental to the crop, retaining its sap an unusual length of time, and when fully dry, falls into a small compass, or is broken into fragments, and left behind in the field. One advantage of this plant is, that its seeds may easily be procured genuine. A small proportion of it may be eligible, as it has stood the test of many years' established practice, and appears to be esteemed even among observant husbandmen. Mr. Marshall tried it in Norfolk, as a substitute for Clover, but gained no credit from the experiment: the fact is, horses dislike it, and they are the principal consumers of the Clover crop in that county. It varies much in the size of the plant, breadth of the leaves, &c. The narrow leaves have only three ribs. The spike is sometimes surrounded by large leaves instead of the usual small bractes; it sometimes becomes an abortive panicle; and is also found with two or three heads.

9. Plantago Capensis; *Cape Plantain.* Leaves elliptic; of the spike distinct.—Native of the Cape.

10. Plantago Lagopus; *Round-headed Plantain.* Leaves lanceolate, somewhat toothletted; spike ovate, hirsute; scape round; border of the corolla even. It flowers in June and July.—This beautiful little plant, which is said to be a native of the south of France, Spain, Portugal, and Barbary, was found by Mr. Thomas Nuttall on the banks of the Missouri.

11. Plantago Lagopodioides. Leaves lanceolate, nerved, ciliate, toothletted; stem leafy; peduncles axillary; spikes ovate; bractes membranaceous; segments of the corolla ovate. Probably a mere variety.—Found on the sands near Tozzer in Spain.

12. Plantago Lusitanica; *Portugal Plantain.* Leaves broad-lanceolate, three-nerved, somewhat toothed, and hairy; scape angular; spike oblong, hirsute. According to Desfontaines, the leaves are oval-oblong, nerved, toothletted, running down into a short petiole, tomentose at the base, and attenuated both ways; scape striated, smooth, except at the top, where it is a little villose, with hairs pressed close; spike ovate, cylindrical, covered with a soft down. It flowers in July and August.—Native of Spain, and found near La Calle in Barbary.

13. Plantago Patagonica; *Patagonian Plantain.* Leaves lanceolate, linear, somewhat channelled, quite entire, woolly-haired; scape round, hirsute; spikes cylindrical; stamina not exceeding in length the tube of the corolla. This is very nearly allied to the next species, but the leaves are narrower, more linear, and nerveless. Annual.—Native of Champion river, in Patagonia.

14. Plantago Albicans; *Woolly Plantain.* Leaves lanceolate, oblique, villose; spike cylindrical, erect; scape round; bractes concave, ovate, membranaceous at the edge, the length of the calix; segments of the corolla ovoid, sharpish, rufescent; antheræ thick, yellow; style standing out, filiform, pubescent. Perennial, flowering from June to September.—Native of the south of France, Spain, and Barbary.

15. Plantago Argentea; *Silvery Plantain.* Leaves narrow-lanceolate, quite entire, silky, hoary; scape not striated; spike round; flowers very much crowded; bractes ovate, acute, membranaceous at the edge, shorter than the flower; corolla pale, rufescent, with the segments ovoid and smooth. It is allied to the preceding species, but has a shorter spike, round, with the flowers very much crowded, not interrupted when the fruit is ripe.—Native of Barbary.

16. Plantago Hirsuta; *Hairy Plantain.* Leaves linear, ciliate; spike cylindrical; scape hirsute.—Native of the Cape of Good Hope.

17. Plantago Alpina; *Alpine Plantain.* Leaves linear, flat; scape round, hirsute; spike oblong, erect. Root perennial, oblique, branched, creeping a little, often as if it were bitten off. According to Krocker, before the flowers open the spike hangs down; and after flowering, it becomes long and cylindrical. The bractes are as long again as the calix; the corollas are blackish; the capsules are smooth and distinct.—Native of Switzerland, Austria, and Siberia.

18. Plantago Bellardi. Leaves linear-lanceolate, hairy, higher than the round hirsute scape; spike ovate, erect. This is a small annual plant, often an inch, sometimes an inch and half in height; bractes lanceolate, attenuated, the length of the calix; segments of the corolla lanceolate. Desfontaines remarks, that it differs from the fourteenth species, to which it is allied, in having the hair spreading, not pressed close, the spike shorter and denser, the bractes awl-shaped, and the segments of the corolla very small.—Native of Spain and Italy.

19. Plantago Cretica; *Cretan Plantain.* Leaves linear, flat, hairy; scape round, very short, woolly; spike roundish, nodding. This is a small annual plant, when cultivated having the leaves longer, and not so closely woolly, and upon the whole putting on a very different appearance from the wild plant. Corolla yellow, with a purple eye.—Native of Crete.

20. Plantago Barbata; *Bearded-leaved Plantain.* Leaves oblong-lanceolate, somewhat toothed, bearded at the base; spike globular, four-flowered.—Native of Terra del Fuego.

21. Plantago Ciliata; *Fringed Plantain.* Leaves hoary, narrow-lanceolate; scape about the same length with the leaves, hirsute; heads of flowers round, leafless; corollas ciliate. This puts up several very short stems from the same head; bractes ovate, concave, pubescent, membranaceous at the edge, ciliate at the tip, the length of the calix, which is villose, and has elliptic segments; corolla of a pale rufous colour.—Native of the sandy desert near Cassa and Elhamah in Barbary. It is an annual plant.

22. Plantago Maritima; *Sea Plantain.* Leaves linear, almost quite entire, channelled, woolly at the base; spike subcylindrical; scape round. Root perennial, woody, inversely conical at the crown; stalk five or six inches high; corolla whitish. No plant varies more in size than this: its leaves being sometimes scarcely an inch, and at other times more than a foot in length. The height of the stalk is more constant, but the number of flowers in the spike varies extremely. It delights in a muddy soil, and is found on the highest mountains, as well as near the sea-shore. Dr. Withering notices two varieties: One *narrow-leaved* with filiform leaves, a much smaller plant than the common sort, and flowering earlier: this was found in the Isle of Wight, going out of

flower in the beginning of June. The other *flat-leaved*, with flat-ribbed leaves very sparingly toothed; stalk about five inches high, and cylindrical: observed near the Bristol Channel, and near Yarmouth in Norfolk. The Sea Plantain may be readily distinguished by its very fleshy and smooth leaves, channelled above, and concave below, with a tuft of wool at their base, and the spike, however short, always cylindrical.—It is common on sea-coasts, and in the salt-marshes of Europe, Barbary, and North America, flowering rather late in summer.

23. Plantago Subulata; *Awl-leafed Plantain.* Leaves awl-shaped, three-sided, striated, rugged; scape round.—Native of the south of Europe, especially on the sandy shores of the Mediterranean, growing in thick tufts; also about Tlemsen in Barbary.

24. Plantago Gracilis; *Slender-spiked Plantain.* Leaves lanceolate, toothletted, bluntish; scape round, not striated; spikes close, very long.—Native of Barbary.

25. Plantago Recurvata; *Recurved-leaved Plantain.* Leaves linear, channelled, recurved, naked; plant stemless. Annual.—Native of the southern parts of Europe, and of the Levant.

26. Plantago Macrorhiza; *Thick-rooted Plantain.* Leaves spathulate, gash-toothed; teeth imbricate, mucronate; scape round, hairy. Root thick, twisted, somewhat woody; spike very close, villose; bractes awl-shaped, a little longer than the flower, setaceous at the top; corolla rufescent, with small ovate-acute segments.—Native of Sicily and Barbary; found in the plains of Mazoule, and on the way-sides and rocky coasts of Tunis.

27. Plantago Serraria; *Saw-leaved Plantain.* Leaves lanceolate, five-nerved, tooth-serrate; scape round. This handsome species grows with some varieties in moist shady places.—Native of Silesia, Apulia, and Barbary.

28. Plantago Coronopus; *Buck's-horn Plantain.* Leaves linear, toothed; scape round. Root annual; spike cylindrical, from an inch or an inch and half to two inches in length; in sandy ground few-flowered, and so short as to be almost headless.—Native of most parts of Europe, Barbary, &c. in sandy and gravelly soils, and on the sea-coast; flowering all the summer.

29. Plantago Lœflingii; *Spanish Plantain.* Leaves linear, somewhat toothed; scape round; spike ovate; bractes keeled, membranaceous. This differs from the preceding, in being smaller and earlier, in having an ovate spike, with the flowers more imbricate; the bractes smooth and boat-shaped, whereas in that they are awl-shaped, very narrow, and pubescent.—It is an annual plant; native of Spain, &c. on hills and the borders of fields.

30. Plantago Carnosa; *Fleshy New Holland Plantain.* Very smooth: leaves lanceolate, deeply toothed, somewhat fleshy; naked, as well as the flower-stalk, at their base; flowers from one to three.—Found on Van Diemen.

31. Plantago Hispida; *Hispid New Holland Plantain.* Hoary and hairy: leaves linear-lanceolate, toothed; beardless, as well as the flower-stalks, at their base; spike of many imbricated flowers.—Native of the south coast of New Holland.

32. Plantago Amplexicaulis. Stem erect or simple; leaves lanceolate, somewhat fleshy, quite entire, embracing; heads subovate; peduncles in the heads of the axils of the leaves. It exactly resembles the eighth species. Annual.—Native of Spain.

33. Plantago Psyllium; *Clammy Plantain*, or *Fleawort.* Stem branched, herbaceous; leaves somewhat toothed, recurved; heads leafless. Root slender, annual, fusiform; corollas sharply four-cleft, of a whitish bay colour; peduncles axillary, villose, rigid.—Native of the south of Europe, Barbary, and the Canaries.

34. Plantago Squarrosa; *Leafy-spiked Plantain.* Herbaceous: stems branched, diffused, decumbent; leaves linear, quite entire; heads squarrose. From a white annual root proceeds a weak stem, incurvated at the base, and from thence, soon after its origin, oppositely branched, round, villose, and half a foot high; sometimes it grows extremely branchy. It flowers in August and September.—Native of Egypt.

35. Plantago Indica; *Indian Plantain.* Stem branched, herbaceous; leaves quite entire, reflex; heads leafy. It flowers in July and August.—Native of Egypt, and of many parts of India.

36. Plantago Pumila; *Dwarf Plantain.* Stem branched, herbaceous; leaves quite entire, fleshy; branches even. Root small, growing more and more slender as it descends, and fibrillose at the edge. It is an annual, tender, and weak plant, so much like the preceding species, that at first sight it might pass for a small variety of it. Peduncles solitary, filiform, hirsute, terminal, and axillary, rather shorter than the leaves, spreading.—Native place unknown.

37. Plantago Cynops; *Shrubby Plantain.* Stem branched, suffruticose; leaves quite entire, filiform, strict; heads somewhat leafy; peduncles axillary, the length of the leaves. It flowers from May to August.—Native of the south of Europe, Barbary, and Siberia.

38. Plantago Afra; *Barbary Plantain.* Stem branched, shrubby; leaves lanceolate; heads leafless; spikes several, at the ends of the branches.—Native of Sicily and Barbary, in the kingdom of Tunis, along the coast of the island of Talarque.

39. Plantago Parviflora; *Small-flowered Plantain.* Leaves opposite, linear, ciliate; peduncles shorter than the leaf; heads round; bractes pressed close, equalling the calix. Root long, slender, twisted, descending, putting out here and there capillary fibres; stems herbaceous, several from one tuft, slender, pubescent.—It is an annual plant, native of Barbary, in the great desert.

40. Plantago Data. Leaves ovate, cordate, very wide, subdentate, glabrous; spikes very long; flowers subimbricate, lower ones scattered; bractes ovate, acute.—Grows on the river sides in Canada, Kentucky, Tennessee, and other western parts.

41. Plantago Caroliniana. Plant glabrous on both sides; leaves lanceolate, very entire, long; flowers remote; stem cylindrical.—Grows in sandy grassy woods, from Virginia to Carolina.

42. Plantago Interrupta. Leaves ovate-lanceolate, very entire; spike long, slender, interrupted; flowers glabrous.—Grows in shady woods, from Virginia to Carolina.

43. Plantago Pauciflora. Leaves linear-lanceolate, very entire, slightly glabrous; scape cylindrical, shorter than the leaves; spike with few flowers, interrupted; bractes ovate, acute, glabrous.—Grows on the sea-coast of New England and New Jersey.

44. Plantago Aristata. Leaves subsetaceous-linear; spike oblong-cylindrical; bractes subulate-aristate, longer than the flower.—Grows in the natural meadows of Illinois.

Plantago Aquatica. See *Alisma Plantago.*

Plantain. See *Plantago.*

Plantain Tree. See *Musa.*

Plantain, Water. See *Alisma.*

Plantain, Wild. See *Heliconia.*

Plantations. See *Woods.*

Planting.—Although the method of planting the various sorts of trees is fully set down under their several articles, where each kind is mentioned, it may be of great use to give a brief general view of that important subject. The first thing in planting trees is obviously to prepare the ground. This should be done according to the different sorts of trees intended to be planted, and before they are taken out of the earth; for the less time they are out of the ground, the less danger there will be of their failure. In taking up the trees, carefully dig the earth away round their roots, so as to come at their several parts to cut them off; for if they be carelessly torn out of the ground, the roots will be broken and bruised, and the trees in consequence greatly injured. After they are taken up, the next thing is to prepare them for planting: in doing which there are two things to be principally regarded; the one is to prepare the roots, and the other to prune their heads in such a manner as may most promote the future growth of the trees. At first as it respects the roots: all the small fibres are to be cut off as near as possible to the place from which they are produced, except in those trees which are intended to be replanted the instant they are taken up, otherwise the air will turn all the small roots and fibres black, and then, if they are suffered to be replanted with the tree, they will grow mouldy and decay, and thereby greatly injure the new fibres which are produced, so that the trees often miscarry for want of this precaution. After the fibres are cut off, all the bruised or broken roots should be cut smooth, otherwise they are apt to rot, and distemper the trees, and all irregular roots which cross each other and the downright roots, especially in fruit-trees, must be cut off; so that when the roots are regularly pruned, they may in some measure resemble the fingers of a hand when spread open; then the larger root should be shortened in proportion to the age and strength of the tree. The particular sorts of trees also are to be considered, for the Walnut, Mulberry, and some other tender-rooted kinds, should not be pruned so close as the more hardy sorts of fruit or forest trees, which in young fruit-trees, such as Pears, Apples, Plums, Peaches, &c. that are but one year old from budding or grafting, may be left about eight or nine inches long, but in older trees they must be left of a much gieater length; but this is to be understood of the larger roots only, for the small ones must be quite cut out, or pruned very short. Their extreme parts, which are generally very weak, commonly decay after moving, so that it is better entirely to displace them. The next thing is the pruning of their heads, which must be differently performed in different trees, for the design of the trees must also be considered: if they be fruit-trees, and intended for walls or espaliers, it is the better way to plant them with the greatest part of their heads, which should remain on till the spring, just before the trees begin to shoot, when they must be cut down to five or six eyes, the process of which is fully described under the various kinds of fruit. But if the trees are designed for standards, you should prune off the small branches close to the places where they are produced; also, irregular branches which cross each other, and by their motion when agitated by the wind rub or bruise their bark, so as to produce great wounds. Besides, it makes a disagreeable appearance, and adds to the closeness of the head, which should always be avoided in fruit-trees, the branches of which should be preserved as far distant from each other as they are usually produced when in a regular way of growth, which in all sorts of trees is proportioned to the size of their leaves and the magnitude of their fruit: for when their heads are very thick, which is often occasioned by the unskilful shortening of their branches, the sun and air cannot pass freely between the leaves; so that the fruit must be small and ill-tasted. But after having displaced these branches, cut off all such parts of branches as have been accidentally broken or wounded, or they will remain a disagreeable sight, and often occasion a disease in the tree. By no means, however, ought the leading shoots to be cut off, according to the injudicious practice of many; for they are necessary to attract the sap from the root, and thereby promote the growth of the tree. From experiments made by cutting off the branches of several sorts of trees, and putting them into phials filled with water, the tops being closely covered to prevent the evaporation of the water, it was found that those shoots, the leading buds of which were preserved, did attract the moisture in much greater quantities than those shoots, the tops of which were cut off; and from several experiments made by the Rev. Dr. Hales, we find that great quantities of moisture are imbibed at wounds where branches are cut off; so that by thus shortening the branches, the wet, which generally falls in great plenty during the winter season, is abundantly imbibed, and, for want of leaves to perspire it off, mixes with the sap of trees, and thereby distending the vessels, destroys their contracting force, which often kills the tree, and generally weakens it so much that some years will elapse before it can be recovered. In order to satisfy himself fully on this point, Mr. Miller made the following experiment. I made choice, says he, of two standard Almond-trees, of equal strength and age. These I took up as carefully as possible, and, having prepared their roots as above directed, I pruned their heads in the following manner. Of the first, I only cut off the small branches, and such as were bruised or broken, but preserved all the strong ones entire; of the other, I shortened all the strong branches, and pruned off the weak and broken shoots, as is the common practice. These two trees I planted in the same soil and the same situation; gave them both equal attendance, and managed them as nearly alike as possible; yet in the spring, when these trees began to shoot, the shoots from that, the branches of which were entirely preserved, came out earlier, continued to shoot stronger, and appeared more healthy than the other. He afterwards made several other experiments, which succeeded in the same manner: from which it is reasonable to conclude, that the shortening the branches is a great injury to all newly planted trees, but especially to Cherries and Horse Chesnuts, which are frequently killed by shortening the large branches when removed.—Having thus prepared the trees for planting, the next thing is the placing them in the ground: if however the trees have been so long out of it that the roots are become dry, it will be advisable to put them in water for eight or ten hours before they are planted, observing to put them in such a manner that their heads may remain erect, and their roots only be immersed therein, which will swell the dried vessels of the roots, and prepare them to imbibe nourishment from the earth. In fixing them, great regard should be had to the nature of the soil; in which, if cold and moist, the trees should be planted very shallow; as also if it be a hard rock or gravel, it will be much better to raise a hill of earth where each tree is to be planted, than to dig into the rock or gravel, as is too often practised, whereby the trees are planted as it were in a tub, there being but little room for their roots to extend; so that after two or three years' growth, when their roots have extended to the sides of the hole, they are stopped by the rock or gravel, and can get no further, which causes the tree to decline, and in a few years die; besides, these holes detain the moisture so, that the fibres of the plants are often rotted thereby. But when they are raised above the surface of the ground, their roots will extend and find nourishment, though the earth upon the rock

or gravel be not three inches thick, as may be frequently observed where trees are growing upon such soils. The next thing is to place the tree in the hole in such a manner, that the roots may be about the same depth in the ground, as they were growing before they were taken up; then break the earth fine with a spade, and scatter it into the hole, so that it may fall in between every root, that there may be no hollowness in the earth; but by no means screen or sift the mould. After having filled in the earth, gently tread it close with your feet, but do not make it too hard, which is a very great fault, especially if the ground is strong and inclinable to bind. Having planted the trees, provide a parcel of stakes, one of which should be driven down by the side of each tree, and fastened to it, to support it from being blown down or displaced by the wind: then lay some mulch upon the surface of the ground about their roots, to prevent the earth from drying. This is to be understood of standard trees, which cast their leaves; for such as are planted against walls should have their branches fastened to the wall, to prevent the tree from being displaced by the wind; but there is no difference in their management, only to preserve their heads entire, and to place their roots about five inches from the wall, inclining their heads thereto; and the spring following, just before they shoot, their heads should be cut down to five or six buds, as is fully directed under the several articles of the different kinds of fruit. As to the watering of all newly-planted trees, it should be done with great moderation, nothing being more injurious to them than over-watering. Examples enough of this kind may be seen all over England, where plantations having been over-watered, whereby the greatest part of the trees have failed, or at least those which have survived have made little progress, through the abundance of water given to them having rotted off their fibres as soon as they were produced. And how can any reasonable person imagine that a tree will thrive, when the ground in which it is planted is deluged continually with water? From an experiment made by placing the roots of a Dwarf Pear-tree in water, the quantity of moisture imbibed decreased very much daily, because the sap-vessels of the roots, like those of the cut-off boughs in the same experiment, were so saturated and clogged with moisture, by standing in water, that more of it could not be drawn up. This experiment, it should be remarked, was tried upon a tree which was full of leaves, and thereby more capable to discharge a larger quantity of moisture than such trees as are entirely destitute of leaves: so that it is impossible such trees can thrive, where the moisture is too great about their roots. The seasons for planting are various, according to the different sorts of trees, or the soil in which they are planted; for those trees the leaves of which fall off in winter, the best time is in the middle or end of October, provided the soil be dry; but for a very wet soil, it is better to defer it until the latter end of February or the beginning of March, and for many kinds of evergreens the beginning of April is by far the best season, though some sorts may be safely removed at Midsummer, provided they are not to be carried very far; but always choose a cloudy time in that part of the year, when they will take fresh root in a few days. On the contrary, when these trees are removed in winter, during which time they are almost in a state of rest, they do not take root until the spring advances and sets the sap in motion; so that many times they die, especially if the winter prove severe. As to the preparation of the soil for planting, that must be adapted to the different sorts of trees, some requiring a light soil and others a strong one: and all these particulars the reader will find included under their proper heads. In this place it will be sufficient to observe generally, that though for the fruit-trees, a fresh soil from a pasture ground, such as is not remarkably light, dry, strong, or moist, but rather a soft loamy earth, is to be preferred, provided it be exposed some time. If it be for wall trees, the borders should be filled with this earth to the width of six or eight feet, and about two and a half deep. The depth should not be greater, because in that case the roots are enticed downward, which we have repeatedly remarked is very prejudicial to fruit-trees. The same also must be observed for standard trees, where fresh earth is brought to the places in which they are planted, not to make the holes too deep, but rather let them have the same quantity of earth in width; which is much to be preferred. There are some persons who direct the placing the same side of the tree to the south, which before removing had that position, as a material circumstance to be strictly regarded. The trials which Mr. Miller made, did not however enable him to discover the least difference in the growth of those trees which were so placed, and others which were reversed; so that he concluded it unnecessary to observe this particular direction. The distance which trees should be planted at, must also be proportioned to their several kinds, and the several purposes for which they are intended, all of which is explained in other parts of this work; but fruit-trees planted either against walls, or for espaliers, should be allowed the following distances: for most sorts of vigorous-shooting Pear-trees, from thirty-six to forty feet; for Apricots, sixteen or eighteen feet; Apples, twenty-five or thirty-feet; Peaches and Nectarines, twelve feet; Cherries and Plums, twenty-five feet, according to the goodness of the soil or the height of the wall.—This article has hitherto treated chiefly on fruit-trees and evergreens for gardens; but we shall now proceed to the planting of forest and other trees, which are in all large plantations of parks, and in extensive gardens, the most numerous. The modern practice of transplanting these sorts of trees from hedge-rows and woods, of large sizes, and at a great expense, has too generally prevailed in this kingdom, the generality of planters being in too great haste, and by a mistaken notion of saving time, begin by transplanting such large trees as they find on their own estates, or that they can procure in their neighbourhood, and please themselves with the hope of having fine plantations soon; but if, instead of removing these trees, they would begin by making a nursery, and raising their trees from seeds, they would save a great expense and much time, and they would have the constant pleasure of seeing their trees annually advance in their growth, instead of growing worse, as will always be the case where old trees are removed, though many flatter themselves with the hopes of success, when they find their trees shoot out in the following season; and as these will often continue to grow for some years after, they continue their expectations; till, after waiting many years, in which time they might have had seedling trees grown up to a fine size, if they had been sown at the time that the large trees were planted, they find their trees annually decaying, when they most expected their increase; for, says Mr. Miller, of all the plantations which I have seen of these large trees of any sort, there is scarce one which has ever succeeded. In some of these plantations, all the Elms which could be procured from the neighbouring hedge-rows have been removed, most of which having been suckers produced from the old stumps, have scarcely any roots: these have at a great expense been planted and watered, and perhaps many of them have made considerable shoots the whole length of the stem at every knot, and many of them have continued ten or twelve years alive without increasing half an inch in the girth of their stems;

and all that time have been growing hollow and decaying at heart, so that when a severe frost in winter or a very dry summer has occurred, they have produced an almost total destruction of these trees. In other places great numbers of tall Oaks have been transplanted, which have appeared to thrive for the first few years; but in five or six seasons after have begun to decay at the top, and died leisurely down to the ground, which is a most offensive sight to the owner. Indeed the common method of transplanting these invaluable trees is of itself sufficient to destroy them, if it were at all possible for them to survive their removal. The method alluded to is the practice of cutting off all their branches; for if the same tree were suffered to stand and have all its branches cut off, it would stint the growth so much, that it would not recover for several years, nor indeed could it ever afterwards arrive to the size of those which are suffered to retain their branches. The reason given for this practice is, that if the branches were left upon the trees, they could not be supported, because the winds would blow them out of the ground: another, which is bad philosophy, is, that as the roots have been greatly reduced by transplanting, so the heads of the trees should be reduced in the same proportion. As to the first, it must be allowed that trees which are removed with great heads, are with great difficulty preserved in their upright situation; for the winds will have such power against the branches, as to overset the trees if they are not very strongly supported with ropes. Therefore this may be brought as an objection to the transplanting of large trees altogether, rather than in support of a practice which is so extremely prejudicial to them. As to the other pretext, it has no foundation; for if large amputations be made at the root, there ought not to be the same inflicted on the head, because it will imbibe the air at every orifice, to the great injury of the tree. Besides this, if we pay any regard to the doctrine of the circulation of the juices in plants, we must allow that the heads of the trees are equally useful to nourish the roots as the roots are to the heads: so that if there be a waste of sap both at the top and bottom of the trees, it must weaken them in proportion. For whoever will be at the trouble to try the experiment on two trees of equal age and health, and cut off the branches from the one, leaving them on the other at the time of transplanting, if the latter be well secured from blowing down, it will be found to succeed much better than the other; or if the same thing be practised on two trees left standing, the tree, the branches of which are cut off, will not make half the progress of the other, nor will the stem increase in its bulk half so fast. Therefore where trees are transplanted young, there will be no necessity for using this unnatural amputation, and the success of such plantations will always afford pleasure to their owner. "I have seen," said Mr. Miller, "some plantations of Oak-trees, which were made fifty years ago, and had thriven beyond expectation most part of the time, but are now annually decaying, and seem as if they would not continue many years longer, while trees on the same soil and in the same situation, which were left standing, are in perfect health and vigour; and some of these transplanted trees which have been cut down, were found to be of little value, being shaken and decayed." We have often heard persons remarking, that from the spirit of planting which has prevailed of late years, great advantage will accrue to the public by the increase of timber; but whoever is skilled in the growth of timber must know, that little can be expected from most of our plantations, because few of our planters have set out right. No valuable timber was ever yet produced from trees transplanted after they attained to any considerable size; nor is any timber, even of the trees which are transplanted young, equal in goodness to that which has grown from the seeds unremoved. But above all, if we consider the sorts of trees usually planted, it will be found that they are not intended to produce useful timber; so that, upon the whole, it is much to be doubted whether the late method of planting has not been rather prejudicial, than productive of the increase of timber. Most people are so much in a hurry about planting, as not to take time to prepare their ground for the reception of trees, but frequently make holes, and stick them in amongst all sorts of rubbish which is growing upon the land; and afterwards there has been no care taken to dig the ground, or root out the noxious plants; but the trees have been left to struggle with these bad neighbours, who have had long previous possession of the ground, and established themselves so strongly in it as not to be easily overcome. Now, what can be expected from such plantations of deciduous trees? For it is allowed that Pines and Firs, if once well rooted in the ground, will soon get the better of the weeds, and in time destroy them. There are some careful individuals who begin better, and will be at all the trouble and expense of preparing the ground and planting the trees, but take very little care of them afterwards: so that in the year after they are planted, it is common to see them overgrown with weeds, that always retard the growth of young trees, and sometimes entirely destroy them. On this account, says Mr. Miller, I would advise every person who proposes to plant, to prepare the ground well beforehand, by trenching or deep ploughing, and clearing it from the roots of all bad weeds; which will lay a sure foundation for future success and profit. No person should undertake more of this work than he can afterwards keep clean, for all plantations of deciduous trees will require care and attention during the first seven years. All small plantations therefore should have the ground annually dug between the trees; and between those that are large it should be ploughed: this will enable the roots of the trees to extend themselves, so that they will find a much greater quantity of nourishment, for by loosening the ground, the moisture and air will more easily penetrate to the roots, to the no small advantage of the trees: but, besides this operation, it will be absolutely necessary to hoe the ground three or four times in the summer, either by hand or with the hoe-plough. This will be objected to by many, on account of the expense; but if the first hoeing be performed early in the spring, before the weeds have gotten strength, a great quantity of ground may be gone over in a short time; and if the season be dry when it is performed, the weeds will presently die after they are cut: and if this be repeated before the weeds are come up again to any size, it will be found the cheapest and very best husbandry; for if the weeds be suffered to grow till they are large, it will be more expensive to root them out and make the ground clean; and they will have already robbed the trees of great part of their nourishment. It is sometimes said to be necessary to let the weeds grow among trees in summer, in order to shade the roots and keep the ground moist; but this has come from persons of no skill, and the following is an exposure of this fallacy. If the weeds be allowed to grow, they will certainly absorb all the moisture from the roots of the trees for their own nourishment, so that the trees will not profit by the kindly dews and gentle showers of rain which are so beneficial to young plantations: these will be entirely imbibed by the weeds; so that great rains only can descend to the roots of the trees. Whoever has the least doubt on this head should try the experiment, by keeping one part of the plantation clean, and suffer the

weeds to grow on another, and the truth will be seen in the different growth of the trees: in short, though the weeding and cleaning is attended with an expense, the produce will amply repay it, beside the pleasure that the sight of clean and orderly ground affords. In the disposition of trees in parks, and of shrubs and trees in gardens, there are very few of those who call themselves Designers, who have had much regard to this particular; for in most of the modern plantations, it is not uncommon to see an Oak, an Elm, or some other large-growing tree, planted where a Rose-bush, a Honeysuckle, or a Sweetbriar, might with more propriety occupy the space; so that in a few years, if these large trees were left growing, the whole plantation must make a disagreeable appearance. See *Nursery*, and *Woods*.

Plants, Diseases of.—Very little being satisfactorily known, till lately, upon this subject, which is of the utmost practical importance to Farmers, Gardeners, Agriculturists, and every lover of botanical science; the following able little treatise, recently translated from the German, of the accurate and indefatigable *Willdenow*, is here inserted. It not only describes the disease, but the cause, and the best means for restoring diseased plants to health and vigour. Such directions have been long wanted, and the Translator, from whose labours we have extracted it, has certainly rendered a public benefit to his country. "Plants," says Willdenow, "are, like all other organized bodies, subject to a great many diseases. The most common causes are, improper soils, preternatural habitations, late frosts at night-time, long-continued rain, great drought, violent storms, parasitic plants, insects, and wounds of various kinds. Disease in plants, is that preternatural state by which their functions, or at least some of them, suffer, and the purpose for which they are destined prevented. The diseases of plants are of different kinds; they attack either the whole plant, and are then called general diseases; or they only affect single parts, when they get the name of local diseases. We style those diseases Sporadic, which, out of a great number of the same species of plants, only attack one or two, as consumption; Epidemic, on the contrary, when they attack a great number of plants, such as gangrene, necrosis, rubigo, and others. The diseases of plants are either such as attack them externally, and are occasioned by various causes, or they proceed from internal sources. The former are, upon the whole, much more easily healed than the latter. The diseases which proceed from internal causes, originate in the increased or diminished irritability of the fibre, and this may be also produced by a variety of causes. The cure of plants is very simple: either the injured part is cut off, or the soil, the situation, and the degree of temperature, altered. To these expedients only, the healing of all plants is restricted. In vegetables, as well as in animals, diseases occur which are incurable, as consumption, canker when it is concealed, mutilation, deformity, &c. Most of them, however, may be remedied.—*Vulnus*, or a wound, is the separation of the solid parts by external violence. It may be occasioned purposely by cutting off branches, or accidental rubbing off; by friction of cattle; or by friction against another object, when the wind agitates the stem; by the bite of animals; by the falling off of the parasitic plants; or even by very large hailstones. In all these cases, it is necessary to prevent the access of air to it, by some good firm cement, or grafting wax. But if the wound has remained long uncovered, and exposed both to wind and rain, and is of a great size, then the affected part must be cut off down to the sound wood, to prevent greater mischief, and the whole afterwards be covered with wax. The means of preventing wounds are obvious. Branches must be cut off cautiously; the access of cattle must be obstructed; trees brought up, so as not to be fastened to stakes; or, if it cannot be avoided, to place three or four posts or stakes round each, and tie them up very gently. In violent storms, it is indeed better to let them loose, and leave them to themselves. Parasitic plants must be eradicated. Against the bite of smaller animals, and hail, precautions cannot always be taken.—*Fractura.* Fracture is the separation of the stem and branches into many pieces. This may arise from the violence of the wind, from too great an abundance of fruit, much snow, or even from lightning. It is remarkable, that lightning runs along every species of trees, almost always in a different manner. The birch (Betula *alba*) is, in this respect, different from all other trees, that the lightning never runs along its stem, but only at the top beats off the boughs almost in a circular direction. A fracture, if not complicated, and on branches or young stems only, may be healed without difficulty. But when accompanied with contusion, or happening in trunks of old or gummy trees, no way of recovery is known. In young trees and branches, even sometimes in old ones, when instantly discovered, fractures heal easily, especially in spring till the end of June, provided every part be brought into its natural position, firmly tied up, and properly supported. But if there is contusion, or if a thick stem or bough is affected, the bough must be cut off, or the stem cut down, to get new shoots from the stock or from the root. To prevent such an accident, trees with fragile boughs must be, as much as possible, sheltered from the wind. Fruit-trees should not, when pruned, have all their gems left; and care should be taken in gardens, that the snow do not overload the boughs. Against the flash of lightning, no means are of any service, except bringing conductors, a plan which would be too expensive, and even impracticable.—*Fissura.* Fissure is the separation of the solid parts into an oblong cleft, which ensues spontaneously. It proceeds from two causes; fulness of juice, or from frost. To heal a split, nothing else is required than to put good grafting wax on the wound, that the rain or other contents of the atmosphere may not destroy the stem. To prevent clefts, the bleeding or scarifying, as it is called, of such trees, the bark of which is very hard, may be of service. A moderate incision is made through the bark longitudinally; and a plant that has too rich a soil, by which it becomes too succulent, should be transplanted into a poorer soil. To defend them against frost, plants should be covered with straw. A cleft occasioned by frost, sometimes degenerates into a chilblain, from which afterwards, especially in Oaks, a blackish sharp liquor exudes, which at last produces exulceration.—*Defoliatio notha*, is when the leaves fall not at the proper period, but much earlier. It is occasioned by men, insects, acrid fumes, dust, and constant dry weather. In whatever way it may happen, all depends on the nature of the plant affected with it, and on the season of the year in which it happens. If it be a fast-growing tree, and the injury happens before August, the tree may, if taken good care of, easily get leaves again, only it will have smaller foliage for the present season. But if the leaves fall after that period, and cool weather comes on earlier than usual, or if it happens at a much later season, the plant may be unwell for several years before a complete recovery takes place. If, on the contrary, it happens late in autumn, just before the natural fall of the leaves, then it has no bad consequences; except the plants be natives of a warmer climate, and the branches which have appeared already, be not yet hard enough, in which case they will lose those branches, and perhaps some of the older ones, by the invasion of cold. The defoliation by men, which is performed sometimes in spring, particularly with the Mulberry-

tree for bringing up the silk-worm, should be avoided, or at least done with moderation. Insects which are noxious to plants, should be accurately known, and their way of propagation understood, in order to obviate the bad effects which they produce, and to check their too great increase. Change of place is the only means of preventing the noxious influence of acrid fumes, of great manufactures and iron-works, and the like, as well as of dust. In long-continued drought, careful watering is advisable. The falling off of the leaves in autumn is quite consistent with nature, and of no bad consequence whatever; except, perhaps, when the leaves are dropping off too soon, on account of early night-frosts, and these can affect only delicate foreign plants, of which care should be taken. —*Hæmorrhagia*, is of two kinds, spontaneous, or occasioned by wounds. The Birch and Maple, when wounded, emit a great quantity of juice, which, when allowed to flow too copiously, may end in the death of the plant. Spontaneous hæmorrhagy arises from the great irritability of the plant, and the soil is generally the accidental cause. The soil is either what, in common language, is called too rough, that is, it promotes too rapid a separation of the juices, which, on account of their large quantity, cannot be received into the vessels, and therefore must be discharged, and then they acquire in the air a corrosive property, by which the parts are destroyed; or the soil is too rich in general, rendering the plant full of juices, but unable to retain the moisture, which, therefore, without corroding the posterior parts, they discharge, or deposit only externally their gummy constituents. In most cases, spontaneous hæmorrhagy is incurable. Spontaneous hæmorrhagy, from superabundance of sap, is either gummous, as in fruit-trees, or of a watery nature, as in the Vine. This last species has been styled *lachrymatio*. The gummous hæmorrhagy proves rarely fatal, but should not be allowed to make too much progress, and the wound should be healed up by wax. The watery hæmorrhagy in the Vine, has no bad consequences whatever; for this plant is the same in winter as all ligneous plants. The radicles of it, which have been formed during the cold season, imbibe a great deal of moisture from the ground, which they convey to the stem. But as the weather is not soon enough favourable for the shooting of it, and as the radicles imbibe more sap than the tender stalks can contain, the superfluous sap exudes from the gems or buds. In warm climates, the Vine does not lachrymate; for there the leaves can unfold themselves instantly, and the sap of course is properly digested. This watery discharge of the Vine is not, therefore, to be considered as a natural secretion, peculiar to the plant, but as the effect of cold climates. It, however, does not hurt the plant.—*Albigo*, or mildew, is a whitish mucilaginous coating of the leaves of plants, which often causes their decay. It is produced by small plants, or by insects. The first kind appears on the leaves of Tussilago *farfara*, Humulus *lupulus*, Corylus *avellana*, Lamium *album*, *purpureum*, and others. It is a small species of fungus, of great minuteness, which covers the leaves: Linneus calls it Mucor *Erysiphe*. The second kind is a whitish slime, which some species of Aphis deposit on the leaves. As soon as there is the least appearance of mildew, all the leaves stained with it should be plucked off and burned. In scarce and delicate plants, the leaves ought to be washed. But where it is produced by aphides, a weak decoction of the dry leaves of tobacco will be found most serviceable. But if all parts of a plant are attacked, and the plant is hard and of long duration, then the parts must, according to the nature of the plant, be taken off. If it is an annual plant, and of great delicacy, it will be best to wash it with a brush dipped in the decoction of tobacco, and afterwards to expose it to the open air.—*Melligo*, or honey-dew, is a sweet and clear juice which, during hot weather, is frequently found upon the leaves, rendering them sticky, and, especially when there is a want of rain, causing them to fall off. This sweet matter is likewise secreted by aphides, from peculiar glands at the anus. In tender plants, washing with water, or with the above decoction, is of great benefit; the fumes of tobacco, likewise, kill the insects.—*Rubigo*, or rust, appears on the leaves and stems of many plants. It consists of yellow or brown stains, which, when touched, give out a powder of the same colour, which soils. Microscopical examination has shewn, that the rust-like matter is a small fungus, which is called Æcidium, and the seed of which form this brownish soiling powder. We find them frequently in the leaves and stems of Euphorbia *cyparissias*, Berberis *vulgaris*, Rhamnus *catharticus*, of some Gramina, of Wheat, Oats, &c. If they are very numerous, especially in the different species of Gramina and Corn, consumption of the whole plant is the consequence. Little can be done against this affection. In grain, some have recommended to moisten the seed, before sown, in salt or lime-water, or to sow grain from countries where this disease does not prevail. Precautions are of no use.—*Lepra*, is frequently met with on the trunks, especially of young trees. If trunks are so entirely covered with algæ, that the pores of the cutis are obstructed, we call the distemper *lepra*. Old trees have their trunks full of algæ, without suffering any injury, provided the smaller branches be free of them. But if young trees or shrubs grow in too sterile a soil, in too thin a stratum of fertile soil, in gravelly soil, in improper situations, too moist or too dry, if they are, against their nature, too much exposed to wind, then they sicken, their bark cannot perform, with proper vigour, the functions peculiar to it, as the skin of the tree, and they grow at last, even at their young boughs, all over with fungi of all kinds. Vigorous adjacent plants, which are perfectly sound, will have few or no fungi on their stems. The lepra increases sickness in plants, and they die at last of a consumption, if not cleared of the fungi, if their cutis is not washed, and they are not transplanted to better situations and more proper soils.—*Gallæ*, or galls, are produced by small flying insects, the cynips of Linneus. Galls are round, fleshy, variously shaped bodies, which appear on the stem, petioles, peduncles, and the leaves. They are formed in the following manner: The little insect pierces with its sting the substance of the plant, and deposits its eggs in this small aperture. The few air-vessels thus injured get a different direction, and twist round the egg. The irritation which the sting produces occasions, as always in organized bodies, a greater flow of the sap towards the wounded place; the sap is deposited in greater quantity than it ought to be, and a fleshy excrescence arises. The little larva which leaves the egg is nourished by the sap, grows up, changes into a pupa, and escapes at last as a perfect insect, which propagates itself again in the same way. It is singular, that each particular fly produces a gall of a peculiar form. This, perhaps, may depend on the peculiar structure of the eggs of each species; for we find, that the eggs of different insects, when viewed with the microscope, assume peculiar shapes. On the Oak-tree, we find a variety of galls; likewise on the Salix, Cistus, Glechoma, Veronica, Hieracium, Salvia, and other plants. The galls of Salvia *pomifera*, which got its name from that circumstance, are said to be of a pleasant taste, and are considered as an excellent dish in the Oriental countries. To remedy this affection, we can do nothing, but cut off the galls as soon as they appear; yet this can be done only in very delicate plants, which we wish to preserve. The disease, however, rarely proceeds

such a length as to hurt the plant materially.—The *Folliculus carnosus foliorum*, is a gall of a particular kind, which is subulate and acute. It is found in Populus *nigra* and Tilia *Europæa*, and covers the whole surface of the leaf. It arises in the same way as the former, and by its great number sometimes sickens the plant. Contortions, owe their origin likewise to insects, which produce a swelling and contortion of the leaves; hence they become contorted, which is the characteristic feature of the disease. It occurs in Cerastium, Veronica, Lotus, Vaccinium.—*Verruca*, or wart, is a small protuberance, which occurs chiefly in fruits, for instance, in apples. Here insects are not the cause, but accidental occurrences. Of the same kind are the moles. They arise from the wounds of the cutis. Both diseases are not hurtful, and, as yet, we know no means to prevent them.—*Tuber lignosum*, is met with on trunks of trees. It seems to be produced partly by insects, partly by changes of weather. It arises from a disturbance in the active vessels of the inner bark, which by the application of stimuli several times convolve, without forming buds or boughs. They form, instead of this, great knobs, which often, in a bad situation, especially through moisture, exulcerate. It not unfrequently grows very large, without the least injury to the tree.—*Squamationes*, or spongy swellings, are produced like galls. A small insect lays its eggs in the apex of a bud. Thus injured, the branch, which was to be formed from the bud, cannot be properly unfolded, it remains quite short; all its leaves, therefore, expand themselves from one point, but they are of small size. The whole has somewhat the appearance of a rose. This may be often seen in willows. Such spongy swellings are of bad consequence when in great numbers. The only way to extirpate them, is, to cut them off before they are properly formed.—The *Bedeguar* occurs in roses only, and has the same origin as the former, with this difference, that the insect which gives rise to the bedeguar, deposits a number of eggs in one heap, in the middle of the bud. From this a fleshy mass of the size of a fist arises, which is covered all over with hair-like coloured elongations, but never has leaves.—*Chlorosis*, is that affection of plants, when their green colour entirely disappears, and all their parts grow whitish. It arises from diminished stimulus, the plants cannot excrete their oxygen, which therefore is accumulated. There are three causes of the disease: want of light; insects; and bad soil. As soon as the plant is deprived of light, it cannot disengage the oxygen, hence it assumes a white colour, which however instantly goes off when the rays of the sun are again admitted. This is the reason why plants, in dark rooms, between great masses of stone, in deep clefts of rocks, beneath the dark shade of shrubs and trees, &c. grow pale, and of a whitish colour. Insects, which bite off the radicles of plants, or even nestle in them, and consume their food, debilitate their vessels, render them insensible of the stimulus of light, and at last chlorotic. This occurs very frequently in Secale *cereale*. Here no remedies are of any use. Improper soil, from which plants do not get a sufficient quantity of proper food, sometimes renders them chlorotic. In such cases plants may recover by change of soil.—*Icterus*, differs from chlorosis, only in its colour, and by its cause, which is cold coming on early in autumn. It is indeed the natural death of the leaves, and can only hurt the plant itself when the cold begins in autumn before the due time.—*Anasarca*, or dropsy, rises in plants from long-continued rain, or too profuse watering. Single parts, in this case, are preternaturally swelled, and commonly putrefy. Some of the bulbous and tuberous roots, for instance, are often greatly swelled after rain. Fruit becomes watery and tasteless. Seeds do not get ripe, or the plant pushes out young shoots unseasonably from the stem. Most of the succulent plants suffer from too copious a supply of water. Anasarca in plants is generally incurable.—*Phthiriasis*, is that disease of plants where the whole is covered with small insects, which suck out all its sap, suppress the function of transpiration, and of course hinder the farther evolution of its parts. This disease is produced by three different species of insects. By the Aphis, of which each plant has almost a peculiar species. By the Coccus, of which there are various species. That which in our hot-houses is mostly met with, the Coccus *hesperidum*, is the most dangerous; those which are commonly found on the roots of Scelanthus, Polygonum, and others, are less noxious. The disease is, lastly, produced by the Acarus *telarius*, a small mite, which in hot-houses likewise spins a very delicate web over the leaves of the plants, and thus destroys them. Against the Aphis, careful cleaning, or even brushing with suds, or a decoction of tobacco, or strong fumigation with tobacco, or sulphur in close rooms, may be of service. The same means may be employed against the second species, where it may likewise be very beneficial to place the plant, as soon as the temperature is mild, in the open air, in a shady but airy place. This last destroys the canker, which in hot-houses chiefly attacks the genera Sida, Hibiscus, Dolichos, and Phaseolus.—*Verminatio*, or worms, is not, as in the animal kingdom, produced by worms, but by the larvæ of insects. The stem, leaves, and fruits, are attacked by it. The stem of some trees is very often eaten through, and must sometimes entirely decay on this account. The willow, Salix *alba*; horse-chesnut, Æsculus *hippocastanum*; and Typha *latifolia*, may, in regard to the stem, serve as very common instances. The leaves are often inhabited by the well-known mining-worm, especially the leaves of cherry-trees. Fruits, as plums, apples, pears, hazel-nuts, and the grain of corn, and the like, are inhabited by the larvæ of insects, which sometimes destroys them. Except the destruction of the larvæ, no remedies will resist these ravaging enemies.—*Tabes*, or the consumption of a plant, is frequently a consequence of the already mentioned diseases, or those which we have still to explain. It may however also originate from sterile or improper soil, unfavourable climate, awkward transplanting, exhaustion of strength from too frequent flowering, insects, ulceration, &c. The whole plant gradually begins to decline, and dries up. As soon as this disease really appears, help is rarely possible. Teredo *pinorum*, is a kind of tabes, which attacks principally the alburnum and inner bark of Pines. The disease arises from long-continued dry weather, or violent frost of long duration, especially after preceding mild or warm weather, and violent gales of wind. Its signs are, an unusual discolouring of the acerous leaves, which are more or less of a reddish yellow hue. A great number of small drops of resin appear on the boughs, and, lastly, a putrid turpentine-like odour spreads in their neighbourhood; the bark comes off, and the alburnum presents a blackish-blue appearance. At the same time the well-known beetle appears, with several similar species of insects. The Teredo is an incurable disease, and in large forests nothing more can be done than to permit the removal of the pointed leaves or the moss round the roots of the Pine trees, as the trees are thereby weakened, and so much sooner exposed to this misfortune.—*Debilitas*, s. *deliquium*. Plants which suffer from debility have all their parts, stem, leaves, flowers, &c. hanging down quite relaxed. Debility owes it origin to foul air, want of light, of leaves, or of moisture, too strong light, and other causes, which we must endeavour to remove, in order effectually to remedy this evil.—

Suffocatio incrementi, is a sterile or weak growth, the leaves become pale, and smaller, and at last the whole plant decays. It is different from consumption in this, that the causes of it are only accidental, and may be removed, so that the plants may still recover. Bad growth is occasioned by parasitic plants, twining plants, and too glutinous a soil. When those impediments to growth are removed, the plants will soon recover.—*Exulceratio*, is a corroded part of a plant, from which proceeds an ichorous filthy water. It takes place after wounds which are not properly taken care of, or which have such an unfavourable situation, that rain or snow may stagnate in them. Farther, it is produced by insects, or spontaneously by unknown causes. No ulcer heals of itself in plants; it is more or less destructive, the slower we are in bringing assistance. All ulcerated parts ought to be taken off, and the sound parts covered with a coating of grafting wax, or of Forsyth's cement. An ulcer often corrodes wood, pith, or other parts of trees, from neglect of the gardener; in this case, all that is affected, must, without loss of time, be cut away, and, as just now mentioned, the access of moisture must be prevented by the application of some grafting wax or cement. From unknown causes, the bulbs of Hyacinths and other fleshy roots exulcerate. We must endeavour to effectuate their cure by putting them in a dry place, taking off the diseased part, and covering it with cement. However, we rarely succeed, as the bulbs are mostly destroyed to the very centre. The best remedy for plants is the grafting wax, if well prepared; but in many cases, especially for large wounds, Forsyth's cement, for the receipt of which the king of England paid 15,000 dollars, is by far preferable to the former. It consists of sixteen parts of cow-dung, eight parts of dry lime taken from an old building, as much charcoal, and one part of sand out of a river, which are to be mixed together into a thick salve. In place of cow-dung, ox's blood, and instead of lime, dry chalk, may be employed. This cement is to be spread thinly on the affected part, and to be rubbed with a powder, consisting of six parts of charcoal, and one part of the ashes of burnt bones or carbonate of lime, till the surface of the cement is as smooth as if polished. Forsyth did wonders with this preparation, and cured with it all wounds of plants without any further trouble. It does not keep well, and therefore only as much of it must be prepared, as is wanted for the time, or, if it is to be preserved, it must be sprinkled with urine. It should further only be applied during dry weather, by which means it covers the wound with a cortex. Rafn asserts, he had experienced the same good effects from a mixture of pounded coal and potatoes, or some other soft substance, and even prefers this to Forsyth's mixture.—*Carcinoma arborum*, or a cancerous affection, occurs principally in fruit-trees, when they lose too much gum, and this undergoes an acid fermentation. This disease appears frequently in low-lying gardens after deluges. A great spongy excrescence rises, which even in the driest weather discharges an acrid ichor, which corrodes every thing. We distinguish two species, the open and the latent cancer. The first species is easily seen, and cured by simply extirpating the affected part. But the second species may have spread far in length, and under the cortex, before it is discovered. We must then hasten to save the tree, and, after removing the wounded part, apply Forsyth's cement to it. To obviate this disease, we must improve the station of the plant, and endeavour to prevent too much formation of gum in fruit-trees.—*Necrosis*, or dry gangrene, is that disease which causes the leaves or other parts to grow black and dry. It arises from late night-frosts, severe cold in winter, burning heat, suppuration of the sap in single branches, and by smaller plants. Late night-frosts, very frequently kill young shoots of plants, which therefore grow black, and shrink. No other preservative can be used against this than covering young plants as soon as cold nights may be dreaded. Some assert, that they have derived great advantage from conductors of frost, which consist of a compactly twisted cord of straw, directed into a vessel with water. From severe winter cold, foreign trees suffer chiefly, and such of our native plants as are very delicate. Their inner bark freezes, becomes black, and it is impossible to save them. All the wounded part must be clipped, and the main trunk with the roots only be allowed to remain, to produce new shoots. Intense heat will produce the same bad effects in gardens, or even in forests, where foresters are permitted to remove the mosses and dry leaves from the roots. Single branches sometimes, by the too rapid growth of others, are deprived of their necessary food, and wither away. This may happen without any injury to the plant. Small fungi occasion this disease in the bulbs of the Saffron; it is a nuredo which destroys them. On the Gold coast of Africa, a wind blows called Harmattan, which kills the plants, making their leaves dry and black.—*Gangræna*. Plants affected with gangrene become soft and moist in some single parts, which at last dissolve in a foul ichor. It chiefly attacks fruits, flowers, leaves, and roots, rarely the stem. Gangrene arises either from too moist or too fat and luxurious ground, from infection and contusion. It scarcely admits of a cure, as it infests only single parts; but if the causes which give rise to it are removed, it may be prevented.—*Ustilago*, appears especially in the species of gramina and grain; rarely in other plants; sometimes in Scorzonera, Tragopogon, &c. It arises from a small fungus, which occupies the whole ear, which therefore cannot evolve. Every part of it, on the contrary, becomes a black soiling mass. Moist seasons are most favourable for its evolution, and its formation is, under such circumstances, very rapid. That corn may not be affected with it, such grain only should be sown which has not been kept in damp places, nor has been got from where the disease prevailed. It is natural to suppose that the infection would by such means be propagated. Neither should the grain be placed too deep in the ground, especially where the soil is very fat or moist. When, however, it is once begun, the plants diseased cannot be cured. In tender and scarce garden plants, something may be done, by amputating the diseased part before its perfect formation. But in general, this expedient is not advisable.—*Mutilation*, happens especially in flowers, and the name *flos mutilatus* is used, when single parts of a flower, particularly the corol, are not come to perfection. The causes of this mutilation are unfavourable climate, and improper soil. Flowers, notwithstanding this mutilation, often bear perfect seeds. The species of violet, Viola *odorata* and *canina*, often produce in our climate, if the weather is not warm enough, flowers wanting the corols. Campanula *hybrida* has here no corols, but is said to have them in France and Italy. In several of the campanulate flowers we see frequently the corol wanting; for instance, in Campanula *pentagona*, *perfoliata*, *media*. Some other plants, as Ipomœa, Tussilago, Lychnis, are liable to the same accident. Ruellia *clansdestina* is thus called, because it has sometimes flowers without the corols, sometimes with them. The same is said to be the case in its native country, Barbadoes. Hesperis *matronalis*, during long-continued moist weather, from superabundance of food, frequently bears blossoms, where the corol becomes a second calix. The Dianthus *caryophyllus* augments the scales of its calix so

much that the flower becomes somewhat like the ear of wheat, and the corol never appears. Less conspicuous is this disease, when a few stamens only are not so properly formed as the rule requires.—*Monstrositas*, is the preternatural form of single parts or a whole plant. In the flower and fruit the monstrosity is often such as to prevent their use entirely. The stem is sometimes writhed, bent, knotty, too much depressed, and in a lying posture. Cold climates in general make plants rough, small, and crippled. On high mountains the tallest trees are at last reduced to a small size. A monstrosity is sometimes observed in leaves, by their becoming deformed, either larger or more numerous, thicker, or frizzled. Every person has seen Trefoil with four leaves, or the preternaturally red-coloured leaves of the Beech-tree, and other varieties belonging to this class. Fruits likewise are variously deformed; they are either very large or very small, grown together, distorted, crooked, and the like. These may, however, produce good seeds. But fruits which are doubled, where, when one is cut, a second one appears in its interior, as sometimes happens in citron, and fruits which have no seeds, (as, for instance, the Bromelia *ananas*, Musa *paradisiaca* Artocarpus *incisa*, Berberis *vulgaris*,) entirely fail us in the end for which they were intended by nature. Monstrous flowers are of no value for the botanist, as their sexual organs are wanting, and he is unable without these to ascertain the genus. They are only of some importance to him, if they elucidate any points in physiology. They are particularly agreeable to garden amateurs, who have so vitiated a taste as to despise simple nature in all its beauty, and with care often transplant these deformities into their gardens.

"The deformities in flowers are the following:—Flos *multiplicatus*, a double flower; Flos *plenus*, a full flower; Flos *difformis*, a deformed flower; and lastly, Flos *prolifer*, a proliferous flower.—Flos *multiplicatus*, a double flower, is the beginning of a full flower. Flowers are styled double, when their petals exceed the usual number, but stamens and pistil still remain to accomplish impregnation, and to produce ripe seeds. The first beginning of a double flower is the corolla *duplex*, or *triplex*, when the corol becomes double or treble. Monopetalous corols are often double; for instance, Datura and Campanula; but polypetalous corols still more frequently. As long as the pistil remains perfect in a flower, and it can bear seeds, so long the flower is called double. The cause of this deformity is the same as in the following. Very little care is taken to remedy this evil, as gardeners even like to see full and double flowers. But if botanists wish to see double flowers of herbaceous plants in their natural state, they ought by all means to give them by degrees worse and worse soil.—Flos *plenus*. A full flower is that where the petals have become so numerous as to exclude both stamens and style altogether. As such flowers want the necessary organs of impregnation, they will never be able to produce seeds. The full and double flower both originate from too great richness of soil. A number of vessels become stuffed with nourishing sap, in such a manner, that the petals and stamens split, and are changed into more petals. Some flowers are so full that the calix bursts. Monopetalous flowers are rarely full; such as, Primula, Hyacinthus, Datura, Polyanthes. Polypetalous plants are oftener full; as, Pyrus, Prunus, Rosa, Fragaria, Ranunculus, Caltha, Anemone, Aquilegia, Papaver or Pœonia, and many others. Dianthus *caryophyllus*, and Papaver *somniferum*, have been brought forward as fair instances to prove that full flowers may produce seeds. But this proceeds from confounding a full flower with a double one. The last may bear seeds, but a full flower never. Flowers which have nectaries in form of a spur or a cup, usually increase the spur or cup, and lose the petals altogether, or they retain the last in their natural situation; or, they lose sometimes the spur or cup, and enlarge only the petals. Of the first kind, Aquilegia *vulgaris*, and Narcissus *pseudo-narcissus*, may serve as instances. In the Aquilegia the petals are dislodged, and the spur only increased in number: in this case, then, many spurs are enclosed in one another like so many cornets. In Narcissus the petals remain natural, but the nectarium is multiplied. The same plants likewise present instances of the second kind; in Aquilegia, the spurs are in this case entirely wanting, and the petals increase in number; in the same way Narcissus may sometimes want the nectarium, and the petals become full. The Violet and the Larkspur become full in the same manner. Flowers which have one or a few stamens only, are seldom full: when they are full, and this is exceedingly rare, it is only in such plants as have a monopetalous corol. As an instance of this kind, I shall mention Jasminum *sambac*. Some of the natural families never yet produced any double or full flowers. Such are, Palmæ, Calmariæ, Gramina, Apetalæ, (flowers without petals,) Amentaceæ, Coniferæ, Tripetaloidæ, Orchideæ, Scitamineæ, Oleraceæ, Inundatæ, Bicornes, Tricoccæ, Stellatæ, Umbellatæ, Asperifoliæ, Verticillatæ. Some of the last, however, afford an exception. In those flowers which are styled Personatæ, it has been only observed in the species Antirrhinum. The papilionaceæ, have been found full in a few instances only; as in Coronilla, Anthyllis, Clitoria, Spartium. Full flowers, as we have just now mentioned, occur most frequently in polypetalous corols, but the monopetalous are sometimes seen full, though this was formerly denied; as instances, are Colchicum, Crocus, Hyacinthus, Polyanthes, Convallaria, and Polygonatum. The polypetalous corol becomes full by its petals, the monopetalous by its laciniæ. Full flowers are somewhat of the appearance of compound flowers, and consequently may be mistaken by the student for such; but they are easily distinguished by the following marks:—1. In the centre of a full flower, remnants of the style are still to be seen. 2. Each petal is not furnished with stamens or a style. 3. After they have blossomed, nothing remains, and no fruit whatever can be traced. 4. Lastly, no common receptacle is to be found. Compound flowers become full in a peculiar manner. *Flores semifloseulosi*, when they grow mature, have a very long germen, and a pappus which is as long again as the germen. The linguiform corol, style, and stamens, are natural, but the stigma is divided, and of the same length with the corol. Such deformities occur in Scorzonera, Lapsana, and Tragopogon. By these characters, and by their never bearing ripe seeds, they may be distinguished from natural semifloscular flowers.—*Flores radiati*. Radiate flowers grow full in a twofold manner, either by the disk or centre, or by the rays. If the disk is full, it suppresses the radii altogether, and the tubular corols grow longer, so as to get almost a club-shaped form, and in this case the stamens are entirely lost; for example, Matricaria, Bellis, Tagetes, &c. In the same manner, likewise, compound flowers become full, which naturally consist of tubular florets; for instance, Carduus. From natural flowers of the same external appearance, full flowers may be easily distinguished by the longer corol, and by the want of seeds. If the radius is full, then no disk can be seen, and such a flower gets much of the appearance of the flos semifloseulosus, from which, however, it may be distinguished at once, by there being not the least appearance of stamens. From this simple full flower, the full compound flower differs in this point, that there is a style attached to each petal. The radius of a simple radiate flower remains the same in a full

radiate flower. If the radius be beset with prolific female flowers, then the full flower, consisting of mere linguiform flowers, is provided with prolific styles, and may without difficulty, if there be any natural plants in its neighbourhood, come to bear ripe seeds. If the radius, on the contrary, consists of barren female flowers, we commonly find them to be the same in the full flower.—Flos *difformis*, the difformed flower, is not a full, but a barren flower, which in its appearance is unlike the natural plant. It occurs most commonly in monopetalous flowers. Some of the labiate and ringent plants especially, belong to this kind; for instance, Ajuga, Mimulus, and Antirrhinum. They grow sometimes longer than usual, assume the form of egg-shaped corols, which are narrower at the top, and divided into four lobes: several long spurs are protruded from their base, which in these flowers are distinguished by the particular name of *Peloria*. The Antirrhinum *linaria* very often affords this variety. Another species of difformed flower is the Snowball, Viburnum *opulus*. This shrub has, in its natural state, small campanulate flowers, which on their margin are surrounded by large, unfertile, and rotate flowers. In gardens and in rich soil, all the flowers grow into large rotate corols, which are three times the size of the natural corols. All the stamens and styles vanish of course. Another kind of difformed flower has been observed, though extremely rare. In one of the Umbellatæ, just beneath the umbella, a compound flower was found resembling that of Bellis *perennis*. A flower like this was found by Gesner on a Ranunculus. It is singular to find on the stem of a flowering Ranunculus and of an Umbella, the flower of the Bellis. Once it was thought, that the stems of both were grown together, and that the stem of the Bellis had grown and unfolded itself in the first like a grafted sprig. But late observations have shewn, that this flower is not the perfect flower of the Bellis *perennis*, but merely a congeries of many flowers of the Ranunculus or Umbella, imperfectly unfolded, which have retained their small size and yellow colour, and are enclosed in a number of whitish petals. Perhaps the bite of insects produces this deformity.—Flos *prolifer*. A proliferous flower is one flower contained within another. This mostly occurs in full flowers. They are of a double kind; first, in simple and in compound flowers. In simple flowers, a stem rises from the pistil, which buds and flowers. This stem is scarcely ever covered with leaves, and seldom more than one flower grows from another. Instances of this kind are, the Pinclove, the Ranunculus, Anemone, Roses, the Geum *rivale*, and Cardamine *pratensis*. The deformity, however, is of a different kind in compound flowers; for in them a number of stems rise from the receptacle, which all bear flowers. Instances of this deformity are, Scabiosa, Bellis, Calendula, and Hieracium. In the Umbellatæ, something similar has likewise been observed, to wit, one umbel growing out of the other, or, what I once myself saw in Heracleum *sphondylium*, the tall stem had on its extreme points green leaves and small umbels. Proliferous flowers are a great curiosity, but they never have perfect seeds. I saw it only once in a lemon, on the apex of which a stem rose with another lemon. I doubt indeed if there be any proliferous fruits, the lemon excepted. In such fruits, however, when the common receptacle grows larger, an appearance like that of proliferous fruits is often met with. I have repeatedly observed, in the Pinus *larix*, a proliferous strobilus. I have even seen a strobilus which produced a sprig, on which other strobili were formed. In the same manner proliferous spikes are formed in rich soil, in Secale *cereale*, Phleum *pratense*, Alopecurus *pratensis*, and the like.—A very remarkable monstrosity in the germen is, the *Clavus* in grain. The seed becomes swelled three times its usual size and thickness, but has no corcle. The clavus arises in the species of corn and gramina from an unknown cause, by a stagnation of the adducent and air vessels. There are two distinct species of it: 1. The simple clavus, which is of a pale violet colour, in its interior is whitish and mealy, without any smell or taste, and may be ground along with the sound grain, without any bad effects on the last. 2. The malignant clavus, which is dark violet, blue, or blackish, internally has a blueish-gray colour, a fœtid smell, and a sharp pungent taste. Its meal is tenacious, imbibes warm water slowly, and has no slimy appearance when kneaded. The bread has a violet blue colour. When eaten, cramps, and especially the raphinia of Cullen, are produced by it.

"*Sterilitas*. We call plants sterile or barren, when they produce neither flowers nor fruits. All full, deformed, and proliferous flowers, therefore, are sterile, because the stamens and pistil suffer in them. But some plants are sterile only as far as they do not produce blossoms. The cause of this may be climate, too much sap, improper soils, and ill treatment. Plants, which are transplanted from a warmer climate into a colder, bloom very rarely. An artificial degree of heat, like their natural, is therefore frequently tried, but not always with good effect. The plants from the Cape of Good Hope require more warmth in winter than in summer, and, if they have this, are sure to blossom. Fruit-trees, when they have too much sap, and their outer bark is too thick, have only a thin vascular ring annually formed; the sap therefore must ascend towards the top and the boughs, and fruit-trees of that kind grow often without ever having blossoms. Gardeners try to remedy this, by lopping some boughs, cutting off part of the root, and by removing the plant to a sterile soil; but they are, notwithstanding all these precautions, often disappointed. The best and easiest method is to bleed or scarify such trees, as it has been called, or to scratch superficially, and in a winding direction, their stem and principal branches. The vascular rings are then at freedom to expand, and the tree will bloom and bear fruits without delay, as the circulation of the sap does not now go on with equal rapidity as before. Improper soil promotes sterility. If succulent plants, for instance, Cactus, or Mesembryanthemum, be placed in rich garden earth, they may grow in it, but scarcely ever, at least very rarely, bear blossoms. Are they, however, placed in a ground mixed with loam and sand, then they will easily shew their blossoms, if they are rightly treated. Ill treatment indeed suppresses in many a plant the approaching flower. Amaryllis *formosissima*, if kept constantly in pots filled with garden earth, produces many leaves, but no flowers. But, if its bulb be taken out and preserved in a dry place, out of ground, during the winter, a flower will appear every year. Many other bulbous plants, which grow in sandy plains in warm climates, do the same. Many examples might here be adduced, which for the sake of space I am forced to omit.—*Abortus*. When flowering plants, which are provided with perfect female organs of generation, do not bear fruit. This originates from a want of male organs of generation, their bad structure, want of the impregnating insects, the heat of moisture and soil, sting of insects, and violent storms, various disorders, too great age, and too much sap; or, lastly, when the flower appears at an unfavourable season. Every botanic garden can shew us numberless instances of abortion. How often do we lose exotic plants, bearing no seeds, because the male organs are either wanting, or in an imperfect state! How often might insects, could we obtain proper species, do this office! In this case, a great deal may be done by the gardener. If there

is not sufficient warmth, which if required, to ripen many foreign fruits, they must necessarily drop off in its immature state. Drought and sterile soil not unfrequently deprive us of the fruit which we expected. Careful watering may assist us here greatly. The larvæ of various insects, and often these themselves, when perfect, rot and destroy the fruit. Winds, old age, and accidents, often disappoint our hopes of gathering fruit. Here no remedies are of avail, except avoiding the occasional causes. From too great a quantity of sap, many a fruit-tree throws off its fruits. This happens from the same cause that plants do not blossom for superabundance of sap; and the means above recommended in that case may serve us here as well. Most bulbous plants, when the sap accumulates, drop their immature fruit: they should therefore be planted in dry ground. Some bulbous plants indeed only then ripen their seeds, if their unripe fruit be cut off with the stem, and kept thus lying for some time. If a plant which requires particularly fresh air and insects, blossom in the middle of winter, or, to speak more generally, in a cold season, fruit will seldom be produced. In this case, nothing can be done, unless, indeed, by some artificial mode of treatment, the plant be made to blossom again in spring and summer."—See *Blights.*

Platanus; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flowers,* compound, forming a globular ament. *Calix:* a very few small jags. *Corolla:* scarcely apparent. *Stamina:* filamenta oblong, thicker at top, coloured; antheræ four-cornered, growing round the filamentum at the lower part. *Female Flowers,* forming a globe, numerous, on the same tree. *Calix:* scales many, very small. *Corolla:* petals many, concave, oblong, club-shaped. *Pistil:* germina many, awl-shaped, ending in awl-shaped styles, with a recurved stigma. *Pericarp:* none; fruits many, collected into a globe. *Seed:* roundish, placed on a bristle-shaped peduncle, and terminated by the awl-shaped style; with a capillary pappus adhering to the base of the seed. Essential Character. *Male. Calix:* ament globular. *Corolla:* scarcely apparent. *Antheræ:* growing round the filamentum. *Female. Calix:* ament globular. *Corolla:* many-petalled. *Stigma:* recurved. *Seeds:* roundish, mucronate with the style, pappose at the base.——The species are,

1. Platanus Orientalis; *Oriental Plane Tree.* Leaves subpalmate, five-lobed; nerves smoothish underneath. This is a native of Asia, where it becomes very large. The stem is tall, erect, and covered with a smooth bark, which annually falls off; it sends out many side-branches, which are generally a little crooked at their joints. The flowers come out upon long peduncles hanging downwards, each sustaining five or six round balls of flowers; the upper, which are the largest, are more than four inches in circumference; they sit very close to the peduncle. The flowers are so small as to be scarcely distinguished without glasses; they come out a little before the leaves, which appear at the beginning of June: and in warm summers the seeds will ripen late in autumn, and if left upon the trees will remain till spring, when the balls fall to pieces, and the bristly down which surrounds the seeds helps to transport them to a great distance with the wind.—There are several varieties; two of which are, the *Maple-leaved Plane,* and the *Spanish Plane-tree:* the first has heart-shaped leaves, five-lobed, smooth, distant toothed, abrupt and three-ribbed at the base; the second, leaves three or five lobed, toothed, wedge-shaped and elongated at the base, triple-ribbed, nearly smooth. The Plane-tree has always been much esteemed in the eastern countries, where it grows naturally, for its beauty and grateful shade. Pausanius tells us of a Plane-tree of extraordinary size and beauty in Arcadia, supposed to be planted by Menelaus; so that the age of the tree when he saw it must have been about thirteen hundred years. That this tree was large and handsome, we can easily believe; but the age is incredible, especially allowing the tree to be sound when seen by Pausanias. Pliny mentions one in Lycia that had mouldered away into an immense cave, eighty feet in circumference. Caligula also had a tree of this sort, at his villa near Velitræ: the hollow of the trunk held fifteen persons at dinner, with a proper suite of attendants. Evelyn, Miller, and Gilpin, have related at length from Ælian, the adoration that was paid by Xerxes to a tree of this sort in Phrygia. And wherever any sumptuous buildings were erected in that country, the porticoes which opened to the air generally terminated in groves or lines of these trees. It was no less esteemed in Italy, after it was introduced there; and Pliny informs us that it was first brought over the Ionian sea into the island of Diomedes, for a monument to that hero: thence it passed into Sicily, and then into Italy. The same ancient author asserts, that there is no tree whatsoever which so well defends us from the heat of the sun in summer, or that admits it more kindly in winter; the branches being produced at a distance proportioned to the largeness of the leaves, so that when the leaves are fallen in winter, the branches easily admit the rays of the sun. Lady Craven mentions some Plane-trees which she saw in the Turkish dominions, of a size so gigantic, that the largest trees we have in England would have appeared like besom-sticks in comparison. It is generally supposed that this tree was introduced into England by the great Lord Chancellor Bacon, who planted a good many of them at Verulam, where they were flourishing in 1706, but were destroyed a few years back. The Turks used to build most of their ships with this timber, which is hard, close, takes a fine polish, and is valuable for a variety of useful purposes. In Great Britain it is merely considered as an ornamental tree, and is even less common than the next species in our plantations. Notwithstanding its backwardness in coming out in the spring, and the sudden decay of its leaves in autumn, yet for its handsome appearance, and the great size to which it will grow, it deserves a place in all large plantations, especially near mansions, or on a moist soil, and near streams of water, in which situations it will arrive at a prodigious magnitude.—*Culture.* This species is propagated either from seeds or by layers, the latter of which is generally practised in England; though the plants thus raised seldom make such straight trees as those which are produced from seeds. It has however been generally thought, that the seeds of this tree were not productive, merely because they have not been sown at a proper season, nor managed rightly. Mr. Miller saw thousands of the young plants spring up from the seeds of a large tree, which were scattered upon the ground in a moist place; and found that if the seeds are sown soon after they are ripe, in a moist shady situation, they will rise extremely well; and the plants thus obtained will make a considerable progress after the second year, being much hardier, and less liable to lose their tops in winter, than those which are propagated by layers. And as the seeds often ripen in England, they may be propagated in as great abundance as any other forest tree. See the next species.

2. Platanus Occindetalis; *Western* or *American Plane Tree.* Leaves with five angles, slightly lobed, toothed, wedge-shaped at the base; nerves tomentose underneath. Stems straight, and of equal girth in most parts of the length. The branches extend wide on every side. The young ones have

a brownish, the old ones a gray bark, which is smooth, and falls off annually like that of the first species. The foot-stalks of the leaves are three inches long. The colour of the leaves is a light green on their upper side, and pale on their under. The flowers grow in round balls like the former species, but are smaller: the leaves and flowers of both appear at the same time; and the seeds ripen in autumn. Kalm calls it the Virginian Maple, and says that it grows in plenty on the shores of the Delaware. The Anglo-Americans call it *Button Wood*, from its catkins or aments; though *Water Beech* is a more common name. It grows mostly in low places, but especially on the edges of rivers and brooks, and is easily transplanted to drier places if the soil be good; and as the leaves are large, and the foliage thick, it is planted about houses and gardens, to afford shade in the hot season. It grows also in marshes and swampy fields, with the Ash and Red Maple; and is remarkable for its quick growth, being frequently as tall and thick as the best Fir-trees. There are such numbers of them on the low meadows between Philadelphia and the ferry at Gloucester, on both sides of the road, that in summer it is a shady walk all the way: and in Philadelphia itself, near the Swedish church, some large trees of it stand on the shore of the river. In more than a century and half since its importation, it has not become very common, although, as Mr. Marshall observes, it is particularly refreshing to the eye, and truly ornamental; the bright colour giving variety to groves and masses of wood, and in single trees or groups being singularly elegant. Mr. Gilpin remarks, that its stem is very picturesque; it is smooth, and of a light ash-colour; has the property of throwing off its bark in scales, thus naturally cleansing itself, at least its larger boughs, from moss and other parasitical incumbrances. No tree forms a more pleasing shade: it is full-leafed, and its leaf is large, smooth, of a fine texture, and seldom injured by insects. Its lower branches shooting horizontally, soon take a direction to the ground; and the sprays, by twisting about in various forms, fill up every little vacuity of shade. At the same time, it must be confessed that the twisting of its branches is a disadvantage, when the tree is stripped of its leaves and reduced to a skeleton. Nor indeed does its foliage, from the largeness of the leaf, and the mode of its growth, make the most picturesque appearance in summer. The summer leaf, both of this and the preceding species, bear so light a hue as to mix ill with the foliage of the Oak, the Elm, and other trees. On the skirts of a plantation they sometimes form a disagreeable spot during summer; but in autumn their leaves receive a mellow tint, which harmonizes well with the waning colour of the wood. One of the finest occidental Planes, adds Mr. Gilpin, stands in my own garden at Vicar's hill, where its boughs feathering to the ground, form a canopy of above fifty feet in diameter.—*Culture:* This tree will grow extremely well from cuttings, if they are planted at the beginning of October upon a moist soil, and if watered in dry weather, will make prodigious progress; so that in a few years after planting they will afford noble trees for avenues and shady walks. Both this and the preceding species may be easily propagated in March by layers. Every twig will take root, if they be only pegged down, and covered with earth; and the layers will be well rooted in one year: then they should be cut off from the old trees or stools, and planted in a nursery, where they may remain two or three years to acquire strength, and should then be transplanted where they are to remain; for the younger they are when finally planted, the better they will thrive. The best time for sowing the seeds is autumn, upon a somewhat lightish mellow soil. In the winter, screen the seed-bed with pea-straw, or some other light covering, that can easily be removed in mild weather. In the spring, before the seeds vegetate, rake the beds gently over with a short-toothed rake, sifting a little fresh rich mould on them, and water them during dry weather in summer. In the following autumn, the beds having been made quite clean, put a little more good mould about the plants; after which they will require no trouble but keeping them clean till they have had another season's growth; when they may be removed into the nursery in spring, in rows one yard asunder, and eighteen inches distance in the rows. Observe, in propagating them by seed, though many will come up in the first spring, the general crop must not be expected till the second. Dr. Hunter recommends the cuttings to be taken from strong young wood, and planted early in autumn in a moist good mould. They are generally planted thick, and then removed into the nursery; but if a large piece of moist ground be ready, the cuttings may be placed at such a distance as not to approach too near each other before they are of a sufficient size to plant where they are to remain, which would save the expense and trouble of a removal. Mr. Boutcher recommends the cuttings to be planted at the beginning of March, in shady borders two feet row from row, and eight or ten inches in the rows: if they are torn asunder at the joints, with a knob of the old wood left, they will grow more readily. These cuttings should be a foot or fourteen inches long, and buried about eight inches deep. In two years they may be removed. In short, however these beautiful trees are propagated, after two years they may be planted out, in rows three feet and a half asunder, there to remain, or to be transplanted after three years to another nursery, in rows six feet asunder, and three feet in the rows, where they may stand six or seven years. The season for transplanting them is March, and they delight in a moist ground, particularly the second species; so that where the land is dry, the two varieties mentioned under the first species are to be preferred.

Platylobium; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* bell-shaped, five-toothed; the three lower teeth acute and spreading, the two upper very large, obovate, obtuse, close pressed to the standard. *Corolla:* papilionaceous; standard heart-shaped, twice as long as the calix, spreading, deeply emarginate; wings shorter than the standard, semi-obovate, with a blunt incurved tooth on the upper side at their base; keel of two adhering petals, obtuse, as long as the wings, with a tooth on each side of the base, embraced by the incurved teeth of the wings. *Stamina:* filamenta ten, in one set, separated only on the upper side, and cloven nearly half their length; divisions equal, and curved upwards; antheræ nearly orbicular, equal, versatile. *Pistil:* germen linear, very hairy; style recurved, smooth; stigma simple, sharp. *Pericarp:* legume pedicelled, clothed with scattered hairs, somewhat cimeter-shaped, perfectly compressed, obtuse, with a small point, one-celled, extending into a flat border along the upper edge, considerably beyond the insertion of the seeds. *Seeds:* seven or eight, compressed, each on a curved white stalk. Essential Character. *Calix:* bell-shaped, five-cleft, the two upper segments very large and obtuse; legume pedicelled, compressed, winged at the back.——The species are,

1. Platylobium Formosum; *Orange Flat-pea.* Leaves ovate, somewhat heart-shaped; germen all over hairy; stalk of the legume shorter than the calix; bractes silky. Stem shrubby, four feet high; branches opposite, round, roughish, covered with leaves, and ornamented with numerous

flowers; leaves opposite, on very short hairy stalks, of a beautiful green, glaucous beneath; flowers solitary, from the axils of the uppermost leaves, opposite, on short hairy peduncles; standard of the corolla orange-coloured, striated almost half way to the edge, with beautifully radiant crimson lines, from a pale yellow spot at the base; wings deep yellow; keel whitish, tipped with a rich crimson; pod an inch and half long, and half as broad.—Native of New South Wales, where it blooms all the year.

2. Platylobium Parviflorum; *Small-flowered Flat-pea.* Leaves ovate-lanceolate; germen nearly smooth; stalk of the legume longer than the calix; bractes smooth.—Native of New South Wales.

3. Platylobium Triangulare; *Triangular-leaved Flat-pea.* Leaves somewhat triangular or hastate, with spinous angles; flower-stalks bracted at the base and summit, naked in the middle; legume several times longer than the calix.—Found in Van Diemen's land.

Plectranthus; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, subcampanulate, short, two-lipped; upper lip ovate, wider, ascending; lower lip four-cleft, acute, the two lowest segments a little longer. *Corolla:* one-petalled, ringent, resupine; tube compressed, longer than the calix. One lip turned upwards, wide, trifid; the middle segment larger, emarginate; the lateral ones small: the other lip turned down, narrower, entire, ovate, acute, concave. Nectary a spur or bump from the base of the tube of the corolla, produced upwards. *Stamina:* filamenta four, declined, awl-shaped, of which two are a little shorter; antheræ simple. *Pistil:* germen four-parted; style filiform, the length and situation of the stamina; stigma bifid, acute. *Pericarp:* none; but the calix contains the seeds at bottom. *Seeds:* four, roundish. Essential Character. *Calix:* upper segment large. *Corolla:* resupine; gibbous or spurred at the base. *Filamenta:* simple.——The species are,

1. Plectranthus Fruticosus; *Shrubby Plectranthus.* Nectary spurred; racemes compound; peduncles three-parted; stems shrubby, levigated, several, erect, very much branched, brachiate, pithy, ash-coloured; branches opposite, spreading, obscurely marked with lines the thickness of a reed, brittle; tender shoots four-cornered, pubescent, green; leaves broad, ovate, or shaped like a heart, only they are not emarginate, but produced at the base, acute or acuminate, doubly serrate, with equal, bluntish, waved serratures, wrinkled, nerved, and veined, with the nerves and veins prominent on the lower surface only, villose, appearing dotted underneath when viewed with a magnifying glass, spreading, fragrant, four or five inches long, and three or four wide; flowers pedicelled; corollas blue, five lines in length. It flowers from June to September.—Native of the Cape of Good Hope. It perfects seeds in England, and may be propagated by them, or by cuttings, but must have the protection of the dry-stove.

2. Plectranthus Punctatus; *Dotted Plectranthus.* Nectary gibbous; flowers in spikes. Stem herbaceous, rough-haired; leaves ovate, acute, toothed, nerved, very much wrinkled, villose, commonly spotted with brown in the disk, the spot having stiffish brown hairs scattered over it, spreading, reclining, from two to three inches long, from eighteen to twenty-four lines wide, stinking; spikes solitary, terminating; and besides this, others short and solitary from the upper axils, erect, compact, bracted, hirsute, two inches long; flowers on short pedicels, in a sort of whorl, aggregate under each bracte, two or three lines in length; corollas very pale blue, marked with purple lines on the disk of the upper lip; on the lower more intensely dotted towards the tip; seeds compressed, of an ash-bay colour. It flowers from January to May.—Native of Africa. This generally ripens its seeds, and can be propagated only by them. It may be preserved in the dry-stove or green-house.

3. Plectranthus Galeatus; *Helmet-flowered Plectranthus.* Nectary gibbous; pedicels branched; leaves cordate-ovate, acuminate, serrate. Stem villose, grooved; peduncle terminating; pedicels opposite, branched; bractes none; corollas pubescent, with the lower lip galeated.—Native of Java.

4. Plectranthus Forskohlæi. Nectary gibbous; racemes leafless; stem equal; leaves ovate, approximating towards the top of the branches, hairy, very blunt, grossly crenate, transverse at the base, quite entire; corolla four times as long as the calix, pale purple.—Native of the mountains of Arabia Felix and Madagascar.

5. Plectranthus Crassifolius; *Thick-leaved Plectranthus.* Nectary gibbous; racemes bracted; leaves ovate, fleshy.—Native of Arabia Felix.

Plectronia: a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, obsoletely five-toothed, closed with sinuses, or five villose scales, permanent. *Corolla:* petals five, lanceolate, sessile, inserted into the throat of the calix. *Stamina:* filamenta five, very short; antheræ two-lobed, roundish, each covered with the calicine scales. *Pistil:* germen inferior; style filiform, shorter than the calix; stigma ovate. *Pericarp:* berry oblong, two-celled. *Seeds:* solitary, oblong, compressed. Essential Character. *Petals:* five, inserted into the throat of the calix. *Berry:* two-seeded, inferior.——The only known species is,

1. Plectronia Ventosa. Leaves opposite, petioled, lanceolate-ovate, quite entire, even, longer than the internodes; corymbs capillary, brachiate, shorter than the leaves. It is a tree, with four-cornered branches.—Native of the Cape.

Pliant Mealy Tree. See *Viburnum.*

Plinia; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five or four parted; segments acute, flat, small. *Corolla:* four or five petalled; petals ovate, concave, widely spreading. *Stamina:* filamenta numerous, inserted into the calix, capillary, the length of the corolla; antheræ small. *Pistil:* germen superior, small; style awl-shaped, longer than the stamina; stigma simple. *Pericarp:* drupe very large, globular, grooved. *Seed:* single, very large, globular, smooth. Essential Character. *Calix:* four or five parted. *Petals:* four or five. *Drupe:* superior, grooved.——The species are,

1. Plinia Crocea; *Saffron-fruited Plinia.* Flowers five-petalled; leaves abruptly pinnate; fruit eatable.—Native of America.

2. Plinia Pedunculata; *Red-fruited Plinia.* Flowers four-petalled; leaves opposite, petioled, simple, even, like those of Myrtle, ovate; berry roundish, the size of a plum: in this species it is inferior. It flowers in January and February, and is commonly cultivated in Madeira and the East Indies.—It is the same with *Myrtus Brasiliana* and *Eugenia Uniflora*, which see.

Plocama; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, very small, five-toothed, permanent. *Corolla:* one-petalled, bell-shaped, five-parted; segments oblong. *Stamina:* filamenta five, short, inserted into the tube; antheræ linear, from incumbent erect. *Pistil:* germen inferior, globular; style filiform, subclavate, longer than the stamina; stigma simple, obtuse. *Pericarp:* berry subglobular, three-

celled. *Seeds:* solitary, linear-oblong. Essential Character. *Calix:* five-toothed, superior. *Corolla:* bell-shaped, five-cleft. *Berry:* three-celled. *Seeds:* solitary, linear-oblong.——The only known species is,

1. Plocama Pendula; *Pendulous Plocama.*—Native of the Canary Islands.

Ploughman's Spikenard. See *Baccharis* and *Conyza.*

Plukenetia; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male. Calix:* perianth of one leaf, in four deep ovate-acute, equal, spreading segments. *Corolla:* none. *Stamina:* filaments numerous, united in an imbricated manner, awl-shaped, very short; anthers small, smooth, of two tumid furrowed lobes. *Female,* on the same plant. *Calix:* perianth inferior, of one leaf, in four deep, ovato-lanceolate, acute, equal, spreading, permanent segments. *Corolla:* none. *Pistil:* germen superior, four-lobed, depressed, smooth; style very long, cylindrical, declining, four-cleft at the summit; stigmas four, capitate, globose. *Pericarp:* capsule four-lobed, coated, depressed, smooth, with dilated angles, of four cells, and eight elastic valves. *Seeds:* solitary, large, compressed, with veiny wrinkles. Essential Character. *Male. Calix:* in four deep segments. *Corolla:* none. *Stamens:* numerous. *Female. Calix* and *Corolla,* as in the male. *Germen:* superior. *Style:* simple. *Stigmas:* four, capitate. *Capsule:* four-lobed. *Cells:* elastic, with solitary seeds.——The species are,

1 Plukenetia Volubilis; *Twining Plukenetia.* Angles of the capsule compressed, keeled. All the flowers are green, and more singular than beautiful. Fruit the size of a small walnut.—Native of the West Indies.

2. Plukenetia Verrucosa; *Warty Plukenetia.* Angles of the capsules terminated by two tubercles.—Native of Surinam.

3. Plukenetia Corniculata; *Horned Plukenetia.* Angles of the capsules compressed, tapering, pointed.—Found in the woods of Amboyna, where it is known by the name of *Utta Bela.*

Plum-tree. See *Prunus.*

Plum, Maiden. See *Camocladia.*

Plumbago; a genus ot the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, ovate-oblong, tubular, five-cornered, rugged, with a five-toothed mouth, permanent. *Corolla:* one-petalled, funnel-form: tube cylindrical, narrower at top, longer than the calix; border five-cleft, from erect spreading, with ovate segments; nectary of five very small acuminate valves, in the bottom of the corolla, enclosing the germen. *Stamina:* filamenta five, awl-shaped, free within the tube of the corolla, placed on the valves of the nectary; antherœ small, oblong, versatile. *Pistil:* germen ovate, very small; style simple, the length of the tube; stigma five-cleft, slender. *Pericarp:* capsule oblong, five-cornered, terminated by the permanent style, one-celled, five-valved, clothed with the calix. *Seed:* single, oblong, fastened to a thread, pendulous. Essential Character. *Corolla:* funnel-form. *Stamina:* inserted into scales, enclosing the base of the corolla. *Stigmas:* five-cleft. *Seed:* one, oblong, truncated.——The species are,

1. Plumbago Europæa; *European Leadwort.* Leaves embracing, lanceolate, rugged. Root perennial, striking deep into the ground; stalks many, slender, three feet and a half high, and channelled; colour of the leaves grayish. The upper part of the stalks send out many slender side-branches, which have small leaves on them: these, and also the principal stalks, are terminated by tufts of either blue or white flowers, which are small, and succeeded by rough hairy seeds. It seldom flowers in England till towards the end of October, and, unless the autumn proves warm, does not flower at all; and never produces ripe seeds. It is called Dentellaria in Latin, Dontellaire in French, and in English Toothwort, from its property of curing the tooth-ach; being of a hot caustic nature, like Pellitory of Spain.—Native of the south of Europe, and of Tunis in Africa. Two ounces of the plant, boiled in four ounces of Olive oil, is recommended to cure the itch: the sediment is tied up in a bag of linen, and the patient is rubbed with it, moistening the outside of the bag from time to time with the same oil. Allioni says, that the leaves are too burning and inflammatory; and therefore prefers an infusion of the root, which he prescribed successfully. The bruised root is laid on the wrist, to heal the tooth-ach: it leaves a dark lead-coloured mark on the place, which being very difficult to wipe off, it has from that circumstance obtained the name of *Plumbago,* or Leadwort. So acrid is the juice, that if suffered to remain long, it will destroy the skin and leave an ulcer. Some apply it behind the ear, where it acts as a blister; but this is not a very safe mode of proceeding. Hill says, the dried root is very hot and biting to the taste, and, being held in the mouth, excites a plentiful discharge of humours, and is frequently found an almost instantaneous cure for the head-ach. It likewise eases the tooth-ach, by applying a little of it to the affected tooth.—It may be increased by parting the roots in autumn, which send out heads in plenty; these may be divided at any time when the weather is mild, from the time the stalks decay, till the roots begin to shoot in the spring. It requires a light soil and warm situation, without which it will not flower. The roots should be allowed to spread, and the stalks require support; and if the plants be kept clean from weeds, and the ground be dug between them every autumn, they require no other culture.

2. Plumbago Lapathifolia; *Dock-leaved Leadwort.* Leaves embracing, lanceolate, even; stem divaricating. This resembles the preceding, but the stem is higher, the branches longer and divaricated, the leaves much larger and smooth, and the flowers one half less.—Native of Spain.

3. Plumbago Capensis; *Cape Leadwort.* Leaves petioled, oblong, entire, glaucous underneath; stem erect.—Native of the Cape of Good Hope.

4. Plumbago Zeylanica; *Ceylon Leadwort.* Leaves petioled, ovate, smooth; stem erect, round. This is a perennial plant, with a strong fibrous root, from which arise many slender stalks, growing nearly four feet high. The upper part of the stalks divides into small branches, having smaller leaves on them, and terminating in spikes of white flowers. The upper part of the stalks also, and the calix of the flowers, are very glutinous, sticking to the fingers, and entangle small flies that settle on them. It flowers from April to November. —Native of the East Indies and the Society Isles. It is propagated by seeds, sown on a good hot-bed in the spring. The plants come up in five or six weeks. When these are fit to remove, plant each in a separate small pot filled with light loamy earth, and plunge the pots into a hot-bed of tan, observing to screen them from the sun until they have struck new root. Let them have plenty of fresh air in summer, with a moderate quantity of water every other day; but less in winter, both of air and water.

5. Plumbago Rosea; *Rose-coloured Leadwort.* Leaves petioled, ovate, smooth, somewhat toothletted; stem with gibbous joints. This is a shrubby plant, which frequently grows to the height of four or five feet, and is perpetually putting forth flowering spikes, of a pale scarlet colour; these continue a long time, and hence, with proper management, it may be kept in flower during most of the year.—Native of the East Indies.

6. Plumbago Scandens; *Climbing Leadwort.* Leaves petioled, ovate, smooth; stem flexuose, scandent; flowers terminating, subpanicled, commonly in spikes, sessile, scattered, approximating. It flowers here in July and August.—Native of South America and Jamaica, in dry hedges. Increase this by cuttings, which strike freely; it is one of the most ornamental plants which are kept in stoves.

7. Plumbago Auriculata; *Eared Leadwort.* Leaves ovate, oblong, petioled, scaly, dotted underneath; petiole eared, embracing.—Native of the East Indies.

Plumeria; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, blunt, very small. *Corolla:* one-petalled, funnel-form; tube long, widening gradually; border five-parted, from erect spreading; segments ovate-oblong, oblique. *Stamina:* filamenta five, awl-shaped, from the middle of the tube; antheræ converging. *Pistil:* germen oblong, bifid; styles scarcely any; stigma double, acuminate. *Pericarp:* follicles two, long, acuminate, ventricose, bent downwards, nodding, one-celled, one-valved. *Seeds:* numerous, oblong, inserted into a larger ovate membrane at the base, imbricate. Essential Character. *Corolla:* contorted. *Follicles:* two, reflex. *Seeds:* inserted into their proper membrane.—This genus of plants is propagated by their seeds, procured from their native countries. Sow them in pots filled with light earth, plunge them into a tan-pit; and when the plants are two inches high, transplant them separately into small pots filled with light sandy earth, and plunge them into the hot-bed again, shading them in the middle of the day, until they have taken root: they must not have much water, for being very succulent, they would rot with much moisture. In hot weather they require a large share of fresh air, which should be admitted by raising the glasses of the hot-bed daily, in proportion to the warmth of the season; this will prevent their being drawn up too weak. Towards Michaelmas, when the nights begin to be cold, the plants should be removed into the stove, and plunged into the bark-bed, where they must remain during the winter: and as at that time all these plants cast their leaves, which do not grow again till the beginning of May, they should then be watered very sparingly. They are every one too tender to endure the open air of this country, even in summer: and must therefore be kept in the stove, where in warm weather they must have a large share of free air, but in cold weather they should be kept very warm. While they are young, it will be proper to continue them in the bark-bed; but when they have obtained strength, they may be placed in a dry-stove, where they will thrive well, provided the gardener keep them in a moderate temperature of heat, and they have not too much water.—These plants may also be propagated by cuttings, which should be taken from the old plants two months before they are planted, during which time they should be laid on the flues in the stove, that the part which joined to the old plant may be healed over, before they are planted; otherwise they will rot. These cuttings should be planted in small pots, filled with light sandy earth, and plunged into a moderate hot-bed of tanner's bark, shading them from the sun in the heat of the day, and refreshing them sparingly every week or ten days with water. If the cuttings succeed, they will have taken root in about two months, when they should have a larger share of air, to harden them by degrees to bear the sun and air, and may after that be treated as the old plants. *Observe.* The milky juice of these plants is very caustic, and esteemed poisonous. In cutting off any of the branches of the plants, if the knife be not immediately cleaned, the juice will corrode it, and turn the blade almost black in a very little time, so as not to be cleaned off again: if dropped on linen, it will eat holes like aqua-fortis.——The species are,

1. Plumeria Rubra; *Red Plumeria.* Leaves ovate-oblong; petioles downy, even. In Jamaica this plant is called the Red Jasmine: it rises to the height of eighteen or twenty feet. The stalks are covered with a dark green bark, having marks where the leaves are fallen off; they are succulent, somewhat woody within, and abounding with a corrosive milky juice. Towards the top, the stalks put out a few thick succulent branches, with leaves at their ends of a light green colour, full of milky juice, having a large midrib, and many transverse veins. The flowers come out in clusters at the ends of the branches; they are shaped like those of the Oleander, are of a pale red colour, with a yellow mouth, and have an agreeable odour; they are so beautiful and sweet in South America, that the trans-atlantic ladies adorn their hair with them, and place them among their linen, as we do Lavender. Mr. Miller has a variety of this, which he calls *Plumeria Incarnata;* he received it from the island of St. Christopher by the name of Japan-tree, with an account that it had been then lately introduced from the Spanish West Indies. The stalks are lower than in the above, the leaves thicker, and the veins larger; the flowers also are paler-coloured, and in larger clusters, it being common to have upwards of twenty open in one bunch, with a number to succeed these as they decay, so that the clusters continue in beauty upwards of two months, during which time they make a most beautiful appearance in the stove, and afford a very agreeable odour.—Native of the West Indies.

2. Plumeria Alba; *White Plumeria.* Leaves lanceolate, revolute; peduncles tuberous above. This has the habit of the preceding, but is less branched, and seldom above fifteen feet high; abounding in a milky juice. The flowers are white, with a yellowish eye, and diffuse so very sweet and powerful an odour to a considerable distance, that it produces the head-ach in some constitutions. This plant is not nearly so elegant as the former, yet the beauty of its stem and leaves should introduce it into every curious collection. It grows abundantly at Campeachy, and is also found in Jamaica.

3. Plumeria Obtusa; *Blunt-leaved Plumeria.* Leaves lanceolate, petioled, blunt. This produces small white flowers resembling those of the preceding species. Loureiro describes it as a thick tree, above the middle size, with an ash-coloured smooth milky bark, a juicy brittle wood, and thick twisted branches.—It has been found in both Americas, and is probably the same plant with Rumphius's *Flos Convolutus,* which is a native of Amboyna, China, and Cochin-china, where it is also cultivated on account of the beauty and sweet smell of the flowers.

4. Plumeria Pudica; *Close-flowered Plumeria.* Border of the corolla closed; leaves oblong, flat-veined; flowers numerous, yellowish; the border erect, and shut even after they drop, being rolled up like the flowers of Hibiscus. They succeed each other continually for two months together, and have an odour much more agreeable than that of the preceding species, or even of any other known flower. It is highly esteemed at Curaçao, where it is called Douzelle, Damsel, or Virgin, because of the closing of the flowers. They cultivate it there in the gardens; but it is not known from what part of South America it was introduced. It is a milky shrub, five feet high, and of the same habit with the preceding species.

Poa; a genus of the Class Triandria, order Digynia.—Generic Character. *Calix:* glume many-flowered, two-valved, awnless, collecting the flowers into a distich ovate-oblong spikelet; valves ovate, acuminate. *Corolla:* two-valved; valves ovate, sharpish, concave, compressed, a little longer than the calix, with a scariose margin; nectary two-

leaved; leaflets acute or jagged, gibbous at the base. *Stamina:* filamenta three, capillary; antheræ forked. *Pistil:* germen roundish; styles two, reflex, villose; stigmas similar. *Pericarp:* none; corolla cleaves to the seed, and does not separate. *Seed:* single, oblong, acuminate, compressed on both sides, covered. *Observe.* Some species have a two-flowered, others a three or four flowered calix; and in some, the florets are connected at the base by a fine web of folded silky threads. ESSENTIAL CHARACTER. *Calix:* two-valved, many-flowered; spikelet ovate; valves scariose at the edge, and sharpish. —For the propagation and culture of this important genus, see *Grass, Meadow,* and *Pasture.*——The species are,

1. Poa Aquatica; *Water* or *Reed Meadow Grass.* Panicle erect, branched, loose; spikelets six-flowered, linear; florets blunt, seven-nerved. Root perennial, creeping; culms from three to six feet high, upright, leafy, the thickness of a reed straw, two-edged, striated, smooth, the joints yellowish, and these below rooting all round; leaves sword-shaped; seeds of a pale brown colour. This is one of our largest Grasses. Immense tracts of land in the fens of Lincolnshire, Cambridgeshire, and other counties, that formerly produced only useless aquatic plants, and which still, though drained by mills, retain much moisture, are now covered with this Grass, which not only affords rich pasturage in summer, but forms the chief part of their winter fodder. It has a powerfully creeping root, and bears mowing well; on the banks of the Thames it is sometimes twice cut in one season. It grows not only in very moist ground, but in the water itself, and with Cat's Tail, Burr Reed, &c. soon fills up ditches, and occasions them to require frequent cleansing. In this respect, it is a formidable plant in slow rivers, which are freed from it in the Isle of Ely by an invention called a Bear, which is an iron roller, with a number of pieces of iron, like small spades, fixed in it; this is drawn up and down the river by horses walking along the bank, and tears up the plants by the roots, which are then borne down the stream. Like several other species, this varies with viviparous flowers: they appear from July to September.—Native of most parts of Europe.

2. Poa Alpina; *Alpine Meadow Grass.* Panicle diffused; spikelets four-flowered, cordate; glumes ovate, subfalcaet, free; lower stipules very short. Root perennial, with simple elongated smooth fibres; culm a foot high, ascending, having two joints, naked at top, round, purple, shining. Dr. Smith says, that the glumes change into leaves, and at length the fructification into a bud.—It flowers in June and July; and grows wild in the mountains of Lapland, Switzerland, Silesia, Dauphiny, and Scotland.

3. Poa Laxa; *Loose Meadow Grass.* Panicle contracted, subracemed; spikelets three-flowered, pubescent at the base and on the back; calicine glumes mucronate; glumes of the corolla acute, of a dusky violet colour, with a membranaceous white margin.—Native of the mountains of Switzerland, Bohemia, and Silesia.

4. Poa Biflora; *Two-flowered Meadow Grass.* Panicle dense; calices subbiflorous, smooth; culm ascending; flowers numerous, minute.—Native of the East Indies.

5. Poa Hirta; *Rough-haired Meadow Grass.* Panicle spreading, rod-like; calices subtriflorous, angular; sheaths dotted, ciliate, as also are the leaves; keel of the calices finely serrulate.—Native of Japan.

6. Poa Trivialis; *Roughish Meadow Grass.* Panicle diffused; spikelets three-flowered; glumes lanceolate, five-nerved, connected by a villus at the base; stipules elongated. Root fibrous; culms decumbent at the base and rooting, then erect, a foot and half high, simple, round, striated, somewhat rugged, leafy, frequently purple; leaves almost erect, flaccid, sharpish, keeled, rugged, especially underneath and round the edge. Dr. Withering remarks, that the root is creeping; the whole plant rough; the height from one foot and a half to two feet or more; the panicle six or eight inches long, and three or four broad when fully expanded; the florets mostly three or four in each spikelet, but generally three. Its creeping root, and the great roughness of the culm and leaves, sufficiently distinguish it from the ninth species, to which it has otherwise some resemblance. Willdenow says, it is sufficiently distinguished by its very branching diffused panicle, and especially by the great length of the ligule or stipule. It is certainly one of our best Grasses, both for hay and pasturage: without it, it is difficult to form a good meadow. Its chief qualities are, that it produces a large quantity of sweet tender leaves, preferred by cattle to most others, and convertible into exceedingly fine hay. It is an early Grass, flowering about the middle of June. It does not bear frost so well, neither does it shoot so early in the spring, as the ninth species; but when the weather becomes warm enough to make Grasses in general shoot, this grows faster, and produces a greater crop of bottom leaves than most others. Whilst that is found chiefly in dry pastures, this principally occurs in moist meadows, or on the edges of wet ditches; it loves moisture and a sheltered situation. In wet ground it grows very tall, but in poor dry pastures it is diminutive. It is no small recomendation, says Mr. Curtis, to this Grass, that it is a principal ingredient in that uncommonly productive meadow near Salisbury, mentioned by Stillingfleet, and described in the first volume of the *Memoirs of the Bath Agricultural Society.*

7. Poa Angustifolia; *Narrow-leaved Meadow Grass.* Panicle diffused; spikelets four-flowered, pubescent; culm erect, round.—Linnæus mentions this grass as growing every where with the preceding species in Sweden and Lapland. Dr. Smith thinks it a variety of the ninth species.

8. Poa Gerardi; *Panicled Meadow Grass.* Panicle erect; spikelets three-flowered, smooth; corollas acuminate, twice as long as the calix. Culm round, smooth, straight, a foot high and more; corollas keeled, equal in length, of an elegant bay colour, large, one wider than the other. It flowers in April and May.—Native of the mountains of France, Italy, and Switzerland.

9. Poa Pratensis; *Smooth-stalked* or *Great Meadow Grass.* Panicle diffused; spikelets four-flowered; glumes lanceolate, five-nerved, connected by a villus; stipule abbreviated, blunt. Root perennial, creeping by runners, easily penetrating into the earth and crevices of walls. The late Mr. Curtis, whose attention to Grasses is well known, first accurately distinguished this from the sixth species. As they are so alike in their general appearance as not to be distintinguished without nice examination, it may be well to give his observations on them both, as a good botanical lesson. This species is smooth in every part; but the stalks, the leaves with their sheaths, and the branches of the panicle, all feel rough, if the plant be drawn downward between the thumb and finger. In the sixth species, the sheath of the leaf is flatter and more deeply flatted. Its root is simply fibrous; that of this species creeps, and sends out many white shoots. But what most plainly distinguishes them, is, that in the Pratensis the membrane at the bottom of the leaf where the sheath begins is very short and blunt; but in the Trivialis, long and pointed. This is obvious even to a common observer, and never fails, let the Grass vary ever so much in size and other respects. These Grasses differ also in the size of the spikelets, and the number of flowers contained in each; in this they are *quinqueflorous,* but *biflorous* or *triflorons* in the sixth

species. The former grows generally on walls, on dry banks, and in meadows; the Trivialis is scarcely ever found on walls, seldom on dry banks, but most frequently in moist meadows, or by the side of ditches, where it flowers the first week of June: the former appears in flower in the middle of May, and after it has once flowered, never shews an appearance of repeating it; while the Trivialis is in bloom generally during the whole of the summer. Lastly, there is a firmness in the stalk of the Pratensis, not perceivable in the Trivialis. As to the pubescence or filamentose appearance, which seems to connect the florets and calix together, and adheres to the seeds so as to cause them to hang together as if there were cobwebs among them, that is found almost equally in both species.—The foliage of this Grass begins to shoot, and to assume a beautiful verdure, very early in the spring; but its flowering-stems come at least a week later than the Meadow Fox-tail Grass. Where early pasturage is desired, it cannot be better obtained than by a combination of these two with Sweet-scented Vernal Grass; and if crop be an object, Fox-tail should predominate. The Great Meadow Grass preferring a dry situation, keeps its verdure in a continued drought better than most others: but its root is like that of *Couch-grass*, (see Triticum Repens;) and ought therefore to be carefully introduced where the meadow is not intended to be permanent. From its not throwing up any stems or bents but once in the season, together with its hardiness and verdure, it seems to be a good Grass for lawns. In dry soils the crops from this Grass yearly diminish in quantity, so as at last to be very trifling: though Dr. Withering informs us, that it constitutes a considerable part of the herbage on the rich meadows in the various parts of Somersetshire; and Mr. Swayne adds, that in meadows which have been flooded the whole winter, it flourishes so as nearly to exclude every other Grass.

10. Poa Ferruginea; *Rust-coloured Meadow Grass.* Panicle spreading, capillary; spikelets five-flowered, oblong; glumes smooth.—Native of Japan.

11. Poa Cilianensis. Panicle elongated, branched, flexuose; spikelets four-flowered, smooth. Culms grooved, smooth, brown at the knots; leaves dark green, smooth, ciliate about the sheath, two or three lines wide; peduncles mostly one-flowered, sometimes two-flowered.—Native of Italy.

12. Poa Nervata; *Five-nerved Meadow Grass.* Panicle strict; spikelets smooth, five-flowered, nerved; corollas smooth, having five raised nerves on each valve.—Native of North America.

13. Poa Trinervata; *Three-nerved Meadow Grass.* Panicle diffused; spikelets four or five flowered, very sharp, rugged; outer glume of the corolla three-nerved; inner two-nerved; root perennial. This evidently differs from all the others except the second, and may be distinguished from that by its longer culm, much wider leaves, smaller spikelets, and by its narrow very acute glumes. It flowers in June and July.—Native of Germany.

14. Poa Sudetica. Panicle from erect spreading; spikelets three-flowered, very smooth, mucronate. Culm erect, compressed; sheath of the leaves loose, aacipital; height four feet.—Native of the mountains of Silesia, and of the marshes of Hanover and Magdebourg.

15. Poa Rubens; *Red-panicled Meadow Grass.* Panicle spreading; spikelets four-flowered, or thereabouts; outer glume of the corolla five-nerved. Culm erect, compressed. This is a middle species between the two preceding: it differs from the Trinervata, which it most resembles in having shorter broader leaves, a longer ligule, a shorter paniele of a red colour, and less divaricate, the spikelets more crowded and rugged, the outer valve of the corolla five-nerved.—Perennial; and a native of Germany, in the Lower Hesse.

16. Poa Anceps. *Two-edged Meadow Grass.* Panicle diffused: spikelets five-flowered, acute, pubescent at the base; culm aneipital.—Native of New Zealand.

17. Poa Annua; *Annual Meadow Grass.* Panicle divaricate; spikelets ovate; florets somewhat remote, five-nerved, free; culm oblique, compressed. Root annual, remarkably full of fibres; herbage bright green, not glaucous; spikelets variegated with green and white, rarely reddish. It is distinguished from the sixth species by its general habit, its spreading panicle, its reclining culms, its smoothness, and a greater softness and delicacy. It differs from the ninth species by having the branches or peduncles in pairs, its panicle more thinly set, and its spikelets larger; from both those Grasses, by its inferior size, compressed culms, annual root, the property of throwing out new shoots, and having the florets and seed separate, not hanging together by cobweb-like hairs. If *Gramen*, (Grass,) says Ray, be so named *a gradiendo* or *progrediendo, i. e.* walking along, or going forward step by step, no species exemplifies the name more aptly than this, which differs very considerably from all other annual Grasses, in continaally throwing out new shoots, and producing new flowers and seeds; insomuch that if the ground be moist, a single plant will grow in this manner throughout the year, so that we generally find on the same plant young shoots and ripe seeds. In this peculiar circumstance, therefore, it resembles the tropical plants, and probably is the only one of our vegetables that affords us a specimen of their mode of growth. No Grass also is better entitled to the accurate Ray's expressive epithet of *Vulgatissimum;* for it is common to every quarter of the globe, and occurs almost every where in meadows, gardens, by the sides of paths, and on walls; flowering all the summer, and even in the winter, if the weather be mild. In open fields the panicle frequently acquires a reddish tinge. It becomes viviparous in alpine situations. In walks, pavements, and pitchings, it is one of the most troublesome weeds: in such situations, the most expeditious way of destroying it would be by pouring boiling water over it. The foliage of this Grass is tender, and grateful to cattle, but never acquires any great height; and is also liable to be killed by the winter's frost and summer's drought. Mr. Stillingfleet says, that it makes the finest of turfs; that it is called in some parts Suffolk Grass, there being whole fields of it in High Suffolk, without any mixture of other Grasses, as it is there thought to be the best grass for the dairy. May or June is the best time to gather the seed in the greatest abundance; but as a single tuft of this Grass may be divided into a vast number of plants, and as they grow with wonderful facility, an experiment, on a small scale at least, might be tried with it by transplanting it in moist weather. This species of Grass appears to be one of the first general coverings which nature has provided for earth made bare from any cause; hence it is frequent on the edges of paths, where its seeds being scattered, quickly vegetate, and the plants, not being overpowered by more luxuriant herbage, continue to flourish; this gave occasion to Mr. Stillingfleet to suppose that this Grass thrived the more for being trodden on; but this supposition is certainly incorrect.

18. Poa Flava; *Yellow Meadow Grass.* Panicle diffused; spikelets ovate, oblong, shining.—Native of Virginia.

19. Poa Barbata; *Bearded Meadow Grass.* Panicle spreading, capillary; spikelets six-flowered, oblong; glumes smooth-keeled. Root annual, in bundles of fibres; culm

simple, upright, round, smooth, a span in height; joints bearded.—Native of Japan.

20. Poa Pilosa; *Hairy Meadow Grass.* Panicle spreading, strict; primary ramifications hairy. Height fourteen and sixteen inches; branchlets or peduncles very slender.—Native of Italy about Bologna.

21. Poa Palustris; *Marsh Meadow Grass.* Panicle diffused; spikelet subtriflorous, pubescent; leaves rugged underneath. Root perennial, creeping; culm from a foot to two feet in height, sometimes, but seldom, three feet; at first decumbent, then erect, weak, round, rooting at the four or five lower joints by white capillary fibres, between the joints involved in green, white, and brownish sheaths, putting out at almost every rooting joint a lateral shoot, rendering the culm as it were dichotomous; the joints are very close near the base, but very remote in the upper part of the culm. Krocker distinguishes this from the sixth species, by its creeping dichotomous culm; its creeping root; its thinner, longer, and more diffused panicle; and its wider, longer, and rugged leaves: and from the seventh species also, by its culm and leaves; its longer, as well as wider, panicle; and larger spikelets.—Native of Denmark, Switzerland, Italy, and Germany.

22. Poa Glutinosa; *Clammy Meadow Grass.* Panicle spreading, strict; spikelets seven to nine flowered, somewhat hirsute, glutinous. Culm simple; leaves somewhat hairy; calicine valves acute, keeled, minute. Annual.—Native of Jamaica, in dry sand.

23. Poa Prolifera; *Proliferous Meadow Grass.* Panicle spreading, strict; spikelets many-flowered, (sixteen to twenty.) Culm very much branched, knobbed, proliferous at the joints, as if it were with the origin of a younger plant.—Native of the Caribbee Islands, St. Lucia and Guadaloupe.

24. Poa Amabilis; *Indian Meadow Grass.* Panicle spreading; spikelets eighteen-flowered, linear.—Native of the East Indies.

25. Poa Eragrostis; *Spreading Meadow Grass.* Panicle spreading; pedicels flexuose; spikelets serrate, ten-flowered; glumes three-nerved. A very elegant grass, with numerous stems, from one to two feet high, quite smooth. Though an annual, it throws out several inclined culms on a fibrous root, thus forming a dark green turf. When the spikelets of the upper panicle are ripe, the seeds fall immediately, and successively those of the middle and base of the culm. This quick falling of the seeds, is the reason why we may often observe the young flowers withering at the base, whilst those in the middle are in the state of full expansion, and the upper ones falling present ripe seeds, of an uncommon fineness, though accompanied by the inner glume, and often by both.—Native of Greece, Switzerland, Dauphiny, Spain, and Italy, on walls; and also of Barbary and Siberia.

26. Poa Badensis; *Baden Meadow Grass.* Panicle crowded, ovate; spikelets eleven-flowered, distich, ovate, pubescent at the base. This Grass forms a turf; culm quite simple; corollas nerveless, acute, pubescent at the base, of a dusky violet colour, with a membranaceous margin.—Native of Baden; on the rocks by the hot baths in Lower Austria; and Mansfeldt. Perennial.

27. Poa Cynosuroides; *Bipinnate Meadow Grass.* Panicle strict, pyramidal; peduncles spreading very much; spikelets hanging down, distich. Culms of the same size as those of Wheat, simple; raceme simple, a foot long, composed of alternate, quite simple, equal peduncles, longitudinally pinnate on both sides from the base to the tip.—Native of Egypt and the East Indies.

28. Poa Unioloides; *Uniola-like Meadow Grass.* Panicle almost erect; spikelets ten-flowered, or thereabouts, ovate; lower calices many-valved. This is a middle Grass, between *Poa Briza* and *Uniola*.—Native of the East Indies.

29. Poa Racemosa: *Racemed Meadow Grass.* Panicle squeezed close; spikelets ovate, nine-flowered; peduncles very short.—Native of the Cape.

30. Poa Cyperoides; *Cyperus-like Meadow Grass.* Panicles, spike glomerate; spikelets eleven-flowered. Culm branched; leaves awl-shaped.—Native of the Cape.

31. Poa Verticillata; *Whorled Meadow Grass.* Panicle spreading, capillary, flexuose; spikelets eleven-flowered, linear-subulate. Annual.—Native of Spain, where it flowers in July.

32. Poa Atrovireus. Smooth: culm erect; leaves somewhat rigid; sheath shorter than the internodes; panicles spreading; spikelets flat, linear; flowers loosely panicled; peduncles long, capillary, angular, flexuose, rough, branched, solitary, in twos or threes.—Native of Barbary.

33. Poa Abyssinica; *Smooth Upright Meadow Grass.* Panicle capillary, loose, erect; spikelets four-flowered, even, linear-lanceolate; leaves smooth, somewhat convoluted. Root annual; culm slender, a little compressed, branched, procumbent at bottom, bent in at the knots; stigmas purple: the whole plant is very smooth. It is from the grain of this plant that the common bread in Abyssinia is prepared; that made from wheat being used only by the superior ranks. The flour of the best kind of Teff is, according to Mr. Bruce, as white as that of wheat, and is very light, and easily digested; other kinds are of a browner and coarser quality; but that which grows on light ground is most esteemed. The manner of making the Teff bread is, by taking a broad earthen jar, and having made the flour into a lump with water, they put it into the jar, and let it stand at some distance from the fire until it begins to ferment or turn sour, and then bake it into cakes of a circular form, and about two feet in diameter: it is of a spungy soft quality, and a hot disagreeable sourish taste. From the same bread, by being well toasted, and infused in water for some days, is prepared the common beer of that conntry, which is called by the name of Bouza.—It flowers in August and September, and is a native of Abyssinia.

34. Poa Capillaris; *Hair-panicled Meadow Grass.* Panicle loose, spreading very much, capillary; leaves hairy. Culm very much branched, and from six inches to two feet in length, decumbent at the base, prostrate, filiform.—Common in the West Indies, Virginia, and Canada. This Grass abounds in the meadows round Montreal. It is very slender, grows very close, and succeeds even on the driest hills; but is not rich in foliage, the slender stalk only being chiefly used for hay.

35. Poa Japonica; *Japanese Meadow Grass.* Panicle spreading, capillary; spikelets seven-flowered, and leaves smooth; culm branched. It differs from the preceding species in the number of flowers, all smooth; in the smoothness of the leaves, not hairy even at the base; and in the uprightness and superior height of the culm.—Native of Japan.

36. Poa Malabarica; *Malabar Meadow Grass.* Branches of the panicle quite simple; flowers sessile or pedicelled; seeds distant; culm creeping. Native of the East Indies, in sandy ground.

37. Poa Chinensis; *Chinese Meadow Grass.* Branches of the panicle quite simple; flowers sessile; seeds imbricate. Culm erect; leaves hairy, especially at the sheaths. It varies with two, three, and four flowered calices; as well as in height.—Native of China.

38. Poa Punctata; *Dotted-flowered Meadow Grass.* Pa-

nicle diffused; spikelets twelve-flowered; flowers diaphanous, even, with a brown spot within. Culm a foot and half high, ascending, even, the thickness of a pigeon's quill, with very swelling joints, often three in number—Native of Malabar.

39. Poa Nutans; *Nodding Meadow Grass.* Panicle contracted, nodding at the top; spikelets ten-flowered; valves reversed. Culms from two to three feet high, round, erect, simple; leaves narrow, short; branches of the panicle in half whorls.—Native of Tranquebar. It is common on the borders of paddy-grounds in the East Indies.

40. Poa Tenella; *Small Meadow Grass.* Panicle oblong, capillary, somewhat whorled; flowers six together, very minute, nodding. Root annual; culms even, prostrate, branched at bottom. Not only the leaves at the throat or opening are hairy, but the whole panicle at the base of the peduncles has bundles of long white hairs, from three to sixteen in number. It flowers in July and August.—Native of the East Indies.

41. Poa Maritima; *Creeping Sea Meadow Grass.* Panicle branched, somewhat squeezed together; spikelets five-flowered; florets bluntish, roundish, obsoletely five-nerved; root creeping. Culms decumbent at the base, from six inches to a foot in height, very smooth, round, striated, leafy. Mr. Lightfoot remarks, that this is nearly related to Festuca Fluitans, and that perhaps sea water may occasion the difference: but this is an improbable opinion, because the outer and larger valve of the corolla in this plant wants the ribs, which are so strongly marked in Festuca Fluitans; the inner valve also wants the open cleft at the end; and the Flote Fescue Grass has been examined while growing in the salt marshes at Lymington, and was found to vary but little from that growing in inland places. Willdenow observes, that in the wild plant the panicle is squeezed close, narrow, and directed one way, with spikelets having from four to eight flowers; but in a garden the panicle is divaricate, and the spikelets have from five to twelve flowers. Native of Denmark, Britain, Germany, and France, on sandy coasts and in small marshes. Found also about Yarmouth; between Bristol and the Hotwells; near the canal from Droitwich to the Severn; in the meadows near Wisbeach, &c.; also in Scotland, on the isles of Oransa and Skye, and at Loch Broom in Ross-shire. It flowers in July.

42. Poa Procumbens; *Procumbent Sea Meadow Grass.* Panicle lanceolate, directed one way, squeezed close, rugged; rachis round; spikes four or five flowered; flowers bluntish, nerved. Root fibrous, forming a turf; herb glaucous; culms several, more or less prostrate, about a span long, leafy, smooth, bent at the joints. Dr. Smith says that this Grass has an annual root, though Mr. Curtis thought it perennial. In general habit it comes near to the seventeenth species, and also bears some affinity to the following species, though sufficiently distinct from them and all others. The stalks are for the most part procumbent; but this procumbence does not appear to originate in the usual way from the weakness of the stalk, but from its being bent downwards at a joint near its base; as every stem is not thus acted on, some are frequently found nearly upright: the foliage is of a glaucous hue, and, if examined with a magnifier, is found to be covered with numerous rough silvery particles. The panicle has a greater degree of rigidity than that of the seventeenth species; the spikelets are much longer, less flat, and more regularly distant from each other; and each floret is ciliated at its base. This species was found by Mr. Curtis at the foot of St. Vincent's Rocks, on the edge of the river Severn. It has since been seen in some quantity on the inundated parts of the waste ground west of the wet-dock near Clifton; and abundantly on the pier at Scarborough, within the spray of the sea. Culture produces little alteration in its appearance.—Native of sandy inundated waste ground, near the sea; in England, Holland, and Sicily.

43. Poa Rigida; *Hard Meadow Grass.* Panicle lanceolate, distich, and pointing one way, squeezed close, smooth; rachis margined; spikelets seven-flowered; flowers round, nerveless; root annual, furnished with few fibres. Dr. Withering remarks, that this may be distinguished from all the other species by the rachis or main fruit-stalk being broad on the side opposite to the direction of the branches, convex, and edged with a paler green border. Mr. Curtis observes, that in dry and barren situations the stalks sometimes are found simple, the panicle also not branched, and the spikelets, instead of containing about eight flowers, have no more than three or four; in which case some make it another species. The variation arising from an excess or scantiness of nourishment, is what most plants are subject to; and to form species upon such foundations is to multiply plants without end. A complete knowledge of a plant, and of a Grass especially, is only to be attained by observing it at the different periods of its growth in all the various situations in which it occurs. —Native of England, Holland, France, Italy, and Germany, also in Barbary, in dry, sandy, or stony places, on walls and roofs; flowering from May to August.

44. Poa Spinosa; *Thorny Meadow Grass.* Branches of the panicle alternate, compressed, spinescent; spikelets alternate, peduncled, ten-flowered; culm branched. See *Festuca Spinosa*, which is the same plant.

45. Poa Compressa; *Flat-stalked Meadow Grass.* Panicle squeezed close, directed one way; culm ascending, compressed; florets angular, connected at the base by a complicated villus. Root perennial, creeping, consisting of downy fibres, thrown out from the lowest part of the stem, which is decumbent at the base, then rises obliquely, and is upright at the top, where it is naked, at bottom it is leafy; the first or lower joints are bent, the uppermost very long; it is striated, smooth, and about a foot high, and is very much compressed; rachis from roundish flatted; and all the branchlets at first close and erect, acutely angular and rough, a little zigzag; as they flower, they spread considerably; but immediately after the discharge of the pollen they become again close pressed to the main branch, so that the upper part of the panicle looks as if it expanded first. By this mark the Grass may be known at a distance.—Native of most parts of Europe, in dry pastures; on the tops of walls that are a little covered with earth; upon house-tops; and in other very dry places; where it may be found in flower from June to September, and may be easily discriminated by its compressed stem. It can hardly be put to an agricultural use, though all cattle eat it; for it does not thrive in moist or manured ground, and there are many better Grasses for dry situations.

46. Poa Sarmentosa; *Sarmentose Meadow Grass.* Panicle squeezed close; spikelets lanceolate, ten-flowered; culm sarmentose.—Native of the Cape.

47. Poa Striata; *Striated Meadow Grass.* Panicle spreading; spikelets ovate, ten-flowered or thereabouts; culm creeping.—Native of the Cape.

48. Poa Amboinensis. Panicle squeezed close, directed one way; culm round; inner valve of the corollas linear, curved, ciliate, like the sixty-third species; from which it differs in having the cilias many times smaller, the culms depressed, and the leaves short, scarcely an inch in length.—Native of the East Indies.

49. Poa Viscosa; *Viscid Meadow Grass.* Panicle oblong,

spreading; lower spikelets three-flowered, (three to five,) upper twelve-flowered. Culms rigid, finally viscid; roots articulate, stoloniferous, producing bundles of leafy culms, a span high, and round. The culms, peduncles, pedicels, and calices, are all so clammy as to besmear the feet and legs of those who walk among this Grass, and cover them with the glumes. It fills the air with an odour of turpentine, that is not unpleasant, especially in the evening.—Found in the dry gravelly soils of Malabar.

50. Poa Nemoralis; *Wood Meadow Grass.* Panicle and leaves attenuated; spikelets lanceolate, three-flowered or thereabouts; glumes acutely obsoletely five-nerved; stipule very short, crenate. Root creeping a little; culms several, upright, a foot and half high, slender, slightly compressed, striated, smooth. There is a variety which has the appearance of the sixth or ninth species; but it is distinguished by the species being unconnated; though hairy at the base, more acute, and less nerved; and by the stipule being very short, subcrenate or ciliate; insomuch that it cannot by any means be confounded with them. It flowers in June.—Native of many parts of Europe, in woods and shady places: it is most common in the northern parts of Great Britain.

51. Poa Contracta; *Contracted Meadow Grass.* Panicle contracted; florets lanceolate, three together, naked, sessile; leaves filiform. This is a very smooth grass, two feet high and more, with a thick culm; peduncles long and strict.—Native of the East Indies.

52. Poa Filiformis; *Thread-leaved Meadow Grass.* Panicle spreading; spikelets acute, four-flowered; leaves filiform.—Native of the Cape.

53. Poa Bulbosa; *Bulbous Meadow Grass.* Panicle subflexuose; spikelets four-flowered; glumes connected by a villus; leaves serrulate; culm bulbous at the base. Root perennial, fibrous, whitish, from which arise, in clusters, a sort of bulbs involved in several whitish or brownish coats, which are the sheaths of the leaves, stretched out almost an inch in length, and producing bundles of leaves, or else the culms.—Native of Sweden, Germany, Spain, Barbary, and the Levant, in dry sandy places; with us it is found only on the sandy sea-coast, over which its little dry bulbs are blown in various directions in summer, till the rains in autumn make them vegetate, and take deep root: the plants then yield abundance of short close herbage, a welcome spring food for cattle; and flower in April and May.

54. Poa Disticha; *Double-rowed Meadow Grass.* Spikelets compressed, four-flowered, sessile, distich, spiked. This is a middle species between *Poa Cynosurus* and *Triticum.*—Native of Carinthia, Switzerland, and Italy, on the tops of the mountains.

55. Poa Bifaria; *Recurved-spiked Meadow Grass.* Spikelets sessile, distich; lower remote, erect; upper approximating, recurved. The whole of this grass is smooth.—Native of the East Indies.

56. Poa Bromoides; *Brome-like Meadow Grass.* Subspiked: spikelets lanceolate, twenty-five flowered, lower on short pedicels, upper sessile; leaves bifarious, involuted.—Supposed to be a native of Lima.

57. Poa Spicata; *Spike-panicled Meadow Grass.* Panicle spiked: flowers awl-shaped; florets remote. Culms several, ascending from the base, a hand in height, covered on every side with the sheaths of the leaves. It has the habit of a Festuca.—Native of Portugal.

58. Poa Distans; *Reflexed Meadow Grass.* Panicle branched, effused; branches finally reflexed; spikelets five-flowered; florets very blunt, obsoletely five-nerved, shining. Root perennial, fibrous; culms several, decumbent at the base, about a foot high, (Curtis says, a foot and half; and Withering, only from nine to twelve inches,) round, leafy, striated, smooth. Though at first sight this Grass bears a near resemblance to the seventeenth species, and no doubt is often taken for that, it is, however, considerably taller; its leaves are narrower in proportion, and much more glaucous; its spikelets also are much narrower as well as longer, and of course contain many more florets, which are for the most part prettily variegated with pale green and purple: but the chief character which distinguishes this from the seventeenth species, lies in the branches of the panicle, which, as the plant goes out of bloom, are reflected or stretched out backwards, so as sometimes to touch the culm; this is effected by little tubercles at the base of the branches, on their upper sides only, which increasing in size as the plant advances in its flowering, forces them backwards. Six years' cultivation made no alteration in the appearance of this Grass, which flowers from June to September, and is not of sufficient merit to recommend it for agricultural purposes. Native of the Palatinate, Silesia, Austria, and England. Hudson found it in Devonshire, Kent, Yorkshire, and Lancashire, on a sandy soil. Mr. Curtis says, it is common in pastures, and by roadsides on our sea-coasts, but that, like the forty-first species, it is not confined to maritime situations, for he found it among the grassy herbage on the right hand of the horse road leading up the hill to Hampstead, in tolerable plenty.

59. Poa Divaricata; *Spreading Meadow Grass.* Branches of the panicle corymbed; peduncles club-shaped; spikelets four-flowered; leaflets filiform. Culms several, a hand in height, with one or two leaves on them, white or reddish; leaves two or three inches long, with wide sheaths. This is a small, delicate, slender, annual grass, flowering in the spring: the thickened flower-stalks, and the crowded little spikelets, are characteristic of this species.—Native of the south of France and Barbary.

60. Poa Cristata; *Crested Meadow Grass.* Panicle spiked; calices somewhat hairy, four-flowered or thereabouts, longer than the peduncle; petals awned. Root cespitose, composed of simple tomentose fibres; culms solitary, simple, erect, a span high, even, leafy, especially at the base. From the habit, this Grass should be considered as an *Aira*, rather than a *Poa*; nor does the number of florets much stand in the way, these generally being only two; the point of the glume is sometimes extended into a short awn.—Native of Germany, Switzerland, France, England, and Barbary, in dry pastures, by way and wood sides, in barren land, and sometimes on walls; flowering from June to August.

61. Poa Peruviana; *Peruvian Meadow Grass.* Panicle spiked; spikelets five-flowered, ovate; leaves and culms procumbent, hirsute.—Native of Peru. This species is an annual, and flowers all the summer in the open air, but must be put into the stove in winter.

62. Poa Glomerata; *Glomerate-panicled Meadow Grass.* Panicle spiked, glomerate; spikelets four-flowered; corollas ciliate.—Native of the Cape.

63. Poa Ciliaris; *Ciliated Meadow Grass.* Panicle contracted; inner valves of the glumes hairy, ciliate; culm from two inches to half a foot in height, simple, slender, erect, smooth. This is a middle species between *Briza* and *Poa.* Browne says, that it seldom rises above six or seven inches, and is sustained by a very slender weakly stalk; it is easily distinguished by its delicate branches, fine leaves, and downy head. Linneus remarks, that the panicle is red, and the cilias of the glumes white. Annual, flowering in July and August.—Native of Jamaica and other West India Islands, on sandy grounds.

64. Poa Plumosa. Panicle diffused; calices six-flowered; inner valves of the corollas linear, recurved, ciliated at the back. Culms several, crowded, from six inches to a foot in height, filiform, leafy; flowers numerous, minute. It differs from the preceding species in the form of the panicle; and the flowers, as well as the cilias, are smaller.—Native of the East Indies.

65. Poa Flexuosa; *Zigzag Meadow Grass.* Panicle flexuose; spikelets three-flowered; glumes ovate, connected by a villus at the base; all the stipules lanceolate. Culms several, a span high, ascending, knee-jointed, with about three knots, leafy, somewhat angular at top, striated, glaucescent. This is distinct from the second species, in its glaucous colour, more leafy culm, narrower sharper leaves, rugged above, with longer sheaths; all the stipules of the same shape; the peduncles flexuose; the glumes narrower and connected, and the keel and edge not bristly and silky. It is perennial, flowering in July.—Native of the Highlands of Scotland.

66. Poa Cæsia; *Sea-green Meadow Grass.* Panicle diffused; spikelets ovate, five-flowered; glumes lanceolate, somewhat silky, free; stipules very short, blunt. Root subcespitose, perennial; herb glaucous; culm a foot high, erect, round, striated, smoothish; towards the base leafy, and having two knots; above simple, straight, naked. It flowers in June and July.—Found on the mountains of Breadalbane in Scotland.

67. Poa Cinerea; *Ash-coloured Meadow Grass.* Stem-leaves erect, involuted; spikelets three-flowered, ciliate at the base, acute. Perennial, and probably a mere variety of the seventh species.—Native of Dauphiny.

68. Poa Brizoides; *Briza-like Meadow Grass.* Panicle contracted; spikelets round, four-flowered, awnless, about a foot high; corollas purple at the base. The spikelets resemble *Festuca Fluitans* in shape: annual.—Native of Dauphiny.

69. Poa Fluitans; *Floating Meadow Grass.* Panicle branched, divaricated; spikelets close pressed, cylindrical, many-flowered; florets obtuse, with seven ribs, and intermediate ones at the base.—Grows in ditches and slow rivulets; perennial, flowering throughout the summer, in most parts of Europe: found also in New South Wales.

70. Poa Montana; *Mountain Meadow Grass.* Panicle strict; spikelets two-flowered; glumes villose at the base; culm straight, hard, with black knots.—Native of Switzerland and Piedmont.

71. Poa Sabauda; *Savoy Meadow Grass.* Panicle loose; spikelets two-flowered; flowers twice as long as the calix, very smooth; culm three feet high, erect. This Grass has the appearance of an *Avena*, but there are no awns.—Found between Salencho and Chamouny, in Savoy.

72. Poa Viridis. Panicles diffuse; spikelets ovate, subquadriflorous; glumes lanceolate, trinerve; ligule slightly truncated.—A common American grass, flowering in June.

73. Poa Crocata. Panicles lax, patulous; spikelets ovate, quadriquinqueflorous, pedicellated; flowers oblong, subpubescent; leaves glabrous; sheaths with a naked neck; culm erect, glabrous.—Grows in Canada, Hudson's Bay, &c.

74. Poa Hirsuta. Panicles very branchy, capillary; spikelets scattered, pedicellated, subquinqueflorous; flowers oblong, acute, glabrous; leaves with a culm, glabrous; sheaths very rough; culm erect, thick.—Grows in sandy fields from New Jersey to Carolina.

75. Poa Quinquefida. Panicles erect; inferior branches naked on the under side; spikelets oblong, alternate, subsessile, six-flowered; leaves glabrous, with an erect culm; valves of the floscules quinquefid at the top. A very common Grass in mountain meadows, from New England to Carolina.—Pursh says, that this Grass is mown twice a year, producing most excellent crops each time, without manure, or any other trouble than the mowing, lasting for the space of sixteen years, without the least decline in the crops, the soil at the same time being a very indifferent one.

76. Poa Pectinacea. Panicles lax, patulous, erect; spikelets linear, twelve-flowered; leaves glabrous, with an erect culm; flowers ovate, acuminate, trinerved; neck of the sheaths, and axils of the panicle, hairy.—Grows in sandy fields from New Jersey to Carolina.

77. Poa Spectabilis. Panicle divaricate, very branchy; spikelets pendulous, linear, ten-flowered; flowers ovate, scabrous; neck of the sheaths, and axils of the panicle, hairy; leaves with an erect short culm, glabrous. This is a very sightly Grass; the large panicle is of a purple colour, mixed with green stripes.—It is found in dry barren sand fields, from New York to Carolina.

78. Poa Reptans. Panicles fasciculate; spikelets subsessile, very long, many-flowered; flowers oblong, acute, lax; leaves short, pubescent; culm branchy, creeping. This is the most delicate Grass in North America.—It is found in mossy swamps and shady places in Pennsylvania, Virginia, and on the banks of the Mississippi, flowering in July.

Podalyria. See *Sophora.*

Podophyllum; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth three-leaved, large, coloured, concave, erect; leaflets ovate, concave, deciduous. *Corolla:* petals nine, orbicular, concave, plaited at the edge. *Stamina:* filamenta very many, very short; antheræ oblong, large, erect. *Pistil:* germen roundish; style none; stigma blunt, plaited. *Pericarp:* berry ovate, crowned with the permanent stigma, one-celled. *Seeds:* very many, roundish; receptacle central, free. Essential Character. *Calix:* three-leaved. *Corolla:* nine-petalled. *Berry:* one-celled, crowned with the stigma.—The species are,

1. Podophyllum Peltatum; *Duck's-foot,* or *May-apple.* The root is composed of many thick tubers, fastened together by fleshy fibres, which spread, and propagate greatly under ground, sending out many smaller fibres, which strike downward; stems solitary, simple, two feet high, crowned with two large, stalked, peltate, lobed, and jagged smooth leaves, between whose footstalks grows a solitary drooping white flower, appearing in May, and when it falls off, the germen swells to a fruit of the size and shape of the common Hip, or fruit of the wild Rose. Native of many parts of North America.—It propagates so fast by its creeping roots, that few persons are at the trouble of sowing the seeds. Every part of the roots will grow; so they may be annually parted, either in autumn when their leaves decay, or in the spring just before the roots begin to shoot; they require no other culture but to keep them clean from weeds. It loves a light loamy soil, and a shady situation, and is so hardy as to be seldom injured by the frost.

2. Podophyllum Diphyllum. This is separated from this genus by Barton, Michaux, and Pursh.

Pohlia; a genus of the class Cryptogamia, order Musci.—Generic Character. *Capsule:* ovate-oblong, placed on an obconical narrower apophysis. *Peristome:* double; *outer* with sixteen broadish teeth, *inner* with a sixteen-parted membrane. *Males:* gemmaceous, on a distinct plant.—There is but one species.

Poison Ash. See *Rhus* and *Foxicodendron.*

Poison Nut. See *Strychnos.*

Poke, Virginian. See *Phytolacca.*

Polemonium; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-

leafed, half five-cleft, inferior, goblet-shaped, acute, permanent. *Corolla:* one-petalled, wheel-shaped; tube shorter than the calix, closed by five valves placed at the top; border five-parted, wide, flat; segments roundish, blunt. *Stamina:* filamenta five, inserted into the valves of the tube, filiform, shorter than the corolla, inclining; antheræ roundish, incumbent. *Pistil:* germen ovate, acute, superior; style filiform, the length of the corolla; stigma trifid, revolute. *Pericarp:* capsule three-cornered, ovate, three-celled, three-valved, opening at the top, covered; partitions contrary to the valves. *Seeds:* very many, irregular, sharpish. ESSENTIAL CHARACTER. *Corolla:* five-parted, the bottom closed by valves bearing the stamina. *Stigma:* trifid. *Capsule:* three-celled, superior.——The species are,

1. Polemonium Cœruleum; *Common Polemonium.* Leaves pinnate; flowers erect; calices longer than the tube of the corolla. Root perennial, fibrous; herb smooth; stems upright, rising to the height of eighteen or twenty inches, seldom more, leafy, panicled. Mr. Miller remarks, that the lower leaves have eleven or twelve pair of leaflets, besides the odd one; that they are broadest at the base, end in points, and are sessile; that the stem-leaves are of the same form, but decrease upwards in size; that the stalks are hollow, channelled, and terminated by bunches of flowers, which sit very close, and are of a beautiful blue colour: hence this is called *Blue-flowered Polemonium;* it is also called *Greek Valerian,* and *Jacob's Ladder,* or *Ladder to Heaven.* Besides the variety with white flowers, which is very common, and frequently rises from the seeds of the blue, there is another, with variegated flowers; and a third, with variegated leaves. Caspar Bauhin observes, that this plant has nothing in common with the Valerians, except something in the shape of the leaves. It has not in fact the least affinity, in appearance, character, sensible qualities, or medical virtues. The flowers appear at the end of May, and the seeds ripen in August.—Native of Asia; and of the north of Europe, in Germany, Switzerland, Sweden, Lapland, and Denmark.—To propagate it, sow the seeds in the spring, upon a bed of light earth; when they come up pretty strong, prick them out into another bed of the same earth, four or five inches asunder, shading and watering them until they have taken root; keep them clear from weeds until Michaelmas, and then transplant them into the borders of the pleasure-garden. They are not of long duration, but by taking up the plants in autumn, and parting them, they may be continued some years; but as seedling plants flower stronger than offsets, few persons propagate them by slips. The varieties may be continued by parting the roots at Michaelmas. They should have a fresh light soil; if too rich, the roots will be apt to rot in winter, and the stripes on the leaves to go off.

2. Polemonium Reptans; *Creeping Polemonium,* also called *Greek Valerian.* Leaves pinnate, with about seven leaflets; flowers terminating, nodding. This has creeping roots, by which it multiplies very fast. The stalks rise nine or ten inches high, sending out branches their whole length. The flowers are produced in loose bunches, on pretty long peduncles; they are smaller than those of the common sort, and of a lighter blue colour.—Native of North America. It may be increased by seeds or offsets like the preceding; but though equally hardy, is less beautiful.

3. Polemonium Roelloides; *Roella-like Polemonium.* Erect: stem filiform; leaves lanceolate, ciliate; panicle few-flowered, peduncled, naked.—Found at the Cape.

4. Polemonium Campanuloides; *Campanula-like Polemonium.* Erect, smooth: leaves linear-lanceolate, entire, erect; flowers terminating, solitary.—Native of the Cape.

Poley, Mountain. See *Teucrium.*

Polianthes; a genus of the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* none. *Corolla:* one-petalled, funnel-form; tube curved inwards, oblong; border patulous, with six ovate segments. *Stamina:* filamenta six, thick, blunt, at the top of the tube; antheræ linear, longer than the filamenta. *Pistil:* germen roundish, at the bottom of the corolla; style filiform, mostly shorter than the corolla; stigma trifid, thickish, melliferous. *Pericarp:* capsule roundish, obtusely three-cornered, at the base involved in the corolla, three-celled, three-valved. *Seeds:* very many, flat, incumbent, in a double row, semi-orbiculate. ESSENTIAL CHARACTER. *Corolla:* funnel-form, curved in, equal. *Filamenta:* inserted into the mouth of the tube, erect. *Germen:* at the bottom of the corolla.——The only species is,

1. Polianthes Tuberosa; *Common Tuberose.* Root perennial, tuberous, somewhat creeping; stem simple, erect, round, leafy, about three feet high; leaves scattered, linear-lanceolate, sheathing, smooth, pale, and rather glaucous; flowers several, in a terminal, oblong, bracteated spike, white, sometimes tinged with a blush of pink, their odour rich and delicious, most powerful at night. This well-known plant has been long cultivated in the English gardens, for the exceeding beauty and fragrancy of its flowers: as the roots are too tender to thrive in the full ground in England, there are few persons who care to take the trouble of nursing up their offsets till they become blowing roots, because it will be two or three years before they arrive at a proper size for producing flowers; and as they must be protected from the frost in winter, the trouble and expense of shelter is greater than the roots are worth, for they are generally sold pretty reasonable by those who import them from Italy. The *Double-flowering Tuberose* is a variety of the first, which was obtained from Mons. le Cour, of Leyden. Other varieties are, the *Striped-leaved Tuberose,* and the Tuberose with a smaller flower. The last is frequent in the south of France, whence the roots have often been brought to England early in the spring, before their roots have arrived from Italy, whence they are annually imported. The difference between it and the common sort, lies in the stalk being weaker and shorter, and the flowers smaller. As there is no way of propagating the double-flowered sort but by offsets, most people are careful to increase it; this is done by planting them upon a moderate hot-bed early in March, and covering the beds in cold weather with mats or straw, giving them abundance of water in the drought of summer. In this bed the roots may remain till the leaves decay in autumn; but if any frost should happen before that time, the beds should be covered, because if the frost enters so low as to reach the roots, it will kill them; and if the leaves are injured by the frost, it will weaken the roots. Where there is due care taken to screen them from the frost and too much wet, it will be the best way to let the roots remain in the bed till the end of November, or the beginning of December, provided hard frosts do not set in sooner; for the less time the roots are out of the ground, the stronger they will be, and the sooner they will flower. When taken up, they should be cleared from the earth, and laid in dry sand, secure from frost and wet until the season for planting them returns. The other sorts should be treated in the same way.—It is next necessary to give directions concerning the roots annually imported from Italy. In choosing the roots, select the largest and plumpest, which, when perfectly sound, are the best: the fewer offsets they have, the stronger they will flower; but the under part of the root should be particularly examined, because it is there that they first decay. Before the

roots are planted, let the offsets be taken off, as, if left on, they will draw away part of the nourishment from the old root, whereby the flower-stems will be greatly weakened. As these roots commonly arrive in England in the month of February or March, those who are desirous to have these early in flower, should make a moderate hot-bed soon after the roots arrive, which should have good rich earth laid upon the dung, about seven or eight inches deep; this bed should be covered with a frame, and when the bed is in a proper temperature, the roots should be planted six inches every way apart. The upper part of the root ought not to be buried more than one inch in the ground: when the roots are planted, there should be but little water given them until they shoot above ground; for too much wet will rot them while they are in an inactive state; but afterwards they will require plenty of water, especially in warm seasons. When the flower-stems begin to appear, a large share of air must be admitted, or the stalks will draw up weak, and produce few flowers; for the more air these plants enjoy in good weather, the stronger they will grow, and the more flowers will they produce. At the beginning of May, therefore, the frame may be quite taken off the bed, and hoops fastened over it to support a covering of mats, which need not be laid over but in the night, or in very cold weather: so that by enjoying the free open air, their stems will be large; and if they are well watered in dry weather, there will be many large flowers on each stem. This first planting requires more care than those which are to follow; for in order to have a succession of these flowers, the roots should be planted at three different times: first, in the beginning of March; next, in the beginning of April; and lastly, at the end of April, or the beginning of May: these beds will require a much smaller quantity of dung than the first, especially that bed which is last made; for if there be but warmth enough to put the roots in motion, it is as much as will be required: and this last bed will need no covering; for very often those roots which are planted in the full ground at this season, will produce strong flowers in autumn; but in order to secure their flowering, it is always the best way to plant them on a gentle hot-bed. As to the second bed, that should be arched over with hoops, and covered with mats every night, and in bad weather, otherwise the late frosts, which frequently happen in May, will pinch them. These plants may remain in the beds until the flowers are near expanding, at which time they may be carefully taken up, preserving the earth to their roots, and planted in pots, and then placed in the shade for about a week to recover their removal; after which time the pots may be removed into halls or other apartments, where they will continue in beauty a long time, and their fragrant odour will perfume the air of the rooms where they are placed; and by having a succession of them, they may be continued from Midsummer to the end of October or middle of November: but as the stems of these plants advance, there should be some sticks put down by each root, to which the stems should be fastened, to prevent their being broken by the wind. It is a common practice with many people to plant these roots in pots, and plunge the pots into a hot-bed; but there is much more trouble in raising them by this method than by that above directed; for if the roots are not planted in very small pots, there will be a necessity of making the beds much larger, in order to contain a quantity of the roots; and if they be first planted in small pots, they should be shaken out of them into pots of a larger size when they begin to shoot out their flower-stems, otherwise the stalks will be weak, and produce but few flowers; hence the other method is the best, if performed with care. When the roots are strong and properly managed, the stems will rise three or four feet high, and each stem will produce ten or twelve flowers; and in this the great beauty of the flowers consists, for when there are but a few flowers upon the stalks, they will soon fade away; so their places must be frequently renewed: for the flowers are produced in spikes coming out alternately upon the stalk, the lower flowers opening first; and as these decay, those above them open, so that in proportion to the number of flowers upon each stalk, they continue in beauty a longer or a shorter time. The sort with double flowers will require a little more care to have the flowers fair; but this care is chiefly at the time of blowing, for the flowers of this sort will not open if they are exposed to the open air: therefore when the flowers are fully formed, and nearly opening, the pots should be placed in an airy glass-case, or a shelter of glasses should be prepared for them, that the dews and rains may not fall upon them, for that will cause the flowers to rot away before they open; and the heat of the sun drawn through the glasses will cause their flowers to expand very fairly. With this management, says Mr. Miller, I have had this sort with very double flowers extremely fair, and upwards of *twenty* upon one stem; but where this has not been practised, I have rarely seen one of them in any beauty.

Pollia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* six-petalled; petals, the three outer ovate, concave, wider at the tip, blunt; the three inner alternate, with the outer bending in, nerved, very slender. *Stamina:* filamenta six, capillary, curved in at the tip, inserted into the receptacle; antheræ round, twin. *Pistil:* germen globular, superior; style filiform, subulate, incurved; stigma simple, blunt. *Pericarp:* berry globular, surrounded by the permanent reflex corolla. *Seeds:* very many, as far as twenty, angular. Essential Character. *Corolla:* inferior, six-petalled. *Berry:* many-seeded.——The only known species is,

1. Pollia Japonica. Stem angular, erect, jointed, little branched, rough, with villose hairs, two feet high; branches alternate, short, flowering successively, resembling the stem; leaves on the lower part of the stem approximating, on the upper very remote, alternate, embracing, ensiform; flowers verticillate, corymbed, snow-white. Jussieu doubts whether this plant be not more nearly allied to the *Asparagi* than the *Junci*, and whether the fruit be not really a berry. It flowers in September.—Native of Japan, near Nagasaki; and of the island of Java.

Pollichia; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, pitcher-shaped, slightly five-cornered, five-toothed, permanent; its orifice contracted by an elevated, pellucid, reticulated ring. *Corolla:* petals five, alternate with the divisions of the calix, fixed in the ring, small, triangular. *Stamina:* filamenta one, incurved, proceeding from the orifice of the calix, through a cleft in the ring, opposite to and about the length of its upper segment, which is a little larger than, and somewhat remote from, the rest; anther roundish, two-lobed, incumbent. *Pistil:* germen superior, in the bottom of the calix, ovate, smooth; style filiform, as long as the calix, forked: stigmas two, obtuse, fringed. *Pericarp:* none, except a thin membrane. *Seed:* solitary, ovate, filling the cavity of the thickened calix. *Receptacle:* a scale under each flower, roundish, succulent, often compound; after flowering, gradually enlarging, and at length becoming very juicy, pellucid, white, and shining, obtuse, incurved, supporting the fruit on the inside about half way up. Essential Character. *Calix:* one leaf, five-toothed. *Corolla*

five-petalled. *Seed:* solitary. *Receptacle:* producing succulent aggregate scales, sustaining the fruit.——The only known species is,

1. Pollichia Campestris; *Whorl-leaved Pollichia.* Root fibrous, biennial; stems several, inclined, round, invested with a thin white down, branched, leafy; branches mostly alternate, erect, leafy, many-flowered; leaves in whorls six together, of which the two outermost are, generally speaking, the largest, except in the lower part of the stem; flowers in sessile, opposite, axillary clusters, at almost every whorl of the branches, numerous, small, green; fruit a larger head of crowded, juicy, sweet, pearly-white scales, each supporting a brown calix, containing one seed. It flowers in September. —Native of the Cape.

Polyanthus Narcissus. See *Narcissus Tazetta.*

Polycardia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* very small, five-lobed. *Corolla:* petals five, rounded. *Stamina:* filamenta five, very short; antheræ roundish. *Pistil:* germen broad; style one; stigma notched. *Pericarp:* capsule coriaceous, five-celled, five-valved, (sometimes three or four celled, three or four valved;) valves septiferous in the middle; partitions seminiferous on each side at the base. *Seeds:* few, oblong, half-arilled at the hilum; aril calix-form, laciniated. Essential Character. *Petals:* five, rounded. *Stigma:* notched. *Capsule:* five-celled, five-valved. *Seeds:* arilled.——The only known species is,

1. Polycardia Madagascarensis. This is a singular shrub, approaching in habit to *Xylophylla* and *Phyllanthus.* Leaves alternate, petioled; the barren ones lanceolate, acute, or obtuse, veined, quite entire; the fertile or floriferous ones quite entire, obcordate, wedge-form at the base; flowers three or four on the top of the fertile leaf, at the end of the midrib.—Native of Madagascar.

Polycarpon; a genus of the class Triandria, order Trigynia.—Generic Character. *Calix:* perianth five-leaved; leaflets ovate, concave, keeled, mucronate, permanent. *Corolla:* petals five, very short, ovate, emarginate, alternate, permanent. *Stamina:* filamenta three, filiform, shorter by half than the calix; antheræ roundish. *Pistil:* germen ovate; styles three, very short; stigmas blunt. *Pericarp:* capsule ovate, one-celled, three-valved. *Seeds:* very many, ovate. Essential Character. *Calix:* five-leaved. *Petals:* five, ovate, very small. *Capsule:* one-celled, three-valved. *Seeds:* very many.——The only known species is,

1. Polycarpon Tetraphyllum; *Four-leaved All-seed.* Stem very much branched, diffused, divaricating; leaves opposite, or in fours, obovate, quite entire, somewhat fleshy, smooth; stipules and bractes acuminate, scariose, white; panicles terminating, dichotomous; flowers numerous, small, inodorous; calix green, edged with white; petals white. This common weed is annual, and flowers from May to August, and even in winter.—Native of many parts of Europe, in a dry soil; as, in Germany, the south of France, Istria, Italy, and Barbary; in England, on the coasts of Devon and Dorset; about Lymston, near Exeter; close to the shingle beach on the neck of the island, and about Exmouth in Devonshire.

Polycnemum; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved; leaflets ovate, erect, mucronate, permanent. *Corolla:* none. *Stamina:* filamenta two or three, capillary, shorter than the calix; antheræ two-lobed. *Pistil:* germen roundish; style very short, two-parted; stigmas obtuse. *Pericarp:* capsule ovate, with the top flattish and margined, acuminate, with the permanent style, membranaceous, thin, valveless, not opening. *Seed:* single, kidney-form. *Observe.* Most of the species have two bractes under the calix, and which are taken by some for the calix, and the calix for the corolla. Other species have two, three, or four calicine leaflets. The stamina are generally one, two, three, or five in number; the style is also sometimes double. Essential Character. *Calix:* five-leaved. *Corolla:* none. *Style:* divided. *Capsule:* membranous, not bursting. *Seed:* one, almost naked.——The species are,

1. Polycnemum Monandrum; *One-stamined Polycnemum.* Monandrous: leaves linear, acute; stem erect. Perennial. —Native of Siberia, on a dry saltish soil.

2. Polycnemum Sclerospermum. Diandrous: leaves cylindric, fleshy; stem erect, branched. Annual.—Found in the muddy salt soils of Siberia.

3. Polycnemum Arvense; *Trailing Polycnemum.* Triandrous: leaves awl-shaped, three-sided; stem diffused. A small annual herb; branches procumbent, simple, or subdivided, striated, somewhat hairy, knobbed, with a callus at the inside of the base; flowers axillary, sessile, solitary, whitish. Gærtner commends Adanson for having united this genus with *Camphorosma,* the number of parts in the flowers being so various, as the observations of Pallas have abundantly shewn. It flowers in July.—Native of France, Italy, Germany, Switzerland, and Austria, in corn-fields.

4. Polycnemum Salsum; *Triandrous Polycnemum.* Triandrous: leaves filiform, fleshy, sheathing; stem diffused. Perennial.—Found in the wet salt sands of Siberia.

5. Polycnemum Oppositifolium; *Opposite-leaved Polycnemum.* Pentandrous: leaves opposite, fleshy, cylindrical; stem erect. Annual.—This was discovered in the salt marshes near the Caspian Sea.

Polygala; a genus of the class Diadelphia, order Octandria.—Generic Character. *Calix:* perianth five-leaved, small; leaflets ovate, acute; two below the corolla, one above that, and two in the middle, subovate, flat, very large, coloured like wings, permanent. *Corolla:* subpapilionaceous; standard almost cylindrical, tubular, short, with a small reflex mouth, bifid; keel concave, compressed, ventricose towards the tip; appendix of the keel in most of the species two or three parted; pencil-shaped bodies fastened to the keel towards the tip. *Stamina:* filamenta eight, in two sets, connected, enclosed within the keel; antheræ eight, simple. *Pistil:* germen oblong; style simple, erect; stigma terminating, thickish, bifid. *Pericarp:* capsule obcordate, compressed, with an acute margin, two-celled, two-valved; partition contrary to the valves, opening at each margin. *Seeds:* solitary, ovate; Gærtner says, with a glandular umbilicus. *Observe.* The appendix to the keel is different in the different species; and in many the pencil-shaped appendix is wanting; and they are therefore called beardless. Essential Character. *Calix:* five-leaved, with two of the leaves shaped like wings, and coloured. *Capsule:* obcordate, two-celled.——The species are,

* Crested: *the flowers having a pencil-shaped appendix.*

1. Polygala Incarnata; *Flesh-coloured Milkwort.* Flowers in spikes; stem herbaceous, branched, erect; leaves alternate, awl-shaped; root annual; branches commonly three, in the upper axils long, narrow; leaves flat, very sharp, remote, scarcely eight for the most part upon the stem.—Native of Virginia and Canada.

2. Polygala Aspalatha. Flowers in heads; stems quite simple; leaves bristle-shaped, scattered; corolla white, with lanceolate wings, and a pencilled keel. It appears like an *Aspalathus.*—Native of Brazil.

3. Polygala Braziliensis; *Brasilian Milkwort.* Flowers subspiked; stems quite simple; leaves lanceolate, scattered; spike straight, terminating, white, with the flowers on very short pedicels, without bractes.—Native of Brazil.

4. Polygala Trichosperma; *Hairy-seeded Milkwort.* Flowers in spikes; stems rod-like, striated; leaves linear; root perennial; spikes terminating, oblong, toothletted below from the falling of the flowers; corolla minute, white. Nearly allied to the first species.—Native of New Granada.

5. Polygala Amara; *Bitter Milkwort.* Flowers in racemes; stems almost upright; radical leaves obovate, larger. This agrees so nearly in habit with the next species, that they are not readily distinguished. The radical leaves are thicker and obovate, wider and very blunt; the stem-leaves more declining. The whole plant, except the root, is always extremely bitter; a leaf slightly chewed affects the tongue very strongly, soon diffuses itself over the whole jaws, and continues a long time. Probably the virtues attributed to the thirty-third species reside in this equally. Gesner asserts, that an infusion of it purges without any harm: a tincture of four ounces of it, in a pint of Canary wine, is extremely bitter, and of a brownish colour. It is employed in the pleurisy, in malignant and milk fevers, and in pulmonary consumption. A drachm of the root in powder, is given as a dose; or an ounce, in a pint and half of water, boiled down to a pint, and drank with milk. The thirty-second sort is more stimulant and resolvent, but this appears to abound in balsamic resin. It is certainly more efficacious than Common Milkwort; but that is probably owing to its growing in mountainous situations. Allioni considers it as biennial.—Native of France, Switzerland, Silesia, Austria, Carniola, and Piedmont. Sow the seeds of this, and of the three following species, soon after they become ripe. These are rarely admitted into gardens, where they do not thrive well.

6. Polygala Vulgaris; *Common Milkwort.* Flowers in racemes; stems herbaceous, simple, procumbent; leaves linear-lanceolate. The perennial woody root throws out many spreading procumbent stems, clothed with deep green smooth leaves, which vary much in size and figure. The flowers are commonly blue, but are often white, flesh-coloured, or purple, and in all cases marked with green lines: their form is singular and elegant, like little flies, and they compose long terminal clusters. The permanent calix turns at length wholly green, and wraps up the young pod, closing and drooping to protect it from rain; so that the elegant fringed crest of the corolla protects the stamina and pistilla, admitting air, but excluding rain and insects.—The whole herb is very bitter. An infusion of it, taken to the amount of a quarter of a pint every morning, fasting, has been successfully given for a catarrhous cough. Allioni says, it has the same properties as the preceding species, in an inferior degree, and with less of the balsamic principle, though it is not to be despised as a succedaneum to the thirty-third species, in pleurisy and peripneumony, and that it also promotes expectoration. It possesses the virtues of the Rattlesnake Root, but in an inferior degree. It has been used in pleuretic cases with many happy effects: see the thirty-second species. The powdered root may be taken in doses of half a drachm or more, or a strong decoction may be drank to the amount of a pint or more in a day, in which quantities it sometimes acts as a brisk purgative, and sometimes it only operates by sweat. Foreign writers celebrate it as a grateful nutriment for cattle: according to Linneus, cattle, sheep, and goats eat it, but swine refuse it.—It is the only British species, and is chiefly found in dry barren pastures, heaths, or sheep-walks, though it is a native of most parts of Europe and of Barbary, in dry heathy pastures, and on rocks, flowering in June and July.

7. Polygala Major; *Large Milkwort.* Flowers in racemes; stem herbaceous, simple; leaves linear, lanceolate. This is very nearly allied to the preceding, but the flowers are always of a bright red purple, and the whole of the plant is larger, and more upright. Probably a variety only.—Native of Austria.

8. Polygala Monspeliaca; *Montpelier Milkwort.* Flowers in racemes; stem upright; leaves lanceolate, linear, acute; root annual.—Native of the south of France, of Piedmont, and of Algiers, on barren hills.

9. Polygala Paniculata; *Panicled Milkwort.* Flowers crested; clusters lateral, on very long stalks; stems herbaceous, erect, branched at top; leaves linear, acute. Root annual; branches filiform, erect, leafy, smooth; flowers minute, purplish, nodding, on very short pedicels.—This beautiful little plant is a native of Jamaica and Hispaniola. It has much the smell and taste of the thirty-second species, but is not so strong and disagreeable. It is a mild attenuant and sudorific, and may be administered in infusions or decoctions.

10. Polygala Sibirica; *Siberian Milkwort.* Racemes lateral, naked; stems herbaceous; leaves lanceolate. This has the habit of the preceding species.—Native of Siberia.

11. Polygala Bracteolata; *Spear-leaved Milkwort.* Flowers in racemes; bractes three-leaved; leaves linear-lanceolate, smooth; stem erect, shrubby. This is a plant of great singularity and beauty: the purple of its flowers is brilliant in the extreme. There are four varieties worthy of notice: The first has the keel longer than the crest, the stem branched, and linear-lanceolate leaves. The second has the leaves linear-subulate, and the keel shorter than the crest, with a larger purple flower. The third has subulate leaves, the stem quite simple, and a smaller purple flower. The fourth has the leaves linear, blunt, and rugged, the stem branched, the flowers very small, whitish, or pale purple. The stem is shrubby in all, and the bractes are remarkable; whence the trivial name. They flower from May to July, and are natives of the Cape of Good Hope.—This, and all the other Cape sorts, may be increased by cuttings, some more readily than others.

12. Polygala Umbellata; *Umbelled Milkwort.* Flowers subumbelled; leaves linear, subciliate; stem scarcely suffruticose, a span high, somewhat branched, erect: annual or biennial.—Native of the Cape.

13. Polygala Myrtifolia; *Myrtle-leaved Milkwort.* Keel of the corolla crescent-shaped; stem shrubby; leaves even, oblong, blunt. The flowers are very elegant, and are produced at the ends of the branches; they are large, white on the outside, but of a bright purple within; wings expanded wide, and standard incurved. Each cell of the seed-vessel contains one hard, smooth, shining seed. It continues flowering most part of the summer.—Native of the Cape. This plant is propagated by seeds, which should be sown in small pots, filled with light loamy earth; soon after they are ripe these pots may be placed where they may have the morning sun only, till October, when they should be placed under a hot-bed frame, and plunged into old tanner's bark, which has lost its heat, where they may be defended from frost during the winter; and in the spring the pots should be plunged into a moderate hot-bed, which will bring up the plants. When these appear, they should not be too tenderly treated, but must have a large share of free air admitted to them; when they are fit to transplant, they should be carefully shaken out of the pots, and separated, planting each into a

small pot filled with soft loamy earth, and plunged into a very moderate hot-bed, to forward their taking new root, observing to shade them from the sun, and gently refresh them with water as they may require it, but they must not have much wet. When they are rooted, they must be gradually inured to the open air; and in June they may be placed abroad, in a sheltered situation, where they may remain till the middle or latter end of October, according as the season proves favourable; then they must be removed into the green-house, and treated in the same way as Orange-trees, being careful not to give them too much wet during the winter season. In the summer they must be placed abroad with other green-house plants, where, by their long continuance in flower, they will make a fine appearance.

14. Polygala Venulosa. Flowers crested, racemose; wings of the calix three-ribbed, copiously veined, shorter than the keel; stem ascending; leaves elliptic-lanceolate.—Found in Cyprus, &c. flowering in May.

15. Polygala Glumacea. Flowers crested, racemose; wings of the calix three-ribbed, slightly veined, twice the length of the keel; leaves taper-pointed.—Found in Cyprus, flowering in May.

16. Polygala Oppositifolia; *Opposite-leaved Milkwort.* Stem shrubby; leaves opposite, ovate, acute; flowers crested; clusters short, terminal. This is a shrub two feet high, branched at top; branches alternate, erect, without scars. It flowers in August.—Native of the Cape.

17. Polygala Spinosa; *Prickly Milkwort.* Flowers lateral; stem shrubby; branches spiny; leaves scattered, oval, oblong; fruit drupaceous. This is a stout shrub, with the branches terminated by a strong spine.—Native of the Cape.

18. Polygala Teretifolia. Flowers lateral; stem shrubby, branched; leaves filiform, sickle-shaped.—Native of the Cape.

** Beardless: *the flowers without any pencil;—keeled, frutescent.*

19. Polygala Theezans. Peduncles one-flowered; stem shrubby; leaves alternate, lanceolate. This, like the Birch-tree, has the stem white at the bottom.—Native of Japan and Java.

20. Polygala Trinervia. Peduncles one-flowered; stem shrubby, angular; leaves alternate, cordate, cusped, three-nerved; flowers small; capsules oblong, two-horned at the tip.—Native of the Cape.

21. Polygala Penæa. Flowers lateral, solitary; stem arboreous; leaves obtuse, petioled.—This shrub is a native of South America.

22. Polygala Diversifolia. Flowers in racemes; stem arboreous; older leaves oblong, ovate; younger subovate. This is a small tree, with loose rod-like branches, subdivided, even, round. Browne calls it Bastard Lignum Vitæ of the Red Hills, where this shrub grows very plentifully, generally rising to the height of seven or eight feet or more. It receives the above name, because it tastes not unlike the gum of the Lignum Vitæ, and is sometimes used for the same purposes. Swartz does not see why Linnæus named it Diversifolia, the leaves being all alike; the reason, however, whether well founded or not, is apparent from the specific character.—Native of the woods of Jamaica; where, however, it is not common.

23. Polygala Microphylla; *Small-leaved Milkwort.* Flowers in racemes; stems shrubby; leaves very minute, elliptic.—Native of Spain and Portugal.

24. Polygala Æstuans. Flowers in racemes; stem shrubby; leaves lanceolate, petioled.—Native of New Granada, in South America.

25. Polygala Violacea. Flowers in racemes, lateral and terminating; stem shrubby, hairy; leaves oblong; peduncles toothletted from the fall of the flowers, which are larger than those of the common sort.—Found in Cayenne.

26. Polygala Chinensis. Flowers in spikes, axillary; stem suffruticose; leaves oval.—Native of the East Indies.

27. Polygala Chamæbuxus; *Box-leaved Milkwort.* Flowers scattered; keel rounded at the tip; stem shrubby; leaves lanceolate. It is an elegant little evergreen shrub, of low growth, with leaves like those of the Box, producing flowers from May to October, but most plentifully in June. Each flower stands on a peduncle, proceeding from a kind of triphyllous cup formed of floral-leaves; the true calix is composed of three leaves, which are nearly white; the two outermost petals, similar to the wings of a papilionaceous flower, are also white, or nearly so; the third petal, which forms a kind of tube, and contains the stamina and pistillum, is white at the base, but yellow towards the extremity, where it changes by degrees to a bright bay colour. Clusius and Jacquin mention a variety of this plant, with the calix and wings of a beautiful purple. Scopoli has noticed four varieties: 1. With white wings, and a yellow keel. 2. With white wings, and the keel red at the tip. 3. With red wings, and the tip of the keel yellow. 4. With red wings and keel, but the tip of the latter variegated with red and yellow. Native of Austria, Switzerland, Alsace, Germany, Dauphiny, and Italy.—This is a very difficult plant to cultivate in gardens, for it commonly grows out of the fissures of rocks, hence cannot be easily transplanted, and it is with difficulty that the seeds are obtained from abroad. The seeds will not vegetate till they have been a whole year in the ground, unless they are sown soon after they are ripe, when the plants will come up the spring following. When they first appear, they make very little progress in our climate, and are hard to transplant with safety, so that they are not much known in this country. The best method of cultivating it is by seeds. They should be procured as fresh as possible from the places of natural growth, and sown in pots as soon as they arrive; the pots should be plunged into the ground, where they may have only the morning sun. If sown before Christmas, there will be a chance of their coming up in the following spring. The pots should be plunged into the ground, where they may have but little sun in the following summer, and in the autumn they may be removed, and plunged into an old tan-bed under a hot-frame, where they may be protected from severe frost; for although this plant is a native of the Alps, and other cold mountains, yet, as the seeds will not be covered with snow here, as they are in their native soil and situation, they are frequently spoiled by the inconstancy of the weather in England. When the plants come up, they should be placed in the shade during the summer; and in autumn they may be turned out of the pots, and planted in a border, where they may have only the morning sun, for they will not thrive long in pots. If the winter prove very severe, it will be proper to cover the surface of the ground about their roots with mulch, to keep out the frost. If the plants take root in the border, they should remain there undisturbed, and be only kept clean from weeds; for the ground about their roots should not be dug or dunged. They thrive best in a shady border of bog-earth.

28. Polygala Alopecuroides. Flowers sessile; leaves crowded, ovate, keeled, hairy; stem shrubby, procumbent, branched; the branches covered with leaves and flowers.—Native of the Cape.

29. Polygala Mixta. Flowers sessile; stem shrubby; leaves round, mucronate, crowded.—Native of the Cape.

30. Polygala Squarrosa. Stem shrubby; leaves aggregate, lanceolate, patulous.—Native of the Cape.

31. Polygala Heisteria; *Heath-leaved Milkwort.* Flowers lateral; stem arborescent; leaves three-sided, mucronate, spiny. This is a polymorphous plant, being, when young, very different from what it is when it becomes old. In the course of a few years it becomes a shrub of a considerable size, equalling a small Furze-bush, to which it bears a distant resemblance. The purple of the flowers is brilliant in the extreme, and they are plentifully produced almost throughout the year.—Native of the Cape.

32. Polygala Stipulacea. Flowers lateral; stem suffruticose; leaves in threes, linear, acute; stem filiform.—Native of the Cape.

****Beardless, herbaceous with a single Stem.*

33. Polygala Senega; *Officinal Milkwort,* or *Rattlesnake Root.* Flowers in spikes; stem erect, quite simple, herbaceous; leaves broad-lanceolate; root perennial, woody, branched, contorted, about the thickness of the finger, and covered with ash-coloured bark. The flowers are produced in loose terminating spikes; they are small, pale red, or whitish, and shaped like those of the common sort, but their keel has no beard or crest. It flowers here in July, but does not produce ripe seeds. Native of most parts of North America, on the sides of hills and in dry woods, flowering from June to August.—The root of this plant, under the name of Rattlesnake Root, was first introduced to the attention of physicians, nearly seventy years ago, by Dr. John Tennent, whose intercourse with the Indians led him to discover that they possessed a specific remedy for the bite of the rattlesnake, which was, for a reward, revealed to him, and found to be the root of this plant. He was afterwards fully convinced of the efficacy of this medicine from his own experience; and observing that symptoms of pleurisy or peripneumony were generally produced by the action of this poison, he inferred that it might be a remedy in those disorders. It was accordingly tried in pleurisies, not only by Tennent himself, but by several French academicians, and others, who all unite in testimony of its good effects. However, in many of these cases recourse was had to the lancet. The repute which this root obtained in peripneumonic affections, induced some to employ it in other inflammatory disorders, particularly in rheumatism. It has been said to be very successful in dropsies, which we can the more readily credit, from its effect in increasing the different secretions; for it produces a plentiful spitting, increases perspiration and urine, and frequently purges or vomits. It is also reported to be a medicine of great power in rendering the siziness of the blood more fluid; although De Haen asserts a strong fact to contradict that report. The usual dose is from one scruple to two of the powder; or two or three table-spoonsful of the decoction, prepared by boiling an ounce of the root in a pint and half of water till it is reduced to a pint. A little Madeira wine is most effectual for removing the pungent taste, and making it sit easy on the stomach.—The seeds of this remarkable plant rarely grow in this country; hence the best way to propagate it is to procure the roots from America, and to plant them in a bed of light earth in a sheltered situation. In summer keep them clean from weeds, and keep the surface of the ground about their roots covered with old tanner's bark, or any other kind of mulch, in winter, to keep out the frost.

34. Polygala Lutea; *Yellow-flowered Milkwort.* Flowers in oblong heads; stem erect, quite simple, herbaceous; leaves lanceolate, acute; spike terminating, large for the size of the plant, composed of yellow flowers, closely set on.—Native of most parts of North America.

35. Polygala Viridescens; *Green-flowered Milkwort.* Flowers in globular heads; stem erect, quite simple; leaves lanceolate, bluntish; root annual.—Native of Virginia.

36. Polygala Triflora; *Three-flowered Milkwort.* Peduncles subtriflorous; stem erect; leaves linear, alternate.—Native of Ceylon. Annual.

37. Polygala Glaucoides. Peduncles many-flowered, lateral; stems diffused; leaves acute. This has the appearance of our common Milkwort. Perennial.—Native of Ceylon.

*****Beardless, herbaceous, branched.*

38. Polygala Ciliata; *Fringed Milkwort.* Capsules ciliate, toothed; stem erect; root annual; leaves ovate-lanceolate, sessile, smooth, quite entire; flowers sessile, directed one way: they are small, and variegated with pink, white, and green. It varies with heart-shaped leaves and stems, half a foot high, and branched.—Native of Ceylon.

39. Polygala Sanguinea; *Red-spiked Milkwort.* Peduncles squarrose; stem erect; root annual; leaves alternate, narrow, lanceolate; spikes terminating, loose, blood-red, ovate. The lower flowers, when mature, drop off, whilst new ones are coming on, hence, the peduncle is jagged or squarrose.—Native of Virginia.

40. Polygala Verticillata; *Whorl-leaved Milkwort.* Flowers separate; leaves linear, in whorls; root annual; spikes white, very narrow, with the flowers remote; stem slender. This little plant is exceedingly branched, and at each joint puts forth four or five narrow oblong leaflets. On the tops of the stems and branches it produces slender oblong spikes, composed of whitish flowers.—Native of Maryland.

41. Polygala Cruciata; *Cross-leaved Milkwort.* Leaves in fours. The head of flowers is of a green rufescent colour.—Native of Virginia.

42. Polygala Oxycoccoides. Stem shrubby, procumbent; leaves elliptic, obtuse, thickish. The older branches are tubercled and jointed, the younger ones smooth.—Native of Mount Atlas, in fissures of rocks, flowering early in spring.

43. Polygala Saxatilis. Stems shrubby, decumbent; branchlets pubescent; leaves lanceolate, acute; flowers capitate, racemed. They are like those of the preceding, from which it differs in having lanceolate leaves, more slender and acute, and pubescent branchlets.—Native of Mount Atlas, in the fissures of rocks.

44. Polygala Rosea. Stem shrubby at the base, rod-like, simple; leaves lanceolate, acute; flowers in loose racemes; corollas fringed, tubular; upper lip two-lobed, lower fringed at the top, bright rose-coloured, often exceeding the wings.—Native of Mount Atlas.

45. Polygala Mariana. Flowers beardless, in oblong heads; stem erect, branched; leaves linear; root perennial.—Native of Maryland. Cultivated like the thirty-third species.

46. Polygala Americana. Flowers crested; raceme terminating; stem erect, branched; leaves lanceolate, tomentose.—This plant will not live in the open air of our climate, and as it will not thrive in a pot, is very difficult to preserve here. It is propagated by seeds, procured from abroad.

Polygonum; a genus of the class Octandria, order Trigynia.—Generic Character. *Calix:* perianth turbinate, coloured internally, five-parted; segments ovate, blunt, permanent. *Corolla:* none, unless the calix be taken for it. *Stamina:* filamenta commonly eight, awl-shaped, very short; antheræ roundish, incumbent. *Pistil:* germen three-sided; styles commonly three, filiform, very short; stigmas simple. *Pericarp:* none; the calix involving the seed. *Seed:* single, three-sided, acute. *Observe.* The first species has a two-leaved calix, and three petals. Stamina in some, six; Pistillum in some species, bifid. Essential Character. *Calix:* none, or five-parted, coloured. *Corolla:* five-parted,

calicine, or none, if that be considered as the calix. *Seed:* one, angular.——The species are,

*Atraphaxoides, *with a frutescent Stem.*

1. Polygonum Frutescens; *Shrubby Polygonum.* Stem shrubby; calicine leaflets two, reflex; calix five-leaved; leaflets when ripe equal or unequal, coloured or uncoloured, but constantly loose from the stem. It flowers in July.—Native of Siberia.

2. Polygonum Atraphaxoides. Flowers hexandrous, digynous; leaves ovate, waved.

**Bistortæ, *with a single Spike.*

3. Polygonum Bistorta; *Great Bistort,* or *Snakeweed.* Stem quite simple, with a single spike; leaves ovate, waved, decurrent. Root perennial, and not easily extirpated, somewhat more or less bent or crooked, whence its names *Bistort, Snakeweed,* and *Adder's-wort;* outwardly of a chestnut, inwardly of a flesh-colour, furnished with numerous fibres and creepers. The root being one of the strongest vegetable astringents, might be well applied to the purpose of tanning leather, if it could be procured in sufficient quantity: the young shoots are eaten in herb pudding, in the north of England, where the plant is known by the name of *Easter Giant:* and about Manchester they are substituted for greens, under the name of *Patience Dock.* The root was formerly considered to be alexipharmic and sudorific: but its uses seem only to be derived from its styptic powers. Dr. Cullen frequently employed it in intermittent fevers; and gave it, both alone and with Gentian, to the quantity of three drachms a day. Meyrick observes, that all the parts of the plant have a rough austere taste, but more especially the root, which is of a very binding nature, and may be used to advantage, both externally and inwardly, whenever astringency is required, as for incontinence of urine, immoderate menses, bleeding wounds, spitting of blood, the bloody flux, and other fluxes of the belly. It is also of singular efficacy in a soft spungy state of the gums, attended with looseness of the teeth and soreness of the mouth. Dried and reduced to powder, or boiled in wine, and taken pretty freely, it prevents miscarriage, helps ruptures, dissolves coagulated blood from falls, blows, &c. and kills worms in children.—Native of many parts of Europe, Siberia, and Japan. It is most common in the northern parts of Great Britain, particularly in moist meadows, where it is often a noxious weed, frequently forming large patches, and not easily extirpated: it flowers in May and June. Near London it occurs by Battersea; and in a meadow by Bishop's wood, near Hampstead; in the meadows about Uxbridge; near Rickmansworth in Hertfordshire; Hyde Mill, Luton, and Thurleigh, in Bedfordshire; on the banks of the Isis beyond Ifley; and near Gosford bridge in Oxfordshire; Ham-green near Mathon, and Martley, in Worcestershire; near the infirmary, Stafford; in the closes near Howes House, Whitwell, and Shelford, Cambridgeshire; Brome and Heigham in Norfolk; Tamworth and Fazeley, in Warwickshire; near Derby; Cofgrave in Northamptonshire; Lenton in Nottinghamshire; about Sheffield, Halifax, Bradford, and Settle, in Yorkshire, in all of which places it is very common; near Kendal in Westmoreland; near Newcastle-upon-Tyne; and near Inverary in Scotland.—This plant may be propagated by planting the roots in a moist shady border, either in spring or autumn.

4. Polygonum Viviparum; *Small* or *Alpine Bistort,* or *Viviparous Snakeweed.* Stem quite simple, with a single spike; leaves lanceolate, rolled back at the edge. This has the same habit as the preceding, but is much less. The roots have the same quality, and are eaten by northern nations, and in some parts of Siberia and Tartary. Plants of this species, cultivated during four years in a garden, constantly produced perfect seeds in July, and flowered as constantly a second time in September. These latter germina vegetated on the stem. *Welsh Bistort,* is a small variety of this species; and was found on a very high rock near Lhanberys.—Native of many parts of Europe, in mountainous pastures. In England it is found near Crosby, Ravensworth; in the fields between Shap and Hardingdal; near Wherf, and near the footway leading from that place to Settle; on the edge of Lemer Water at Carr End; and in Wensley Dale, all in Westmoreland. It is not infrequent on the dry stony pastures in Scotland; especially those on the mountain-sides, as about the pass of Killicrankie, near Blair; about Loch Rannoch in Perthshire, Loch Urn in Inverness-shire, on the top of Ben Lomond; and in Benhuardal, in Strath in the Isle of Skye.

***Persicariæ, *with a bifid Pistil, and generally fewer Stamina than eight.*

5. Polygonum Virginianum; *Virginian Persicaria.* Flowers pentandrous, semidigynous; corollas quinquefid, unequal; leaves ovate; stems hard, round, green, with great joints on them. At the tops of the stalks, and from the joints of the leaves, spring spikes of white flowers, succeeded by flat, black, shining seeds; root perennial, consisting of a great bush of long black fibres. It flowers in August and September.—Native of North America.

6. Polygonum Lapathifolium; *Pale-flowered Persicaria,* or *Pale-leaved Dead Arsesmart.* Flowers hexandrous, digynous; peduncles rugged; stipules awnless; seeds concave on each side. Root annual; stem about three feet high, round, smooth, hollow, branched, the branches spreading, swelling very much above the joints, patulous, and sometimes decumbent. It is distinguished from the eleventh species by its being much larger, its joints more swelled, its stipules being much more strongly ribbed at bottom, and without ciliæ; and also by its broader leaves, the veins of which are rather deeper, and more strongly marked. The following are striking varieties: 1. That with a red stalk and red flowers, which is often found on dunghills and in corn-fields, and is like the true species in every respect but its colour; but the red of the flowers is not so bright. 2. This not only varies in having its stalks spotted with red, but the spikes are much more slender, rather more so than those of the eleventh species, and also of a red colour, but not so bright. They are often found together in the ditches about St. George's Fields. When this variety grows in a rich soil, it becomes full as large as the true species; but in a different soil and situation, as on the watery parts of Blackheath and Peckham Rye, it becomes much smaller, generally has its leaves whiter underneath, and may be taken for the eleventh species, if not attentively examined: its spotted stalk, and the roughness of the petioles, will distinguish it readily. 3. The variety with leaves hoary on the under side, is found here and there in corn-fields and other places, where the soil is not very rich, and is obviously enough distinguished. Besides these three remarkable varieties, it varies in size according to the richness or poverty of the ground, and, like the eleventh species, the leaves are sometimes spotted and sometimes not. Small birds are fond of the seeds of this species and its varieties, and the farmer should carefully weed them from his dunghills.

7. Polygonum Amphibium; *Amphibious Persicaria.* Flowers pentandrous, semidigynous; spike ovate. Root perennial, creeping; stems rooting, erect, or floating, a foot and half or more long. This is the only European species in

POLYGONUM ORIENTALE _
Oriental Persicaria.

POLEMONIUM REPTANS _
Greek Valerian.

POLYGONUM BISTORTA _
Great Bistort, or Snakeweed.

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D. W. Cambell sculp.

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the *Persicaria* division of this genus which has a perennial root. It may also be distinguished from others by the leaves being hollowed at the base, and fringed with hairs at the edges; they are also harsher, especially when the plant grows out of the water. This species has the name of *Amphibium*, from its growing both on land and in water. We may conclude that the latter is its natural situation, from its seldom producing the fructification in dry places. From its floating leaves the elder botanists thought it was a *pondweed*, but Ray rectified the mistake. Villars informs us, that it was supposed in Alsace to be injurious to cattle; but he is of opinion that it is rather useful to them, on account of its acid antiseptic qualities. He remarks very justly, that all marshy situations being unwholesome, the plants which are most common there, are accused of doing all the mischief. As a weed, certainly few plants are more pernicious, for the roots not only creep, but penetrate so deeply into the earth, that they are seldom or never eradicated: but as it rarely flowers on arable land, it is a more local plant than some of the same genus, of the seeds of which waterfowl are very fond. —Native of most parts of Europe, in ponds, ditches, and rivers, and sometimes on arable land. In water its long creeping roots run deep into the mud, throwing out whorls of fibres here and there, whilst the leaves float upon the surface, and the beautiful spikes of flowers in July and August are elevated above it. Frequently however, as Ray observes, the roots are thrown out with the mud in clearing ditches, and if by that or any other accident the plants get out of the water, the stems grow more erect, the leaves become narrower and hairy, and the flowers are more sparingly produced.

8. Polygonum Filiforme. Flowers pentandrous, digynous; spikes filiform; leaves ovate; stipules ciliate; stem round, marked with obsolete raised lines, erect, villose, with close-pressed hairs, ferruginous. It flowers in September and October. It is very nearly allied to the thirteenth species. —Native of Japan, near Nagasaki.

9. Polygonum Ocreatum; *Spear-leaved Polygonum.* Flowers pentandrous, trigynous; leaves lanceolate. Flowers in July. Perennial.—Native of Siberia.

10. Polygonum Hydropiper; *Water* or *Biting Persicaria.* Flowers hexandrous, semidigynous; leaves lanceolate, waved, unspotted; spikes filiform, nodding; stem erect; root annual, fibrous. This plant is readily known by its pale unspotted leaves, and lax, slender, drooping spikes, of red and white in conspicuous flowers. Dr. Stokes remarks, that the whole plant is sprinkled with minute glandular dots, but even with the surface, and more obvious with a moderate than a higher magnifier; probably the seat of its very acrid property. Mr. Curtis adds, that these little cells or glands are more particularly observable on the calix, which is accordingly more biting than any other part of the plant. From its hot acrid taste it has the names of *Hydropiper*, *Water Pepper*, and *Arsesmart*. Withering observes, that the whole plant has an exceeding hot biting taste. It cures those little ulcers in the mouth commonly called the thrush; and the distilled water, drank to the quantity of a pint or more in a day, has been found serviceable in the gravel and stone. It is a diuretic of considerable efficacy, and has frequently been administered with success in the jaundice, and the beginning of dropsies. The expressed juice of the fresh-gathered plant appears to be the best preparation of it, and may be taken with safety to the amount of two or three ounces for a dose. This is the only Persicaria that has any pretensions to be an active medicine. When given in infusion or decoction, it proves diuretic, and hence is used in the dropsy and jaundice. The distilled water is recommended by Boyle in the stone and gravel. The ashes of this plant, mixed with soft soap, is a nostrum for dissolving the stone in the bladder; but it may be reasonably questioned whether it has any advantage over other semicaustic preparations of the vegetable alkali. Its acrimony rises in distillation; and the distilled water, drank to the amount of two or three half-pints daily, has been found very effectual in some gravelly cases. Linneus observes, that this plant will dye woollen cloth of a yellow colour; and that all domestic quadrupeds reject it. —Native of most parts of Europe, and found in great abundance on places that lie under water during the winter, flowering in September, a month later than the thirteenth species; from which it differs in its leaves of a yellower hue, its slenderer spikes, and larger, more acuminate, and chestnut-coloured seeds.

11. Polygonum Persicaria; *Spotted Persicaria*, or *Dead Arsesmart.* Flowers hexandrous, semidigynous; spikes ovate-oblong, erect; pedunéles even; stipules ciliate. Root simple, fibrous; stem upright, sometimes rooting at bottom, two feet, or from two to three feet high, alternately branched, round, smooth, gradually thickened above the joints, often red. Each leaf is usually marked with a central, black, or kidney-shaped spot, the under side spotted with glands, and sometimes white and downy. This is very nearly allied to the sixth species, but the style is divided only half way down, mostly into two parts, and then the germen is a little convex on each side; but sometimes into three parts, and then the germen is always triangular. It may be distinguished from the preceding species, which are upright, of an ovate shape more or less round. Its taste is slightly astringent. Woollen cloth dipped in a solution of alum, obtains a yellow colour from this plant. Goats, sheep, and horses, eat it; cows and swine refuse it.—Common in ditches and marshes in most parts of Europe; flowering from July to September.

12. Polygonum Minus; *Small Creeping Persicaria.* Flowers hexandrous, submonogynous; leaves linear-lanceolate, flat; spikes filiform, almost erect; stem rooting at the base. This, which Mr. Curtis has ascertained to be a distinct species, and not a variety of the preceding, as Linneus supposed, is very abundant in the watery parts of Tothill-fields, Westminster; flowering in September.—It has also been found on Putney common; in a gravel pit on Malvern-chase in Worcestershire, and on Costesy common, near Norwich.

13. Polygonum Barbatum; *Bearded Polygonum.* Flowers hexandrous, trigynous; spikes rod-like; stipules truncate, setaceous, ciliate; leaves ciliate, lanceolate; stem herbaceous, rufous.—Thunberg describes three varieties, all which he found in the ditches and swampy parts of Japan. The species he observed at the Cape of Good Hope, Ceylon, and Java.

14. Polygonum Tinctorium; *Dyer's Polygonum.* Flowers hexandrous, trigynous; spikes rod-like; stipules smooth, contracted, truncate, ciliate; leaves ovate, sharpish, smooth; stem herbaceous, perennial, round, two feet high, manifold, nearly erect.—Native of China, near Canton. The Chinese use it to dye a beautiful blue or green colour; and the Japanese cultivate the thirteenth, eighteenth, and twenty-fourth species, for the same purpose.

15. Polygonum Orientale; *Oriental* or *Garden Persicaria.* Flowers heptandrous, digynous; leaves ovate; stem erect; stipules rough-haired, salver-shaped; root composed of many strong fibres, growing in tufts. Stem round, five or six feet high; leaves large, downy, and flaccid, flower-stalks panicled, hairy, laden with thick, obtuse, cylindrical, drooping spikes of beautiful crimson flowers. The stipules are deserving of notice, being unusual in their form, and making the stem look

as if ruffled. The seeds were first sent to Europe by Tournefort, who saw it growing in the prince of Teflis's garden in Georgia, and afterwards in the garden of the monks of the Three Churches near Mount Ararat, where the plant is cultivated not only for the beauty of the flowers, but for its medicinal virtues, which are the same with those attributed to our common species. There is a dwarf variety of it, and another with white flowers; it has also been observed by Linneus to vary in point of hairiness, the Levant variety being less hairy than that from the East Indies. It flowers from July to October, or till the frost in autumn comes on, soon after which the plant decays and dies.—It will rise from scattered seeds much better than from those which are regularly sown; but where the seeds must be sown, it should be soon after they are ripe in autumn. If sown in spring, they rarely succeed; and even if some plants do come up, those never grow so strong. In the spring, transplant those planted in autumn into the borders of the plantation or flower-garden, giving them room. At the beginning of July prune off the side-shoots, to make them advance in height, and preserve them within compass, and when they are pruned up to five or six feet, they may then be permitted to shoot out side-branches. It delights in a rich moist soil, and is distinguished no less for its superior stature than for the brilliancy of its flowers: it will frequently grow to the height of eight or ten feet, and become a rival to the Sun-flower. It is commonly, but injudiciously, sown in the spring with other annuals, thinning the seedlings when they appear, so as to stand a foot apart. It requires very little care, and will bear the air of London better than most other plants.

16. Polygonum Pennsylvanicum; *Pennsylvanian Persicaria.* Flowers octandrous, digynous; peduncles hispid; leaves lanceolate; stipules awnless. This has the appearance and habit of the eleventh species, but all the parts are larger and stiffer.—Native of Pennsylvania.

**** Polygona, *with undivided Leaves, and octandrous Flowers.*

17. Polygonum Maritimum; *Sea Polygonum,* or *Knot-grass.* Flowers octandrous, trigynous, axillary; leaves oval-lanceolate, evergreen; stem suffrutescent. This is not the English Knot-grass, which is a variety of the next species.—Native of the sandy coasts of the Mediterranean Sea; also of the Levant. About the solstice, bladders full of red juice grow upon it, which produce an elegant red dye.

18. Polygonum Aviculare; *Common Knot-grass.* Flowers axillary; leaves elliptic-lanceolate, rugged at the edge; nerves of the stipules remote; stem procumbent, herbaceous. Root annual, branched, somewhat woody, taking strong hold of the earth, of an astringent taste. The clusters of axillary flowers are peduncled, two or three together: they are small, but not inelegant, variegated with white, green, and blood-red. Meyrick says, that this Grass possesses a considerable degree of astringency, which renders it an excellent medicine in loosenesses, attended with a discharge of blood, the bleeding piles, immoderate menstrual evacuations, and all other hæmorrhages. The juice is good to cleanse old filthy ulcers, and takes away pain and inflammation from the eyes. In the present practice however this is justly superseded by more efficacious medicines. This plant obtains its generic name from the abundance of knots on the stem; the trivial name *aviculare,* from the gratefulness of its seed to small birds. The English appellation *Knot-grass,* has arisen, first, from the knottiness of the stem; and second, because, having been eaten by cattle, like many other plants, it has been called a Grass, though bearing no resemblance to real Grasses. Hogs eat it with great avidity, and hence it is known in many countries by the name of *Hogweed;* in fact all granivorous domestic quadrupeds eat it, and the seeds are useful for every purpose in which those of Buckwheat are employed.—This is one of our commonest plants, especially in a sandy or gravelly soil, on banks by paths, and in corn-fields; it frequently covers much ground, where the natural grass has been destroyed. Where it grows singly in a rich or newly thrown up soil, a single plant will often cover the space of a yard or more; and the leaves are then broad and large, but when it grows very thick together, it is in every respect smaller. On our sandy coasts it is found with large oval thick leaves, but not perennial.

19. Polygonum Erectum; *Upright Polygonum.* Flowers axillary; leaves oval; stem erect, herbaceous.—Native of Philadelphia, in North America.

20. Polygonum Articulatum; *Jointed-spike Polygonum.* Spikes jointed, panicled; stipules sheathing, truncated; root annual, small, fibrous; stem a foot high, with alternate branches towards the top, subdivided into a flowering panicle.—Native of Canada.

21. Polygonum Divaricatum; *Divaricated Polygonum.* Flowers racemed; leaves lanceolate, smooth; stem divaricated, patulous. Root perennial, creeping, composed of many strong woody fibres; stems about three feet high, divided into many confused branches, which are generally bent at each joint; leaves clustered, stalked; flowers large, uniformly white.—This beautiful species is a native of Siberia, Switzerland, Corsica, Dauphiny, and Piedmont, if we may suppose different authors mean the same plant, though there is great hazard of their not coinciding exactly.

22. Polygonum Undulatum; *Wave-leaved Polygonum.* Flowers racemed; leaves lanceolate, acuminate, waved.—This very much resembles the preceding.—Perennial, and a native of Siberia.

23. Polygonum Serratum; *Notch-leaved Polygonum.* Leaves crenate.—Native of Barbary.

***** Helxine, *with subcordate Leaves.*

24. Polygonum Chinensis; *Chinese Polygonum.* Flowers octandrous, trigynous; peduncles rugged; leaves ovate; bractes cordate; stem four-cornered, smooth, even, grooved, decumbent.—Native of the East Indies, China, and Japan. In the two latter countries it is cultivated for dyeing, and produces a beautiful blue colour much like that from Indigo. The leaves are dried, then pounded, and made into small cakes; with these it is said they dye linen, silk, and cotton. When they boil them for use, they add ashes: the stronger the decoction is made, the darker is the blue colour obtained; and the weaker the decoction, the lighter the colour.

25. Polygonum Sagittatum; *Prickly Polygonum.* Leaves sagittate; stem prickly; branches alternate, four-cornered, the corners sharp, prickly backwards, smooth, almost upright, a foot long. Linneus observes, that it sometimes climbs up shrubs.—Native of North America, Siberia, and Japan.

26. Polygonum Arifolium; *Arum-leaved Polygonum.* Leaves hastate; stem prickly; flowers on the branches entirely aggregate; stigmas globular; seeds smooth and even, with the angles entire.—Native of Virginia, Florida, and Japan.

27. Polygonum Crassifolium; *Thick-leaved Polygonum.* Flowers octandrous, trigynous; leaves hastate, fleshy; stem decumbent, unarmed. This is a smallish plant, scarce more than a span long.—Native place uncertain.

28. Polygonum Perfoliatum; *Perfoliate Polygonum.* Leaves triangular; stem prickly; stipules perfoliate, leafy, spreading, roundish.—Native place uncertain.

29. Polygonum Tataricum; *Tartarian Polygonum.* Leaves cordate-sagittate; stem unarmed, erect; seeds somewhat toothed; root annual; flowers white, on many-flowered, axillary, and terminating peduncles, with oblong curved common involucres.—Native of Tartary and China.

30. Polygonum Fagopyrum; *Common Buck-wheat.* Leaves cordate-sagittate; stems almost upright, unarmed; angles of the seeds equal. Root annual, fibrous; herb succulent, a foot or two high, with a zigzag, round, branched, leafy stem; racemes of flowers axillary and terminating, panicled, upright, shorter than the leaves, on slender peduncles an inch or more in length. The flowers make a handsome appearance, and are either quite white, or tinged with red; with the latter of which they become more deeply coloured. Buck-wheat was supposed to have come originally from Africa, but it is now generally allowed that we derived it from Asia. In China and Japan, the flour is frequently made into cakes. It is not indigenous in Europe, though it has found its way into most European Floræ, and occurs on dunghills, and about cultivated fields. It flowers in July and August. The flour is made into thin cakes, called crumpets, in some parts of England; and they are supposed to be nutritious, and not apt to turn sour upon the stomach. The seed is excellent for horses, either whole or broken, mixed with bran, chaff, or grains. A bushel goes farther than two bushels of oats, and, mixed with at least four times as much bran, will be full feed for any horse for a week. Four bushels of the meal, put up at four hundred weight, will fat a hog of sixteen or twenty stone in three weeks, giving him, afterwards, three bushels of Indian Corn, or Hog Peas, broken in a mill, and then mixed with plenty of water. Eight bushels of Buck-wheat meal will go as far as twelve bushels of Barley meal. Mortimer recommends to feed the plant off with milch cows, just before it blossoms, because it flushes them with milk. The seeds are excellent food for poultry; but sheep, feeding on the green herb, are said to become unhealthy. Duhamel advises the removal of bee-hives, in the autumn, to situations where plenty of this plant is sown, as a field of Buck-wheat affords a rich repast for those interesting insects, the bees, in late and dreary parts of the season. This crop is not so common in England as upon the continent; but there is more grown in Norfolk than in any other county. Its principal use is to cleanse foul land, and for ploughing in as a manure, when it is fully grown. In a dry summer it is good fodder; and, as a crop, it will produce an equal quantity with Oats, and sell for more money. The farmer may sow any crop after it, especially Wheat. Winter tares may be sowed in September, and mowed off as soon as convenient in the spring; then Buck-wheat may be sown the second week in May, and ploughed in when in flower, which will be about the second week in July; lastly, sow Wheat, each on one earth; or seed Turnip may be rolled in, harrowing with a light bush-harrow. Making Turnips succeed Buck-wheat ploughed, is good husbandry on light lands, where there is a difficulty in procuring manure; and upon heavy strong lands, that have been long under the plough, with two crops and a fallow. Clay land, well pulverized, always produces a heavy crop of Buck-wheat, when sown in the month of June, provided the summer proves tolerably dry after the sowing. There is no better way of laying down light lands to grass, than in the month of June, to let Buck-wheat, with Grass seeds, follow Swedish Turnips. Twelve pounds of White Clover, and eight pounds of Yellow Trefoil, may be sown upon an acre. One bushel is sufficient to sow an acre, but some go as far as two bushels. After Buck-wheat is mown, it must lie several days, till the stalk be withered, before it be housed. It is in no danger of the seeds falling, nor does it suffer much by wet. It yields fifty or sixty bushels upon an acre, in good land.

31. Polygonum Convolvulus; *Climbing Buck-wheat,* or *Black Bind-weed.* Leaves cordate-sagittate; stem twining, angular; calicine segments bluntly keeled. Root annual, fibrous, of a brown colour; the stem twining about corn and other plants to the height of two or three feet, roughish, and somewhat branched; leaves pale green, smooth, entire, stalked; racemes peduncled, interrupted, having small leaves on them; (Dr. Withering, who calls them flowering spikes, observes, that they are longer than the leaves;) flowers in bundles, nodding, white, on the outside green and purple; the three outer segments bluntly keeled, and not having the keel dilated. The seeds afford excellent food for small birds. They are, indeed, as good for use as those of the preceding species, if dependence may be placed on the representations of various authors, who agree that it produces more in quantity, and bears the cold better. It flowers from June to September.—Native of most parts of Europe, Siberia, and Japan, in corn-fields, gardens, and hedges.

32. Polygonum Multiflorum; *Many-flowered Polygonum.* Leaves cordate; stem twining, angular; panicle of flowers branched; root tuberous, somewhat fleshy, fibrous, white.—Native of Japan, where the root is esteemed as a cordial, and is used for that purpose raw; but it is said to taste best when roasted in the embers.

33. Polygonum Dumetorum; *Bush Buck-wheat.* Leaves cordate; stem twining, even; flowers keel-winged; root annual. It is distinguished from the thirty-first species, by having a longer and more twining stem, and by not being striated. The lobes at the base of the leaves are more rounded; and the flowers are rather panicled than racemed.—Native of Germany, Switzerland, France, and Siberia, in shady bushy places.

34. Polygonum Scandens; *Climbing Polygonum.* Leaves cordate; stem erect, scandent. The numerous flowers come out from the upper axils in spikes three inches long, on a very short peduncle; they are round, flat, swelled out in the middle, and green, having a thin white membrane round them, like a Parsnep seed: when the seed is ripe, these membranes become somewhat larger, and the protuberant part in the middle turns brown. Perennial; flowering in August and September.—Native of America.

35. Polygonum Ciliatum. Flowers octandrous, trigynous; stipules striated, blunt, ciliate; spikes very short; stem herbaceous, simple, four-cornered, upright, slender, a foot and half high.—Native of China.

36. Polygonum Odoratum. Flowers octandrous, trigynous; spikes long, terminating; root creeping; stem herbaceous, one foot high, nearly upright, simple.—Native of Cochinchina, in moist places, and cultivated all over the country as excellent sauce for fish.

37. Polygonum Cilinode. Flowers octandrous, semitrigynous; leaves cordate; stalk angular, prostrate or climbing, slightly rough; segments of the calix obtusely carinated.—Grows in hedges and fields from Canada to New York, and flowers in July.

Polymnia; a genus of the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common, exterior, spreading, larger, four or five leaved, with ovate leaflets; superior eight or ten leaved, with boat-shaped erect leaflets. *Corolla:* compound, radiate; corollets hermaphrodite, many in the disk; female five or ten in the ray; proper of the hermaphrodite funnel-form, five-cleft; of the female ligulate, two or three toothed. *Stamina:* in the her-

maphrodites, filamenta five; antheræ cylindric, tubular, a little longer than the corolla. *Pistil:* in the hermaphrodites, germen very small; style filiform, the length of the stamina; stigma blunt: in the females, germen ovate, biggish; style filiform, the length of the tube; stigmas two, acute. *Pericarp:* none; the calix unchanged. *Seed:* in the hermaphrodites, none; in the females, solitary, obovate, gibbous, somewhat angular inwards, naked; receptacle chaffy, convex, imbricate; chaffs ovate, obtuse, the length of the florets, concave. ESSENTIAL CHARACTER. *Calix:* exterior four or five leaved; interior ten-leaved, the leaflets concave. *Down:* none. *Receptacle:* chaffy.——The species are,

1. Polymnia Canadensis; *Canadian Polymnia.* Leaves alternate, hastate-sinuate. This has an abiding root, which sends up many tall stalks, sometimes nearly ten feet in height; flowers of a pale yellow colour, and sessile. It grows naturally in several parts of North America; flowering in June and July.—This and the next species are both propagated by seeds, procured from the country where they grow. If they arrive from those countries in the spring, and are then sown, the plants seldom come up till the following spring; whereas if they could be obtained in November, and were immediately sown, the plants would appear in the following spring. Sow the seeds in a bed of light ground in the open air; when the plants come up, thin them, and keep them clean till the following autumn; then take the roots up carefully, and transplant them where they are to remain, allowing each plant at least three feet. Keep them clean, and dig about them every spring.

2. Polymnia Uvedalia; *Broad-leaved Polymnia.* Leaves opposite, hastate-sinuate. Root perennial, running deep in the ground, sending up many stalks in proportion to their size in the spring. These stalks in good moist ground rise nearly ten feet high. Stems terminated by a cluster of yellow flowers sitting close, having very short footstalks. The flowers appear in October, too late to produce seeds here, and the stalks decay in winter.—Native of Virginia.

3. Polymnia Tetragonotheca; *Narrow-leaved Polymnia.* Leaves opposite, spatulate, subdentated. Root perennial; stems about two feet and a half high, branching towards the top. Each of the branches has one large yellow flower at the end, shaped like a Sun-flower; before it expands, covered with the inflated four-cornered calix. The seeds rarely ripen in England, and the stems perish in autumn.—Native of Carolina. Sow the seeds as directed for the preceding, and manage it in the same manner. The roots will abide through the winter in the open ground, in a warm situation. In very severe weather they should be covered with rotten tan, or pease-haulm. They will live three years, but as they do not increase, it will be best to procure seeds annually from abroad.

4. Polymnia Abyssinica; *Upright Polymnia.* Leaves opposite, sessile, oblong, lanceolate, subdentated; calices five-parted; all the florets seminiferous. Root annual or biennial; stem herbaceous, from two to six feet high, round, the thickness of a finger, rugged, dotted with oval, convex, brownish dots, sparingly branched at top; leaves two or three inches long, toothed in some parts, entire in others, clasping the stem with their dilated base; flowers terminal, stalked; corolla yellow. It flowers here in April and May. —Native of Abyssinia.

5. Polymnia Wedelia. Leaves lanceolate; stem shrubby. This is a shrubby scandent plant, with round, smooth, woody, slender, branched, brachiate stems; peduncles one-flowered, solitary, subterminating; new branchlets springing out at their base; flowers yellow, less than an inch in diameter.—Native of Carthagena in New Spain.

Polypodium; a genus of the class Cryptogamia, order Filices.—GENERIC CHARACTER. *Capsules:* annulated, distributed in roundish dots, on the back or lower surface of the frond. *Involucrum:* entirely wanting.—The investigation of species in this extensive genus is attended with difficulties, from their general resemblance in habit, the difference of their appearance at different ages, and the defect of their specific characters. Authors have not always used accurate terms in describing the fronds; and to remedy this, the plants should not be gathered until they are in a state of full fructification. The attention should then be most particularly directed to the lower parts of the fronds or pinnas, for there the characters are most constant and observable, the extreme parts generally running together so as to baffle every attempt at description. We have only eighteen species in England, and very few more are found in Europe; so that being generally described from dried specimens brought from remote countries, many inaccuracies have unavoidably crept in.—The Common Polypody, and all the other sorts which are hardy enough to bear the open air, being perennial plants, may be propagated by parting their roots in the spring before they shoot, and should be planted in a poor moist soil under the shade of a wall, for if exposed to the sun they will not thrive. Many of them grow out of the joints of walls and old buildings, and the fissures of rocks, but are commonly found exposed to the north. They are therefore well adapted for rockwork.——The species are,

* *Frond undivided.*

1. Polypodium Lanceolatum; *Lance-leaved Polypody.* Fronds lanceolate, quite entire, smooth; fructifications solitary; shoots naked.—Native of South America.

2. Polypodium Lycopodioides. Fronds lanceolate, quite entire, smooth; fructifications solitary; shoot scaly, creeping; stems very long, slender, and compressed, fixing themselves to trees like Ivy, and putting out many short and long branches.—Native of the West Indies; found at Jamaica, Martinico, and Domingo.

3. Polypodium Angustifolium; *Narrow-leaved Polypody.* Fronds linear, lanceolate, very long, acuminate, rigid, with a convex margin; fructifications scattered, short, creeping. —Native of Jamaica.

4. Polypodium Gramineum; *Grassy Polypody.* Fronds acuminate, quite entire, smooth; fructifications solitary; shoot naked.—Native of Jamaica.

5. Polypodium Marginellum; *Margined Polypody.* Fronds wedge-shaped, linear, blunt, margined, smooth; fructifications solitary, crowded; shoot very short, naked.—Native of Jamaica.

6. Polypodium Repens; *Creeping Polypody.* Fronds lanceolate, acuminate, smooth, entire; fructifications scattered; shoot creeping.—Native of Jamaica.

7. Polypodium Serpens; *Rooting Polypody.* Fronds lanceolate, linear, smooth, somewhat waved; fructifications solitary; shoot hirsute, rooting.—Native of Hispaniola.

8. Polypodium Acrostichoides. Fronds linear, entire, smooth; fructifications crowded.—Native of the Society Islands.

9. Polypodium Stellatum; *Starry Polypody.* Fronds lanceolate, linear, blunt, quite entire, hoary underneath; fructifications solitary; shoots creeping, hirsute.—Native of New Zealand.

10. Polypodium Piloselloides; *Mouse-ear Polypody.* Fronds lanceolate, quite entire, rough-haired, the barren ones ovate, fertile, lanceolate; fructifications solitary; root creeping, mossy. Browne says it creeps along the ground, and casts its small oval leaves on both sides, in an alternate order;

these seldom exceed an inch and quarter in length, and lie commonly close upon the ground, or on rocks.—Native of South America, and Jamaica, but rare in that island.

11. Polypodium Immersum; *Immerse-fruited Polypody.* Fronds oblong, lanceolate or oblong, very blunt, acute at the base, quite entire, smooth; fructifications in rows, immersed.—Native of the East Indies.

12. Polypodium Heterophyllum; *Various-leaved Polypody.* Fronds crenate, smooth, the barren ones roundish, sessile, the fertile ones lanceolate; fructifications solitary.—Native of South America.

13. Polypodium Crassifolium; *Thick-leaved Polypody.* Fronds lanceolate, smooth, quite entire; fructifications in rows.—Native of South America.

14. Polypodium Phyllitidis. Fronds lanceolate, smooth, quite entire; fructifications scattered.—This grows in South America and Jamaica, on the trunks of old trees, like our common Polypody.

15. Polypodium Comosum; *Many-cleft Polypody.* Fronds lanceolate, smooth, quite entire, multifid at the top: fructifications scattered.—Native of South America.

16. Polypodium Trifurcatum; *Three-cleft Polypody.* Fronds lanceolate, smooth, repand-sinuate, three-lobed at top.—Native of South America. This, like the preceding, is suspected to be nearly allied to the fourteenth species.

17. Polypodium Lineare. Fronds linear-lanceolate, entire, smooth; fructifications solitary.—Native of Japan, flowering there in October.

18. Polypodium Ensatum; *Sword-leaved Polypody.* Frond elliptic, ensiform, smooth, entire; fructifications scattered. —Native of Japan.

** *Frond pinnatifid, with the Lobes coadunate.*

19. Polypodium Pica. Frond simple, cordate, three-lobed; lobes lanceolate, subulate, eared at the base, the middle one elongated.—Native of Madagascar.

20. Polypodium Phymatoides. Fronds simple, bifid, or five-lobed, lanceolate, above the fructifications warted.—Native of the East Indies.

21. Polypodium Pendulum; *Pendulous Polypody.* Fronds pinnatifid, subsessile, smooth, pendulous; lobes oblong, bluntish.—Native of Jamaica.

22. Polypodium Hastatum; *Hastate-leaved Polypody.* Frond trifid, hastate.—Native of Japan.

23. Polypodium Crispatum; *Curl-leaved Polypody.* Fronds pinnatifid, smooth; lobes semi-orbicular, crenate.—Native of South America.

24. Polypodium Incisum; *Gash-leaved Polypody.* Fronds lanoeolate, pinnatifid; lobes rounded, the lower cleft and united.—Native of Jamaica.

25. Polypodium Trichomanoides. Fronds pinnatifid, somewhat hairy; lobes semiovate, obtuse.—Native of Jamaica.

26. Polypodium Myosuroides. Fronds pinnatifid, smooth; lobes united into a lanceolate top, fructiferous, the lower ones remote.—Native of Jamaica.

27. Polypodium Suspensum. Fronds pinnatifid, smooth; lobes semi-acute.—Native of South America.

28. Polypodium Asplenifolium. Fronds pinnatifid, hairy; lobes semi-acute.—Native of South America.

29. Polypodium Vulgare; *Common Polypody.* Fronds pinnatifid; pinnas oblong, subserrate, blunt; root scaly. The lower pinnas are frequently barren. The thick roots are clothed with long, chaffy, rusty, or golden scales; and the fronds are erect, a span high, including their stalks, rather glaucous beneath; with large golden copious dots of capsules. The root was employed as a purgative by the ancients, and being thought useful in expelling bile and pituitous humours, was recommended in insanity and melancholy; though, to act as a cathartic, the root must be given in its recent state, and in a large dose. As a pectoral, it seems to promise more advantage; and, joined with liquorice, has produced good effects in coughs and asthmatic affections. Withering observes, that the root is sweetish to the taste, but by long boiling it becomes bitter. When fresh it is a gentle purgative, and the best way of taking it is in an infusion; six drachms of the root is a sufficient quantity for a pint of boiling water, and that is enough for two doses. Meyrick also asserts, that the root is a safe and gentle purgative, and may be taken either in an infusion or decoction, in which forms it generally operates by urine as well as stool. It is serviceable in the jaundice and dropsy, and is likewise an excellent ingredient in diet-drinks for scorbutic disorders. —It is very common throughout Europe, in woods and shady lanes, on the old stumps of trees, and on rocks and walls; in fructification from June to October. There are several varieties: the most remarkable is that which has been long noticed under the name of Welsh Polypody, and which Linneus and some others consider as a distinct species. In it the pinnas are pinnatifid, and the lobes serrate; and therefore is certainly, says Lightfoot, only a variety of the common sort, as I have had frequent opportunities of determining by observing its different gradations. In this state it is analogous to a double flower among the more perfect plants; and therefore never produced fructifications. This is also observed in a variety of *Asplenium Scolopendrum*, which see.

30. Polypodium Virginianum; *Virginian Polypody.* Fronds pinnatifid; pinnas oblong, subserrate, blunt; root smooth. —Native of Virginia.

31. Polypodium Otites. Fronds pinnatifid; lobes lanceolate, alternate, blunt, distant.—Native of America.

32. Polypodium Incanum; *Hoary Polypody.* Fronds pinnatifid; pinnas lanceolate, blunt, distant, spreading, entire underneath, and on the stipe hoary scaleletted. It rises in tufts, and seldom exceeds ten or twelve inches in length.—Native of Jamaica, in low, cool, and shady places.

33. Polypodium Pustulatum. Fronds pinnatifid, even; pinnas oblong, entire, acuminate.—Native of Jamaica.

34. Polypodium Scandens; *Scandent Polypody.* Fronds pinnatifid, even; pinnas linear, blunt, waved, distant; runners rooting, scandent.—Native of Jamaica.

35. Polypodium Pectinatum. Fronds pinnatifid, lanceolate; lobes approximating, ensiform, parallel, acute, horizontal; root naked.—Native of Jamaica and Egypt.

36. Polypodium Taxifolium; *Yew-leaved Polypody.* Fronds pinnatifid; lobes approximating, ensiform, parallel, acute, ascending; root rough-haired.—Native of South America.

37. Polypodium Struthiopis; *Ostrich-feathered Polypody.* Fronds pinnatifid; lobes approximating, ensiform, repand, horizontal. The whole figure of the frond resembles an ostrich feather, except in being more flat together, though each segment is wavy.—Native of South America.

38. Polypodium Squamatum; *Scaly Polypody.* Fronds pinnatifid, rugged; pinnas lanceolate, distant, horizontal, quite entire.—Native of South America.

39. Polypodium Loriceum. Fronds pinnatifid, even; pinnas lanceolate, distant, horizontal, repand.—Native of South America.

40. Polypodium Alatum; *Winged Polypody.* Fronds pinnatifid, even; pinnas oblong, distant, toothed.—Native of South America.

41. Polypodium Ellipticum; *Elliptic-leaved Polypody.* Fronds pinnatifid; pinnas elliptic, even, entire; shoot creeping.—Native of Japan.

42. Polypodium Aureum; *Golden Polypody.* Fronds pinnatifid, smooth, and even; pinnas oblong, distant, the lowest patulous, the terminating one very large; fructifications in rows. It flowers in March.—Native of Jamaica and Martinico, on the trunks of large trees.

43. Polypodium Quercifolium; *Oak-leaved Polypody.* Barren fronds sessile, shorter, blunt, sinuate, fruiting; fronds alternate; pinnas lanceolate.—Native of the East Indies.

*** *Frond trifoliate; Peduncle with three Leaflets.*

44. Polypodium Trifoliatum; *Three-leaved Polypody.* Fronds ternate, sinuate, lobed, the middle ones larger.—Native of the West Indies.

**** *Frond pinnate.*

45. Polypodium Lonchitis; *Rough Polypody,* or *Spleenwort.* Fronds pinnate; pinnas crescent-shaped, ciliate-serrate, declined; stipes strigose. Dr. Withering observes, that this plant is about four inches long and an inch broad, generally curved, and that the larger serratures of the pinnas end in semi-transparent thorns.—Native of Britain, Norway, Switzerland, Dauphiny, Carniola, Monte Baldo, and Virginia. In Wales it is found on the highest mountains of Caernarvonshire; on Glydar, near Llanberys; and in Scotland at the foot of the rocks among the Highland mountains.

46. Polypodium Muricatum; *Thorny-leaved Polypody.* Fronds pinnate; pinnas falcate-lanceolate, subserrate, eared upwards, at bottom and in front spiny; stipe scaly.—Native of Jamaica.

47. Polypodium Semicordatum; *Half-heart-leaved Polypody.* Frond pinnate; pinnas parallel, lanceolate, very smooth, obliquely cordate at the base; the lower lobe more gibbous; fructifications in four rows.—Native of Jamaica.

48. Polypodium Sagittatum; *Arrow-leaved Polypody.* Frond pinnate; pinnas lanceolate, blunt, entire, having a toothlet on each side at the base, the lower one mutilated, triangular, minute.—Native of Jamaica.

49. Polypodium Exaltatum; *Lofty Polypody.* Fronds pinnate; pinnas ensiform, entire, gibbous at the base inwards, at the upper base upwards.—Native of Jamaica, and the continent of South America.

50. Polypodium Rhizophyllum; *Rooting-leaved Polypody.* Fronds pinnate, decumbent, trailed at the tip, the fruiting ones rooting; pinnas ovate-deltoid.—Native of Jamaica.

51. Polypodium Auriculatum; *Eared Polypody.* Fronds pinnate; pinnas falcate-lanceolate, serrate, truncate at the base, cared upwards.—Native of the East Indies.

52. Polypodium Unitum. Fronds pinnate; pinnas ensiform, serrate; serratures semiovate, nerved.—Native of the East Indies.

53. Polypodium Sophoroides. Fronds pinnate; pinnas ensiform, gash-serrate; serratures semiovate, nerved, the lowest serrature longer above.—Native of Japan.

54. Polypodium Triangulare. Frond pinnate; pinnas triangular, toothed.—Native of South America.

55. Polypodium Obliteratum. Frond pinnate; pinnas alternate, broad-lanceolate, attenuated, crenate, notched at the tip and base, obliterated on both sides.—Native of Jamaica.

56. Polypodium Crenatum; *Notch-leaved Polypody.* Frond pinnate; pinnas oblong-lanceolate, crenate, smooth; fructifications in double rows. A noble Fern, whose stalks are erect, angular, one or two feet high: fronds nearly as long, of a few large leaflets beset with a row of small dots of capsules on each side of every transverse vein.—Native of Jamaica and Hispaniola.

57. Polypodium Cordifolium; *Heart-leaved Polypody.* Fronds pinnate; pinnas cordate, blunt, quite entire, repand.—Native of America.

58. Polypodium Simile. Fronds pinnate; pinnas lanceolate, quite entire, distant; the upper ones smaller; dots in rows. Plant three feet high, upright.—Native of America and China.

59. Polypodium Dissimile. Fronds pinnate; pinnas lanceolate, subpubescent, confluent, the lower ones distinct; dots scattered.—Native of Jamaica.

60. Polypodium Serra; *Saw-leaved Polypody.* Frond bipinnatifid; pinnas linear, very long, attenuated, serrate; serratures semiovate, acute, striated.—Native of Jamaica.

61. Polypodium Tetragonum; *Square-stalked Polypody.* Fronds bipinnatifid; pinnas lanceolate, acuminate, opposite, distant, horizontal; segments ovate, bluntish; stipe four-cornered.—Native of Jamaica.

62. Polypodium Sanctum. Fronds subbipinnate; upper pinnas coadunate; lower linear, blunt, entire; lowest biggest, acute, crenate.—Native of Jamaica. See *Acrostichum Sanctum;* they are the same.

63. Polypodium Reticulatum; *Netted-leaved Polypody.* Fronds pinnate; pinnas oblong, quite entire, anastomosing, rectangular; dots rectangular, approximating.—Native of America.

64. Polypodium Deltoideum; *Deltoid Polypody.* Frond bipinnatifid; lower pinnas abbreviated, entire, oblong, deltoid, reflex.—Native of Jamaica.

65. Polypodium Cicutarium. Fronds ternate; leaflets bipinnate, laciniate at the base, bluntly gash-serrate, acuminate, the lowest more gibbous. These little plants rise three or four together from a tufted fibrous root.—Native of Virginia and Jamaica.

66. Polypodium Fontanum; *Rock Polypody.* Fronds pinnate, lanceolate; leaflets roundish, sharply gashed; stipe even. Dr. Smith has removed this species into the genus *Cyathea.*—Native of England, Germany, Switzerland, the south of France, Piedmont, and Siberia, upon moist shady rocks. It is found above Hammersham church; and near Wyburne in Westmoreland; and also in Buckinghamshire.

67. Polypodium Falcatum; *Sickle-leaved Polypody.* Fronds pinnate; pinnas cordate, falcate, acuminate, entire; fructifications approximating, scattered. This resembles the forty-fifth species, but the frond is larger, the leaflets on petioles, though very short ones, more pointed, and very bluntly serrate.—Native of Japan.

68. Polypodium Marginale. Fronds pinnate; upper pinnas coalescent; lower ensiform, eared upwards, gashed; stipe villose.—Native of Japan.

70. Polypodium Hirsutulum. Fronds pinnate; pinnas oblong, bluntly serrate, eared upwards at the base.—Native of the Society Isles.

71. Polypodium Tenellum. Fronds pinnate; leaflets alternate, remote, linear, acuminate, waved.—Native of the islands in the South Sea.

72. Polypodium Dissectum. Fronds pinnate; leaflets pinnatifid; pinnules oblong, bluntly serrate, the lower ones longer, scarcely coalescent.—Native of the islands in the South Sea.

73. Polypodium Nymphale. Fronds pinnate, pubescent; leaflets linear, very long, pointed, serrate, pinnatifid at the base; segments oblong, blunt, scarcely falcated forwards.—Native of the islands in the South Sea.

74. Polypodium Invisum. Fronds pinnate, smooth; leaflets linear, very long, pointed, serrate, pinnate; pinnas lanceolate, falcate, acute, connate at the base.—Native of New Zealand.

75. Polypodium Pennigerum. Fronds pinnate, smooth; leaflets linear, very long, pointed, subpinnate; pinnas ovate, oblong.—Native of New Zealand.

76. Polypodium Erectum. Fronds pinnate; pinnas opposite, oblong, at the top linear, acuminate, serrate; fructifications in a continued line along the margin.—Native of the Society Isles.

***** *Frond bipinnate*, or *subbipinnate*.

77. Polypodium Phegopteris; *Wood Polypody*. Frond pinnate; leaflets lanceolate, pointed, pinnatifid, combined at the base, the lowermost pair deflexed. The root is creeping; the fronds about a foot high, pale green, with long pale stalks. The drooping posture of the two lower leaflets constitutes the most striking character.—Native of most parts of Europe, and of Virginia, in the clefts of rocks, moist and shady places, and woods. With us in Devonshire, Yorkshire, Westmoreland; as at Barrowfield wood near Kendal; and by the fall of Lodore near Derwentwater; also in the lowlands of Scotland about Langholm, and Panton bridge in Eskdale.

78. Polypodium Retroflexum. Fronds subbipinnate; lowest leaflets reflex; pinnas jagged.—Native of America.

79. Polypodium Fragrans; *Sweet Polypody*. Fronds bipinnate; pinnas ovate, sublobed, blunt, naked underneath, bent back at the edge; fructifications marginal; stock dark purple, smooth and even, with pale red chaffs towards the base. When fresh dried, this species is extremely fragrant.—Native of the south of Europe; known also in the East Indies.

80. Polypodium Parasiticum; *Parasitical Polypody*. Fronds semibipinnate, lanceolate; lobes rounded, quite entire, striated.—Native of the E. Indies, on trees. Found also in Java.

81. Polypodium Varium. Fronds lateral, bipinnate; lowest leaflet pinnatifid.—Native of China.

82. Polypodium Cristatum; *Crested Polypody*. Fronds subbipinnate; leaflets ovate, oblong; pinnas bluntish, sharply serrate at the tip.—Found in moist woods and shady places in a gravelly soil, in chinks of moist rocks, on old walls, and in marshy places at the foot of decaying oaks, in the north of Europe.

83. Polypodium Patens; *Pubescent Polypody*. Frond bipinnatifid, somewhat villose underneath; pinnas linear-lanceolate, elongated; pinnules oblong, acute, entire, the lowest longer.—Native of Jamaica, on the banks of the Rio Cobra.

84. Polypodium Filix Mas; *Male Polypody*, or *Fern*. Fronds bipinnate; pinnas obtuse, crenulate; stipe chaffy.—This is a native of Britain, growing about the borders of woods near rivulets, and in stony rocky places. Male Fern seems to have the same qualities with the *Pteris Aquilina*, or Common Brake. Both are burnt for their ashes, which are sold to soap and glass makers. The bishop of Drontheim relates, that the curled leaves, at their first appearance, are boiled and eaten like Asparagus; and that the poorer Norwegians cut off those succulent laminæ like the nails of the finger, at the crown of the root, which are the bases of the future stalks, and brew them into beer, adding a third part of malt; and in times of great scarcity they mix it with their bread. The same author adds, that, cut green, and dried in the open air, it affords not only an excellent bitter, but, infused in hot water, becomes no contemptible fodder to goats, sheep, &c. which will readily eat, and sometimes grow fat upon it. The root has been greatly celebrated for its effects upon the tænia or tape-worm; and this quality was known to the ancients, though, notwithstanding its subsequent recommendation by Hoffman, it was generally neglected, till Madame Noufer, a surgeon's widow in Switzerland, employed a secret remedy as a specific in the cure of the tape-worm. The principal physicians at Paris being deputed to make a complete trial of its efficacy, it was purchased by the king of France, and afterwards published by his order. After the patient has been prepared by an emollient clyster, and a supper of panada, with butter and salt, he is directed to take in the morning, while in bed, a dose of two or three drachms of the powdered root, one drachm being the dose for infants. The powder must be washed down with a draught of water, and two hours after a strong cathartic of calomel and scammony is to be given, proportioned to the strength of the patient. If this does not operate in due time, it is to be followed by a dose of purging salts; and if the worm be not expelled in a few hours, the process is to be repeated at proper intervals. That this treatment has been successful, there is abundant evidence; but whether the Fern root, or strong cathartic, is the principal agent in destroying the worm, has been doubted, although it does appear from experiments made in Germany, that the tape-worm has been expelled by giving the root repeatedly without the addition of any purgative. Meyrick says, the roots when chewed are at first sweetish, but soon become nauseous and bitter. Some people make use of them to destroy worms in children, others to remove obstructions of the viscera, and a third class to cure the rickets.

85. Polypodium Filix Fœmina; *Female Polypody*, or *Fern*. Fronds bipinnate; pinnules lanceolate, pinnatifid, acute; stalk waved, smooth, sometimes scaly.—Native of the northern and some of the more southern parts of Europe, in moist and shady marshes, woods, and heaths, near rivulets. It is however by no means so common as the preceding.

86. Polypodium Oreopteris; *Mountain Polypody*. Fronds subbipinnate; pinnas alternate; pinnules quite entire, lanceolate, bluntish; fructifications marginal; root scaly. Some of the most remarkable particulars in which this species differs from the following and from the eighty-third species, with both of which it has been confounded, are these: first, the eighty-seventh species has a small creeping root, but this a large scaly root wrapped and tied together with small strong fibres, which cannot be separated without difficulty. Secondly, when the former grows old, the under side of the leaf is totally covered with the confluent fructifications, and the edges of the pinnules are reflexed or contracted: in the latter the fructifications are always on the margins, both in a young and old state, and never run into one another. Thirdly, this species is four times as large as the following one, which grows in boggy places: whereas this is always found in dry woods and on moors, rarely growing near water. It is said to have an agreeable scent, and is more frequent in mountainous situations than any other species.—It is found both in England and Scotland, but most abundantly in the latter: in woods at Castle Howard and Hornby; in moist woods near Darlington, but never on dry hills in that neighbourhood; in a wood at Old Footswell near Bromsgrove; and on the north side of Shotover-hill.

87. Polypodium Thelypteris; *Marsh Polypody*. Frond bipinnate; pinnas pinnatifid, quite entire, covered with pollen underneath.—Native of the northern parts of Europe in bogs. Found near Bungay in Suffolk; St. Faith's, Newton bogs, near Norwich; and at the foot of Snowden near Llanberys.

88. Polypodium Aculeatum; *Prickly Polypody*. Fronds bipinnate; pinnas lanceolate, ciliate, toothed; stipe strigose.—Native of most parts of Europe, of Barbary, Egypt, &c. in woods and shady places. There is a variety, the leaves of which vary from six inches to a foot in height. It is also found in shady places.

89. Polypodium Hirtum. Frond at bottom tripinnatifid, towards the top bipinnatifid, and finally pinnatifid; segments

ovate, blunt, almost entire; stipe and branches rough-haired. —Native of Jamaica.

90. Polypodium Rhæticum; *Stone Polypody.* Fronds bipinnate; leaflets and pinnas remote, lanceolate; serratures acuminate.—Native of England, France, Germany, Switzerland, Carniola, and Siberia. With us, it abounds in Derbyshire, Westmoreland, Wales, and Scotland.

91. Polypodium Elongatum; *Cut-leaved Polypody.* Fronds bipinnate, smooth; pinnas blunt, sharply serrate, the upper ones ovate, the middle oblong, the lower lanceolate, pinnatifid, sharpish.—Native of Madeira and the Azores.

92. Polypodium Noveboracense. Fronds bipinnate; pinnas oblong, quite entire, parallel; stipe even.—Found in Canada.

93. Polypodium Pubescens. Fronds bipinnate, hairy; pinnas lanceolate-ovate, somewhat gashed, acute; the outmost confluent.—Native of Jamaica, but not common there.

94. Polypodium Marginale; *Marginal-flowering Polypody.* Fronds bipinnate; pinnas sinuate, repand at the base; fructifications marginal.—Native of Canada.

95. Polypodium Bulbiferum; *Bulbiferous Polypody.* Fronds bipinnate; leaflets remote; pinnas oblong, obtuse, serrate, bulbiferous underneath. Among the fructifications are round globules, first green, then black, of a sweetish taste, like the root of the Common Polypody: when ripe, according to Cornutus, they fall to the ground and strike root; from which circumstance, Linneus calls them bulbs. Bobart rather conceives these globules, bulbs, or tubers, to be the work of insects, because it is unusual to find two sorts of seeds on the same plant; but there are several plants which increase both by seeds and bulbs.—Native of Canada.

96. Polypodium Fragile; *Brittle Polypody.* Fronds bipinnate; leaflets remote; pinnas roundish, gashed. According to Dr. Smith, who makes this a *Cyathea*, the frond is bipinnate and pinnatifid, its segments obovate and notched, the stalk winged, the flowers scattered, and the calix torn. Dr. Withering has three varieties, but they have been all gathered from the same root.—Native of Europe, on rocks. In England it is found at Peak's Hole, and on walls about Buxton in Derbyshire; near Hyde, in Gloucestershire; in the road from Bourn Heath to Worms Ash, near Bromsgrove; and in Wales and Scotland.

97. Polypodium Regium. Fronds bipinnate; leaflets subopposite; pinnas alternate, laciniate.—Native of Carniola, France, and Piedmont.

98. Polypodium Leptophyllum; *Fine-leaved Polypody.* Fronds bipinnate, the barren ones very short; pinnas cuneiform, lobate. This is a smooth, delicate, and almost diaphanous plant. Linneus, who doubted whether it were a *Polypodium*, says it is a middle species between this genus and those of *Acrostichum* and *Osmunda*. Magnol and Barrelier make it an *Adiantium*; and Swartz affirms it to be a genuine *Asplenium*, with bipinnate and tripinnatifid fronds, remote pinnas, and cuneiform, gashed, lobed, and solitary fructifications.—Native of Spain, Portugal, Provence, and Algiers, in the fissures of rocks.

99. Polypodium Barometz; *Scythian Lamb Polypody.* Fronds bipinnate; pinnas pinnatifid, lanceolate, serrate; roots woolly.—Native of Tartary, China, and Cochin-china. Many authors have written upon this very singular plant, and most of them fabulously. Some have given a figure of it much resembling a lamb, as the fruit of some plant, on the top of a stalk. It is well known, however, to be the root, which, from the variety of its form, is easily turned into the form of a lamb, which the Tartars call Barometz. The root rises above the ground in an oblong form, covered all over with hairs; towards one end it frequently becomes narrower, and then thicker, so as to give somewhat of the shape of a head and neck; and it has sometimes two pendulous hairy excrescences, resembling ears; at the other end a short shoot extends out into a tail; four fronds are chosen in a suitable position, and are cut off to a proper length, to represent the legs: and thus a vegetable lamb or dog is produced, which at a due distance it may be easy to mistake for a real animal. It is scarcely necessary to contradict the fables that have been related of this remarkable Fern root; such as, that no grass will grow near it, the ground appearing as if the lamb had fed it bare. Loureiro, who had an opportunity of examining it in its living state, declares that the root, when first cut, yields a tenacious juice, very like the blood of animals in colour and substance; but that all the other wonderful stories told about it, are fabulous. In the account of this plant, contained in our *Philosophical Transactions*, it is said that the down of the root is commonly taken for spitting of blood, about six grains forming a dose, and three doses pretended to cure such a hæmorrhage: and that in China this down is used for stopping of blood in fresh wounds, as cobwebs are with us, and is so generally esteemed, that few families are ever without it. This down is of a dark yellowish snuff colour, shining like silk, some of it a quarter of an inch long. The celebrated physician and botanist, Dr. Darwin, thus celebrates this peculiar kind of Fern, in his Poem called "The Loves of the Plants."

> "Cradled in snow, and fann'd by Arctic air,
> Shines, gentle *Barometz!* thy golden hair;
> Rooted in earth each cloven hoof descends,
> And round and round her flexile neck she bends;
> Crops the gray coral moss and hoary thyme,
> Or laps with rosy tongue the melting rime;
> Eyes with mute tenderness her distant dam,
> Or seems to bleat, a *vegetable Lamb.*"

100. Polypodium Lacerum. Fronds bipinnate; pinnules sessile; the outmost confluent, falcate, serrate; stipe scaly; root creeping, scaly; scales close, membranaceous, brown, smooth.—Native of Japan.

101. Polypodium Setosum. Fronds bipinnate; pinnules lanceolate, gashed, entire; stipe bristly.—Native of Japan.

102. Polypodium Glaucum. Frond bipartite, bipinnate, glaucous underneath; pinnules gashed, entire.—Native of Japan; flowering in June.

103. Polypodium Dichotomum. Dichotomous: fronds pinnate; pinnas linear-lanceolate, quite entire, horizontal, glaucous underneath. The ashes of this, with powdered alum, are exhibited in aphthas and excoriations of the mouth, in Japan. The New Zealanders suck out the sweetish farinaceous part of the root, having first roasted it, and beat it well with a stone or club.—Native of Jamaica, Japan, and in the dry mountains of New Zealand, and the Society Isles.

****** *Prickly, with scattered Spines, or arborescent.*

104. Polypodium Arboreum; *Tree Polypody.* Fronds bipinnate, serrate; trunk arboreous, unarmed. This Fern rises to the great height of twenty-five feet; it is, like the other Ferns and Palms, furnished only with ribs, which fall off gradually as it rises, while the new shoots spring up from the top. It resembles the Palm tribe also, both in the form and structure of its woody trunk, being very hard immediately under the bark, but loose, soft, and fibrous in the middle. It holds for many years, bears all the inclemencies of the weather, and is often used for posts, where the smaller Palms are not at hand.—Native of South America, Jamaica, Amboyna, and Cochin-china.

105. Polypodium Spinosum. Fronds bipinnate, serrate; trunk arboreous, prickly. It rises to the height of twenty

feet, as large as the human leg, undivided, covered with the ends of the fallen petioles, which are dark brown, as big as the finger, two or three inches long, thick set with short and sharp prickles.—Native of South America, and the islands.

106. Polypodium Horridum. Fronds superdecompound; pinnas semisagittate, connected at the base, serrate at the tip; trunk prickly.—Native of the West Indies.

107. Polypodium Pyramidale. Fronds superdecompound; pinnas terminating, lanceolate, very long, serrate; stipe prickly at bottom.—Native of America.

108. Polypodium Asperum. Fronds superdecompound; pinnas obtuse, serrate at the tip, the terminating ones acuminate; trunk arboreous, prickly.—Native of America.

109. Polypodium Muricatum. Fronds bipinnate; pinnas ovate, toothlet-spiny.—Native of America.

110. Polypodium Villosum. Fronds bipinnate, hirsute; pinnas oblong, obtuse, the terminating ones acuminate.—Native of the West Indies.

111. Polypodium Decussatum. Fronds bipinnate; pinnas horizontal, quite entire, obtuse, the terminating ones lanceolate.—Native of the East Indies.

******* *Frond superdecompound.*

112. Polypodium Axillare; *Slender Polypody.* Frond tripinnate, smooth; pinnas oblong, serrate at the tip, adnate, few-flowered.—Native of the island of Madeira.

113. Polypodium Umbrosum; *Madeira Wood Polypody.* Frond tripinnate, smooth; pinnas lanceolate-linear, serrate, adnate, many-flowered.—Native of Medeira.

114. Polypodium Dryopteris; *Branched Polypody.* Fronds superdecompound; leaflets torn, bipinnate. Root thread-shaped. The plant is from five to eight inches or a foot high. The pinnas do not grow exactly perpendicular, but decline towards the horizon. Fructifications in two rows of round dots upon each lobe. Bolton figures a variety with larger leaves, which he found in White Scars near Ingleton, Yorkshire; and in the Peak of Derbyshire.—The species is a native of many parts of Europe, on rocks, and in shady places. With us, chiefly in the northern counties; as at Cornbury quarry in Oxfordshire; in woods E. N. E. of the road up Frocaster Hill, Gloucestershire; about North Brierly in Yorkshire; among the rocks at the fall of Lodore on the side of Derwentwater, Cumberland; in Barrowfield wood, and other rocky woods near Kendal; in Scotland, at Langholm and Broomholm in Eskdale; about Dunkeld in Stormount; and near Tintern Abbey in Monmouthshire, South Wales.

15. Polypodium Calcareum; *Rigid Three-branched Polypody.* Frond ternate, doubly pinnate, erect, rather rigid; segments obtuse, somewhat crenate; dots confluent.—Native of mountainous heaths, on a calcareous soil: abundant about Matlock bath, Derbyshire.

116. Polypodium Speluncæ. Fronds superdecompound, hairy; leaflets lanceolate, pinnate; pinnas opposite, pinnatifid.—Native of both Indies, Cochin-china, and Egypt.

117. Polypodium Capense; *Cape Polypody.* Frond superdecompound; leaves bipinnate; pinnas one-flowered at the base.—Native of the Cape.

118. Polypodium Æmulum; *Dwarf Madeira Polypody.* Frond quadripinnatifid, smooth; pinnas oblong-linear, gashed; pinnules toothletted at the tip.—Native of Madeira.

119. Polypodium Denticulatum. Frond quadriparite at bottom, at top tripinnate, smooth: pinnules wedge-ovate, gashed, toothletted; fructifications solitary.—Native of Jamaica.

120. Polypodium Armatum; *Armed Polypody.* Fronds quadripinnate; pinnules lanceolate, crenulate, smooth above, hirsute at bottom; fructifications crowded, branched; branchlets rough; trunk arboreous, prickly.—Native of Jamaica.

121. Polypodium Glaucum. Fronds quadripinnate; branches and branchlets lanceolate; pinnas lanceolate, pinnatifid; segments ovate, acute glaucous underneath.—Native of Jamaica.

122. Polypodium Dissectum; *Cut Polypody.* Frond quadripinnatifid, smoothish; pinnules ovate, blunt, gash-serrate; fructifications solitary; branches and branchlets pubescent.—Native of Jamaica.

123. Polypodium Effusum; *Spreading Polypody.* Frond quinquepinnatifid, smoothish, membranaceous; pinnules acute, finely serrate; rachis of the branches margined.—Native of Jamaica.

124. Polypodium Ilvense. Fronds pinnate; leaflets opposite, united, blunt, hairy underneath, very entire at the base; see *Acrostichum Ilvense.*—Found on Ben Lawers in Scotland, and Clogwyn y Garnedd in Wales.

125. Polypodium Arvonicum. Fronds pinnate; leaflets lanceolate, pinnatifid, hairy underneath; stipe hairy.—Found in Wales.

126. Polypodium Dentatum. Fronds pinnate; leaflets opposite, pinnatifid; lobes sparingly cut at the sides, finely toothed at the ends; stipe very slender.—Found in the highlands of Scotland.

127. Polypodium Spinulosum. Fronds bipinnate; pinnas lanceolate; pinnules linear, ovate, with sharp-pointed teeth.—Found on bogs on Birmingham heath, and Holluways in Devonshire.

128. Polypodium Trifidum. Fronds bipinnate; pinnas lanceolate, blunt; pinnules of the lowermost pinnas mostly trifid; stipe bordered.—Found near Denbigh in North Wales.

129. Polypodium Vestitum. Fronds subbipinnate; pinnas rhomb-ovate, gash-serrate, the lowest lobed, subbipinnate; stipe covered with scariose scales.—Native of New South Wales.

130. Polypodium Nudum. Fronds bipinnate; leaflets and pinnas rhombed, gashed, crenate; stipe rugged.—Native of New South Wales.

131. Polypodium Setosum. Fronds bipinnate; leaves subbipinnate; pinnas linear, gashed, serrate; serratures setaceous; stipe villose.—Native of New South Wales.

132. Polypodium Aristatum. Fronds bipinnate; lower leaflets pinnate; pinnas rhomb-oblong, gashed; segments mucronate, serrate; stipe somewhat villose.—Native of New South Wales.

133. Polypodium Adiantiforme. Fronds subbipinnate; leaflets ovate, gashed; lobes ovate, obtuse, crenate-serrate, the lowest separate; stipe scaleletted, rough.—Native of New South Wales.

134. Polypodium Medullare. Fronds bipinnate; leaflets pinnate, very long, pointed; pinnas oblong, subfalcate, acute, crenate; stipe rough; trunk arboreous, hispid.—This is frequent in the woods of New Zealand, where it is called *Mamuga.* The natives eat the pith of the root and lower part of the trunk roasted. It has a taste like that of the Turnip, but better, and approaches to the Sago.

135. Polypodium Extensum. Fronds bipinnate; leaflets pinnate, acuminate, serrate at the tip; pinnas oblong, serrate; stipe rough, with dots; stem arboreous.—Native of the islands in the South Sea.

136. Polypodium Dealbatum. Fronds bipinnate; leaflets pinnate, acuminate, white underneath; pinnas oblong, subfalcate, serrate; stipe rough; trunk arboreous.—Native of New Zealand.

137. Polypodium Affine. Fronds bipinnate; leaflets pinnate, acuminate, white underneath; pinnas acuminate, linear-oblong, crenate.—Native of the islands in the South Seas.

138. Polypodium Lunulatum. Fronds bipinnate; leaflets pinnate, serrate at the tip, setaceous; pinnas linear-oblong, falcate, serrulate at the tip; stipe rough.—Native of the islands in the South Seas.

139. Polypodium Latifolium. Fronds subbipinnate; leaflets ovate, acuminate, pinnatifid and lobed; segments repand crenate; stipe very smooth, shining.—Native of the islands in the South Seas.

Polypody. See *Polypodium.*

Polypremum; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth four-leaved, permanent; leaflets lanceolate, keeled, coloured within. *Corolla:* one-petalled, wheel-shaped; limb four-cleft; lobes obcordate, the length of the calix. *Stamina:* filamenta four, very short, in the throat of the corolla; antheræ roundish. *Pistil:* germen obcordate; style short, permanent; stigma truncate. *Pericarp:* capsule ovate, compressed at the tip, emarginate, two-celled, two-valved; the partitions contrary. *Seed:* numerous, fastened to an oblong ascending receptacle, connected with the partition below. Essential Character. *Calix:* four-leaved. *Corolla:* four-cleft, wheel-shaped, with obcordate lobes. *Capsule:* compressed, emarginate, two-celled.——The only known species is,

1. Polypremum Procumbens. Root annual; stems procumbent; leaves linear, subulate, in whorls; peduncles one-flowered, solitary, in the whorls of leaves; flowers small, white.—Native of Carolina and Virginia.

Polytrichum; a genus of the class Cryptogamia, order Musci.—Essential Character. *Outer fringe*, of thirty-two, or sixty-four, short, flat, incurved teeth; *inner*, a flat transverse, orbicular, undivided membrane. *Veil* generally double; the outer hairy.—There are sixteen British species, besides foreign. The following are most worthy of notice.

1. Polytrichum Commune; *Common Hair-moss.* Stem simple; leaves linear-lanceolate, finely serrated; capsule erect, quadrangular; pedestal roundish. It forms large tufts of simple plants, matted together by the copious fibres of their very long unbranched creeping roots.—Common on boggy or turfy groves or woods throughout Europe.

2. Polytrichum Alpinum; *Alpine Hair-moss.* Leaves lanceolate-awl-shaped, finely serrated; capsule ovate, drooping; pedestal turbinate; stem branched.—Native of Alpine tracts in Wales, Scotland, Switzerland, &c.

Pomegranate. See *Punica.*

Pometia; a genus of the class Monœcia, order Hexandria.—Generic Character. *Male Flowers. Calix:* perianth one-leafed, wheel-shaped, six-cleft, very short; segments roundish. *Corolla:* petals six, orbicular, erect, a little longer than the calix; nectary a raised rim, with six little swellings. *Stamina:* filamenta six, awl-shaped, erect, three times as long as the corolla, placed on the margin of the nectary; antheræ parabolical, bifid at the base. *Pistil:* rudiment in the centre of the flowers. *Female Flowers*, in the same raceme with the males. *Calix* and *Corolla:* as in the males. *Pistil:* germen obcordate, twin, two-celled; style filiform, four times as long as the corolla; stigma compressed. *Pericarp:* berry globular, fleshy, superior. *Seeds:* single, ovate, in the centre of the berry. Essential Character. *Calix:* one-leafed, six-cleft. *Petals:* six. *Male. Stamina:* six. *Female. Berry:* globular, with one seed in the centre.—— The species are,

1. Pometia Pinnata. Leaves pinnate; raceme superdecompound, terminating.—Native of the South Sea islands.

2. Pometia Ternata. Leaves ternate; racemes almost simple, axillary. The parts of fructification are not six as in the preceding, but two, and multiples of that number.—Native of New Caledonia.

Pommereulla; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* glume turbinate, three or four flowered, two-valved; valves equal, wedge-shaped, divaricate at the base; claw incurved, linear, gradually widening, four-cleft; segment dilated in a ring, and involving the florets, unequal; the side ones larger, lanceolate, acute; the inner or middle ones shorter by half, awl-shaped, awned; awn dorsal, inserted between the inner segments, solitary, straight, upright, larger than the valves. *Corolla:* glume two-valved; valves unequal; the outer very like the calicine glumes, awned; the inner very short, quite simple or undivided, ovate, flat, awnless. *Stamina:* filamenta three, very short; antheræ linear, the length of the glumes. *Pistil:* germen linear; style simple; stigmas two, villose at the side. *Pericarp:* none; corolla unchanged, contains the seed till it is ripe, then gapes and lets it drop. *Seed:* single, oblong, flat on the inner side, on the outer convex, pellucid, very smooth. *Observe.* The flower resembles the figure of the *Dianthus*, with a narrow tube, and a spreading subradiate border; for the florets in the centre of the flower converge to a point. Essential Character. *Calix:* turbinate, two-valved, three or four flowered; valves four-cleft, awned at the back. *Corolla:* two-valved, awned. ——The only species yet known is,

1. Pommereulla Cornucopiæ. Root creeping, fibrous, white; leaves equitant, imbricate, in two rows, compressed, scarcely a finger's length, even; culms branched, scarcely longer than the leaves. It is a small and very singular Grass, a few inches high. The flowers are spiked, each resembling a little shuttlecock.—Native of the East Indies.

Pompion. See *Cucurbita.*

Pomum. See *Pyrus.*

Ponæa; a genus of the class Octandria, order Trigynia.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments roundish, concave, spreading. *Corolla:* four, lanceolate, acute, with a few hairy glands at the tip, longer than the calix, fastened to the annular receptacle of the flower. *Stamina:* filamenta eight, capillary, inserted into the same receptacle, alternate (opposite to the petals larger, opposite to the corolla smaller,) the length of the corolla; antheræ ovate. *Pistil:* germen oblong, triangular, somewhat stalked; styles three, short; stigmas acute. *Pericarp:* capsule three-celled, three-winged, each wing two-valved. *Seeds:* solitary, ovate. Essential Character. *Calix:* five-parted, spreading. *Petals:* four, with hairy glands at the tip. *Germen:* three-sided. *Capsule:* three-winged, three-celled, with one seed in each cell.—— The only species known is,

1. Ponæa Guianensis. This is a tree, with a middle-sized trunk of twenty feet high, and branched at the top into three dimensions, each of which is garnished throughout its whole length with leaves growing pretty near each other. Leaves winged, of many pairs of unequal-sided, entire, veiny, smooth leaflets, seven or eight inches in length. The flowers, which are very small, and of a whitish colour, are produced at the extremities of the branches on large spreading panicles; they are sessile, and placed on the panicle in little approximating heaps.—This tree is a native of Guiana, growing near the borders of rivers; fruiting and flowering in November.

Pondweed. See *Potamogeton.*

Pontederia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* spathe common, oblong, opening on the side. *Corolla:* one-petalled, two-parted, tubular; upper lip straight, three-parted, outwardly

unequal; lower lip reflex, three-parted; segments equal. *Stamina:* filamenta six, inserted into the corolla, three of them awl-shaped, longer, inserted into the mouth of the tube, the three others into the base of it; antheræ erect, oblong. *Pistil:* germen oblong, superior; style simple, declined; stigma thickish. *Pericarp:* capsule fleshy, conical, with the tip wide and bent in, three-celled, triangular, three-grooved. *Seeds:* roundish, very many. ESSENTIAL CHARACTER. *Corolla:* one-petalled, six-cleft, two-lipped. *Stamina:* three inserted into the top, three into the tube of the corolla. *Capsule:* three-celled.——The species are,

1. Pontederia Ovata; *Ovate-leaved Pontederia.* Leaves ovate; flowers in heads. Swartz says, that this plant belongs to the class *Monandria,* and is very nearly allied to *Thalia,* if it be not a species of that genus.—Native of shady moist places in Malabar and Cochin-china.

2. Pontederia Rotundifolia; *Round-leaved Pontederia.* Leaves orbicular, cordate.—Native of Surinam.

3. Pontederia Azurea; *Blue-flowered Pontederia.* Leaves roundish, elliptic, thickened at the base and petioles; flowers in spikes. This is a stemless aquatic plant; root jointed, with long capillary whitish fibres at the joints.—Native of Jamaica, in most of the lagoons and rivers.

4. Pontederia Vaginalis. Leaves cordate; raceme drooping.—Native of the East Indies.

5. Pontederia Limosa; *Blue and Yellow Pontederia.* Leaves cordate-ovate; scapes lateral, one-flowered; flowers triandrous.—Native of Jamaica and Hispaniola, on the banks of rivers.

6. Pontederia Cordata; *Heart-leaved Pontederia.* Leaves cordate; flowers in spikes. The stem rises a foot or two above the water; leaves smooth, on long, spungy, sheathing stalks; flowers numerous, of a brilliant full sky-blue.—Native of marshy places in Virginia, and most parts of North America. As this plant grows naturally in moist boggy places, it is very difficult to be preserved in England; nor does the plant arise from seeds, which have been sown in various situations and differently treated, but never appeared. Three or four plants that were sent to Mr. Miller from New England, were by him planted in pots, covered with moss, and constantly supplied with water. With this management two of them flowered, but, as they were not put under shelter, the following winter destroyed them; so that they probably might be preserved under a hot-bed frame in winter, and safely exposed to the open air in mild weather.

7. Pontederia Hastata; *Hastate-leaved Pontederia.* Leaves hastate; flowers umbelled.—Found near Madras, and in Cochin-china. This species is more difficult to preserve in England than the preceding, being a native of hot countries, and always grows in watery places.

Poplar Tree. See *Populus.*

Poppy. See *Papaver.*

Poppy, Horned. See *Chelidonium.*

Poppy, Prickly. See *Argemone.*

Poppy, Spatling. See *Cucubalus.*

Populus; a genus of the class Dicœcia, order Polyandria. —GENERIC CHARACTER. *Male. Calix:* ament oblong, loosely imbricate, cylindrical, composed of one-flowered, oblong, flat scales, torn at the edge. *Corolla:* petals none. *Nectary:* one-leafed, turbinate, below tubular, ending at top obliquely in an ovate border. *Stamina:* filamenta eight, extremely short; antheræ four-cornered, large. *Female,* on a separate plant. *Calix* and *Corolla:* as in the male. *Pistil:* germen ovate, acuminate; style scarcely manifest; stigma four-cleft. *Pericarp:* capsule ovate, two-celled, two-valved; valves reflex. *Seeds:* numerous, ovate, flying with a capillary pappus. ESSENTIAL CHARACTER. *Male. Calix:* of the ament a flat scale, torn at the edge. *Nectary:* turbinate, oblique, entire. *Female. Stigma:* four-cleft. *Capsule:* two-celled, two-valved. *Seeds:* many, pappose.——The species are,

1. Populus Alba; *White Poplar.* Leaves sublobed, toothed, tomentose, and snow-white underneath; lobes acute, patulous; female catkins ovate; stigmas four. This tree grows very tall, with a straight trunk, covered with a smooth whitish bark. The Common White Poplar, and Great White Poplar, or Abele, are varieties of this species. The Abele, as Mortimer justly remarks, is a sort of White Poplar, only much finer, bears a larger leaf, and makes a much stronger shoot, being a much quicker grower. He adds, that the best sort comes from Holland and Flanders, from which it is sometimes called Dutch Beech. The Dutch look upon a plantation of these trees as an ample portion for a daughter; which may be well allowed, if the calculation of Sir Richard Weston hold good. He began to plant them some years ago about Richmond; and calculated that thirty pounds being laid out on these plants, would render at the least ten thousand pounds in eighteen years, every tree affording thirty plants, each of which would yield thirty plants more, after each seven years improving twelve-pence in growth, till they arrive at their *acmé.* Evelyn remarks, that the wood of the White Poplar is sought for amongst sculptors; and that both it and the Black Poplar are sawn into boards, which last a long time in dry places. Anciently, shields were made of this wood; which has since served for wheelbarrows, and the sides of waggons and carts, being considered as a useful substitute for Ash. The Abele Tree is of a quick growth, and bears cropping. The wood is soft, white, and stringy, and makes good wainscoting, being little subject to swell or shrink; it is used in floors, laths, packing-cases, and turners' ware. In floors it will last many years, and for its exceeding whiteness is often preferred to the Oak; but being soft, it is liable to take the impression of nails, which is the principal objection. For turnery ware it excels all other woods in its whiteness, so that trays, bowls, and many domestic utensils, are made of it. The bellows-makers prefer it, as also do the shoemakers, not only for the heels but the soles of shoes. The poles are very proper to support Vines, Hops, &c. and the lopping will supply good fuel, which is often very scarce.—This species is a native of Europe, in woods and hedges, and near rivers and brooks; flowering in March, and the leaves are fully expanded in May or June. It is found from Sweden to Italy, and also in Siberia and Barbary. This, and all the trees of this genus, may be propagated either by layers or cuttings, which will readily take root: also from suckers, which the White Poplars send up in great plenty from their roots; but they are less valuable when increased by suckers, being liable to send up too many suckers themselves. The best time for transplanting the suckers is in October, when their leaves begin to decay. These may be placed in a nursery for two or three years, to get strength before they are planted out where they are designed to remain; but if you intend to propagate them from large truncheons, it is better to defer the doing of that until February, when you may plant them from two to six feet long, thrusting them about a foot and a half into the ground. These will readily take root; and if the soil be moist in which they are planted, they will arrive to a considerable bulk in a few years. Spring is the best season for planting the cuttings; though they will grow if planted in any of the winter months. They should all be vigorous shoots of the last year, or at least not older than two years,

a foot and half in length. Plant them ten inches or a foot in the ground, in rows two feet and a half or a yard asunder, and a foot or eighteen inches from each other. Look over the plants in summer, to nip off all side-shoots. In two years they may be planted out, if they are for small woods or spinneys, in boggy or watery grounds. If they are for standards, they may remain in the nursery another year; and when planted out will be worth, in twenty or thirty years, as many shillings each. To form a coppice of these trees, if the land be not so boggy but that it may be ploughed, a crop of oats or other grain may be got off it the year preceding the planting, and in the autumn it should be ploughed again. Let two-year old plants from the nursery be planted one yard asunder. Hoe down the weeds the first year, afterwards they will require no further trouble till the time of cutting, which may be in seven years; and every four or five years after they may be cut for poles, fire-wood, &c. By these means boggy and marshy land will often produce more than the best pasture. If the ground will not admit of ploughing and sowing, the plants must be set in holes at the same distance. For timber-trees they may also be planted a yard asunder, and when the heads begin to interfere, every other tree may be taken away, or the weakest and least thriving removed; thus continuing to thin them as often as necessary. After they are finally planted out, never strip them up, nor take off any side-branches.

2. Populus Tremula; *Aspen*, or *Trembling Poplar Tree*. Leaves roundish, tooth-angular, smooth on both sides; footstalks compressed; young branches hairy; stigmas four, auricled at the base.—This tree causes a great litter in the spring, when their catkins and down fall off; and their roots being very apt to produce a large quantity of suckers, especially those trees which came from suckers, they are unfit to be planted near a house or garden; but when interspersed with other trees in large plantations, they afford an agreeable variety, the leaves being very white on their under sides, which, when blown with the wind, are turned to sight. This tree derives its name from the German *Espe*, which is their generic name for Poplars. The trembling of the leaves is proverbial; and the Scotch Highlanders account for it by saying, that our blessed Lord's cross was made of this tree, and therefore the leaves can never rest. This tree is of speedy growth, and will thrive in any situation or soil, but worst in clay. It impoverishes the land: its leaves destroy the grass; and the numerous shoots of the roots spread so near the surface, that they will not permit any thing else to grow. The wood is extremely light, white, smooth, soft, and durable in the air. Pannels or packsaddles, milk-pails, clogs, pattens, &c. are made of the wood. The leaves and leaf-stalks are sometimes set with red glandular substances, about the size of a pea, which contain an insect called *Tipula Juniperma*.—Native of Europe, from Sweden to Italy, in moist woods and in boggy ground; flowering in March.—A considerable advantage may be obtained by planting this, and indeed all the trees of this genus, upon moist boggy soils, where few others would thrive. Many such places there are in England, which do not at present bring much money to their owners, yet if planted with these trees, would in a very few years overpurchase the ground clear of all expense: but there are many persons who think nothing except corn worth cultivating, or if they plant timber, will have it Oak, Ash, or Elm; and should their land not be proper for any of these, it is deemed of little or no value: whereas if the nature of the soil were ascertained, and proper sorts of plants adapted to it, there might be a very great advantage made of many large tracts of land which now lie wholly neglected.

3. Populus Nigra; *Black Poplar Tree*. Leaves smooth on both sides, acuminate, serrate, deltoid, the longitudinal diameter longer; catkins cylindrical, lax; stigmas four. The trunk is naked and lofty, covered with an ash-coloured bark. It is a quick-growing tree, and on the banks of rivers, and in moist situations, throwing out numberless suckers from the roots. It loves a moist black soil, and bears cropping well. The bark being light like cork, serves to support the nets of fishermen. The wood is not apt to splinter; it is light and soft, and sometimes used by turners: it will make useful rafters, poles, and rails, and in a suitable soil brings in a quick return. It is so excellent for flooring boards, that it is much used for the purposes of deal in some of the midland counties. This wood is so slow in taking fire, that the flames in a building on fire are said to have been stopped where this timber had been used. Hence it is bad wood for fuel; but, like all other Poplar wood, very suitable for packing-cases. In Italy this tree is trimmed for the vines to run on. They poll or head the trees every second year, sparing the middle straight and most thriving shoot, and at the third year cut that off also. The shade of this tree is very wholesome in summer; but it does not become walks and avenues, by reason of the suckers, and because it fouls the ground at the fall of the leaf. It should be planted in woods, and to flank places at distance, by its increasing thickness, as well as for the glittering brightness of the foliage. The young leaves are an excellent ingredient in poultices for hard and painful swellings. The buds of both this and the White Poplar smell very pleasantly in the spring, and, being pressed between the fingers, yield a balsamic resinous substance, which, extracted by spirits of wine, smells like storax. A drachm of this tincture in broth, is administered in internal ulcers and excoriations, and is said to have removed obstinate fluxes proceeding from an excoriation of the intestines.—It is a native of Europe, from Sweden to Italy, near rivers, and in moist woods; flowering in March.—In the celebrated district of Waes in Flanders, the whole of which is distributed into small inclosures not more than an acre and half in extent, great quantities of White and Black Poplars are planted in the hedge-rows, sixteen or eighteen feet asunder: they are not suffered to grow to any great size, but are cut down every twenty or four-and-twenty years, and replaced by young plants of the same sort; the largest trees are always cut down, to prevent the land from being too much shaded. Fifty trees are allowed to an acre, and they are generally sold for seven or eight florins apiece, for making wooden shoes, of which they not only send a prodigious quantity into other provinces, but also supply all Holland with them.—This species is not so apt to take root from large truncheons; therefore it is the better method to plant cuttings about a foot and half in length, thrusting them a foot deep into the ground. These cuttings will take root very freely, and may be afterward transplanted where they are to remain. This sort will grow upon almost any soil, but will thrive best in moist places.

4. Populus Dilatata; *Lombardy*, or *Po*, *Poplar Tree*. Leaves smooth on both sides, acuminate, serrate, deltoid, the transverse diameter longer. This differs from the preceding chiefly in its close conical manner of growth. One beauty it possesses is almost peculiar to it, which is, the waving line it forms, when agitated by the wind: in most trees one side is at rest while the other is in motion, but this waves in one simple sweep from the top to the bottom, like an ostrich feather on the head of a coquette. All the branches coincide in the motion; and the least blast makes an impression on it, when other trees are at rest. Its pecu-

liar use in this country has hitherto been for mixing with other trees in ornamental plantations, and concealing unsightly buildings. To this last purpose its upright, close, conical mode of growing, with its feathering down to the ground, proves it to be well adapted. Its timber, though highly prized in Italy, is inferior to that of the Black Poplar.

5. Populus Canescens; *Common White*, or *Grey Poplar*. Leaves roundish, deeply waved, toothed, grey and downy beneath; female catkins cylindrical; stigmas eight. This is a taller and handsomer tree than the first species, with a beautiful sattiny bark.—Native of wet ground in England, France, and Germany.

6. Populus Balsamifera; *Common Tacamahaca Poplar Tree*. Leaves ovate, serrate, whitish underneath; stipules resinous. The buds of this tree, from autumn to the leafing season, are covered with abundance of a glutinous yellow balsam, which often collects into drops, and is pressed from the tree as a medicine. It dissolves in spirits of wine; and the inhabitants of Siberia prepare a medicated wine from the buds. This wine is a diuretic, and, as they think, serviceable in the scurvy. The grouse, and other birds which there feed upon these buds, acquire a flavour which is much esteemed. By the growth of this tree in Europe, it seems not to be of a large size.—It is a native of Canada, and some other parts of North America, whence the balsam is brought over to Europe in shells. It is smooth, of an even texture, and in colour like stained Galbanum, but lighter. This tree sends up a great number of suckers from the roots, by which it multiplies in plenty; and every cutting which is planted will take root, so that when a plant is once obtained, plenty may be raised. Plant the cuttings in the middle of February, in rich mellow earth, shaded from the mid-day sun, and watered in dry weather. The succeeding February remove them, smooth the extremities of their roots, cut off the strong side-branches, and plant them in rows three feet distant, and eighteen inches asunder in the rows; here let them continue two or three years, when they may be transplanted to the places where they are intended to remain. It will grow on almost any soil; and when there are void places in plantations, occasioned by the death of other trees, this will sooner and better supply their places than most others.

7. Populus Candicans; *Heart-leaved Tacamahaca Poplar Tree*. Leaves cordate, acuminate, whitish underneath.—Native of Canada.

8. Populus Lævigata; *Smooth Poplar Tree*. Leaves cordate, three-nerved, smooth, glandular at the base, unequally serrate; petioles compressed; branches round. It flowers in March and April.—Native of America.

9. Populus Monilifera; *Canadian Poplar Tree*. Leaves subcordate, smooth, glandular at the base; serratures cartilaginous, hooked, somewhat hairy; nerves patulous; petioles compressed; branches round.—It flowers in May; and is a native of Canada.

10. Populus Græca; *Athenian Poplar Tree*. Leaves cordate, smooth, glandular at the base, remotely crenate; petioles compressed; branches round. This resembles the tenth species in growth and foliage. It flowers in March and April.—Native of the islands of the Archipelago.

11. Populus Heterophylla; *Various-leaved Poplar Tree*. Leaves cordate, the primary ones pubescent, and without any glands at the base; petioles roundish; branches round. This is a large tree; branches numerous, veined, and angular; leaves broad and slightly serrate; flowers in loose aments, making little show. It flowers in April and May.—Native of Virginia and New York.

12. Populus Angulata; *Carolina Poplar Tree*. Leaves cordate, smooth; branches angular, winged; shoots very strong, and generally cornered, covered with a light green bark, like some sorts of Willow. It grows naturally in Carolina, where it becomes a very large tree.—It may be propagated by cuttings or layers; the latter is generally practised by the nursery gardeners, being the surest method, and those plants are not so full of moisture as those raised by cuttings, so are less liable to be cut down by the frost when young, as they are very apt to be a considerable length. They should be planted in a sheltered situation; for their leaves being very large, the wind has great power over them; and the branches being tender, are frequently broken or split down when they are much exposed.

Porana; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved; leaflets lanceolate, blunt, commonly shorter than the corolla, spreading, permanent; when in fruit larger. *Corolla:* one-petalled, bell-shaped, half five-cleft, erect, acute. *Stamina:* filamenta five, capillary, spreading, commonly shorter than the corolla; antheræ incumbent, oval. *Pistil:* germen superior, subglobular; style semibifid, longer than the corolla, bristle-shaped, permanent; stigmas capitate. *Pericarp:* two-valved. *Seed:* not ascertained. Essential Character. *Calix:* five-cleft; when in fruit larger. *Corolla:* bell-shaped. *Style:* semibifid, longer, permanent. *Stigmas:* globular. *Pericarp:* two-valved.——The only known species is,

1. Porana Volubilis. It is a smooth twining shrub, with alternate heart-shaped leaves. Flowers small, in a large spreading panicle.—Native of the East Indies.

Porostema; a genus of the class Polyadelphia, order Poliandria.—Generic Character. *Calix:* perianth one-leafed, coloured, permanent, six-parted; segments ovate, obtuse, the three inner less. *Corolla:* petals none; nectary of nine scales, oblong, truncate; six outer inserted at bottom into the segments of the calix, and incumbent on them; three inner fastened to the receptacle opposite to the former; each having four pores, the outer ones on the inner side, the inner ones on the outer side; glands six, roundish, fleshy, growing to the bottom of the calix, between the inner and outer scales of the nectary. *Stamina:* filamenta thirty-six, fastened to the scales of the nectary, each proceeding from each pore; antheræ roundish, compressed, peltate. *Pistil:* germen ovate, angular, immersed in the receptacle; style short; stigma obtuse, concave. *Pericarp:* drupe turbinate, fastened to the calix; (capsule, according to Aublet, roundish, four or six celled, covered with the calix.) *Seeds:* two, according to Rolander; (Aublet says, very many, extremely small.) Essential Character. *Calix:* six-parted, unequal. *Petals:* none. *Nectary:* nine scales, with four antheræ on each. *Capsule:* covered, four or six celled, many-seeded. ——The only known species is,

1. Porostema Guianensis. This tree rises thirty feet high, branching at top; the branches are cornered, straight, and horizontal: flowers whitish, small, paniculated, terminal, and axillary, and exhale a very pleasant odour. It flowers in Guiana in April.

Portlandia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, superior; leaflets oblong, lanceolate, permanent. *Corolla:* one-petalled; tube long, funnel-form, ventricose; border shorter than the tube, five-parted, acute. *Stamina:* filamenta five, awl-shaped, declined, almost the length of the corolla, from the bottom of the tube; antheræ linear, erect, the length of the corolla. *Pistil:* germen five-cornered, roundish, inferior; style simple, the length of the stamina; stigma oblong, obtuse. *Pericarp:* capsule obovate, five-streaked,

five-cornered, retuse, two-celled, two-valved, opening at the top; partition contrary. *Seeds:* very many, roundish, compressed, imbricate. *Observe.* The first and fourth species have four and six stamina. Essential Character. *Corolla:* club-funnel-shaped. *Antheræ:* longitudinal. *Capsule:* five-cornered, obtuse, two-celled, two-valved, many-seeded, crowned with the permanent calix.——The species are,

1. Portlandia Tetrandra; *South-Sea Portlandia.* Flowers tetrandrous; leaves oblong, blunt, (obovate, according to Forster;) stipules wide, dilated with a point. Stem shrubby, with rugged branches; flowers axillary, solitary, stalked; corolla white.—Native of Savage Island, in the South Seas.

2. Portlandia Coccinea; *Scarlet Portlandia.* Flowers pentandrous; leaves ovate, coriaceous. This is a shrub, two or three feet high, erect, branched. Flowers deep scarlet. —Native of Jamaica, in the western parts, on mountainous precipices, where, however, it is not common, but flowers in June and July.

3. Portlandia Grandiflora; *Large-flowered Portlandia.* Flowers pentandrous. Swartz says, leaves lanceolate, elliptic; Smith, calicine leaflets ovate. Stem shrubby, but weak, and trailing; leaves opposite, elliptical, pointed, a span long, of a fine dark shining green; flowers white, rather longer than the leaves. The flowers exhale a very grateful and refreshing odour in the evening. Dr. Browne gathered it plentifully among the rocks at the foot of mountains in Jamaica.—It may be propagated either by seeds or cuttings. The seeds, when they can be obtained, may be sown in pots of light earth in the spring, and plunged in the tan-pit: the cuttings do not strike very easily. They must be managed in the same way as other woody plants from Jamaica, and require a stove-heat.

4. Portlandia Hexandra; *Laurel-leaved Portlandia.* Flowers hexandrous; tube subincurved; peduncles ternate; leaves ovate; calicine leaflets lanceolate. This is a shrub, six feet in height: the flowers are handsome, sweet, numerous, nearly three inches in length; the petals flesh-coloured on the outside, white within, marked with lines. The seeds are generally eaten by insects. It flowers in August and September. —Native of woods and coppices about Carthagena, Guiana, and Cayenne.

Portulacaria; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth two-leaved, coloured, permanent; leaflets roundish, concave, obtuse, spreading very much, opposite. *Corolla:* petals five, obovate, obtuse, quite entire, concave at top, flat at the base, with the sides mutually incumbent, spreading very much, almost three times as long as the calix, permanent. *Stamina:* filamenta five, awl-shaped, very short, erect, two on each side of the germen, the other solitary; antheræ erect, ovate. *Pistil:* germen three-cornered, superior, the length of the petals; style none; stigmas three, spreading very much, ascending at the tip, muricated above. *Pericarp:* none. The calix and corolla, now erect, closely embrace the base of the seed. *Seed:* single, ovate-oblong, obtuse, winged, three-sided. Essential Character. *Calix:* two-leaved. *Petals:* five. *Seed:* one, three-sided, and winged.——The only known species is,

1. Portulacaria Afra; *Purslane Tree.* This plant rises with a strong thick succulent stalk, to the height of three feet, sending out branches on every side, so as to form a kind of pyramid.—It is very easily propagated by cuttings, planted during any of the summer months, and having been laid to dry for some days before, in pots filled with sandy earth. It must be placed in a warm glass-case in winter, where it may enjoy the full sun, and should have very little water during that season. In summer the plants should be placed abroad in a sheltered situation, and, in warm weather, should be refreshed with water twice a week; but the stalks being very succulent, too much wet always injures these plants.

Portulacca; a genus of the class Dodecandria, order Monogynia.—Generic Character. *Calix:* perianth bifid, small, compressed at the tip, permanent, (Gærtner says, two-leaved, superior, caducous.) *Corolla:* petals five, flat, erect, blunt, larger than the calix. *Stamina:* filamenta many, sometimes twenty, capillary, shorter by half than the corolla; anthera simple. *Pistil:* germen roundish, (half inferior, according to Gærtner;) style simple, short; stigmas five, oblong, the length of the style. *Pericarp:* capsule covered, ovate, one-celled, (cut transversely, according to Gærtner.) *Receptacle:* free. *Seeds:* numerous, small. *Observe.* The first four species have a circumcised capsule; in the fifth, seventh, eighth, and twelfth, the capsule is three-valved: the last also has a five-leaved calix. The third species has a four-parted corolla, eight stamina, and an inferior germen. Essential Character. *Calix:* bifid or two-leaved. *Corolla:* five-petalled. *Capsule:* one-celled, cut round, or three-valved. *Receptacles:* according to Gærtner, five, free, distant.——The species are,

1. Portulacca Oleracea; *Garden Purslane.* Leaves wedge-shaped; flowers sessile. This is an annual and herbaceous plant, with a round, smooth, procumbent, succulent stem; leaves clustered, stalked, above an inch long; flowers clustered, terminal, small, yellow, opening but for a short time towards noon. It differs from the wild sort only in having larger and more succulent leaves. If the garden kind be permitted to scatter the seeds, in two years it will become in every respect like the wild plant. There are two other varieties; one with deep green leaves; and the other with yellow leaves, which is called Golden Purslane; but they are only seminal variations.—Native of both Indies, China, Cochinchina, Japan, and the Island of Ascension, and of many parts of Europe. It is a pleasant salad herb, and so wholesome that it is a pity it is not more used for that purpose, especially as it is excellent for those who are troubled with scorbutic disorders; and the expressed juice, taken while fresh, is good for the strangury and stoppage of urine.—Sow the seeds upon a bed of rich light earth during any of the summer months; but to have it early in the season, it should be sown upon a hot-bed. This seed being very small, little of it will be sufficient for a family. Keep the plants clear from weeds, and in dry weather water them two or three times a week; in warm weather they will be fit for use in six weeks. To continue a succession, sow three or four times, at the interval of a fortnight or three weeks. If the seeds are intended to be saved, leave some of the earliest plants for this purpose, drawing out all such as are weak, or have small leaves. When the seeds are ripe, cut up the plants, and spread them upon cloths to dry; then beat out the seeds and sift them, to clear them from the leaves and seed-vessels.

2. Portulacca Pilosa; *Hairy Purslane.* Leaves awl-shaped, alternate; axils hairy; flowers sessile, terminating. This is an annual herbaceous plant, with very succulent stalks, of a purple colour, and branching out greatly.—Native of the West Indies. Browne says, it is cultivated in many of the gardens in Jamaica, where it has been introduced on account of its constant greenness, and the frequent shooting of its flowers. It is found on the Quays, or smaller sandy islands beyond Port Royal; and grows in spreading tufts or beds about the root. All parts of the plant are very bitter, and frequently used by the poorer people as a stomachic. This, and the following species, being too tender to live in the open air, must be kept in pots, and placed in the dry-stove or

tan-pit, according to the country whence they come. The herbaceous sorts are propagated by seeds, and the shrubby ones by cuttings. Browne says, that the second species roots from the joints, and is very easily propagated in Jamaica, but thrives best in a warm rich soil.

3. Portulacca Quadrifida; *Creeping Annual Purslane.* Bractes in fours; flowers quadrifid; stem with hairy joints. A small trailing annual, with yellow flowers.—Native of Egypt and the East Indies.

4. Portulacca Halimoides; *Downy-headed Purslane.* Leaves oblong, fleshy; stem corymbose; flowers sessile. This grows in beds, and spreads a little upon the ground.—Annual; and a native of Jamaica.

5. Portulacca Triangularis; *Triangular-racemed Purslane.* Leaves obovate, flattish; raceme simple, three-sided. This is a shrubby plant, two feet high; flowers pretty, but scentless.—Native of the West Indies, on rocks.

6. Portulacca Crassifolia; *Thick-leaved Purslane.* Leaves lanceolate, flat; racemes three-sided; stem erect. The whole plant is very smooth.

7. Portulacca Anacampseros; *Round-leaved Purslane.* Leaves ovate, gibbous; peduncle many-flowered; stem shrubby. At the top of the stalk comes forth a slender peduncle, about two inches long, supporting four or five red flowers, appearing in July, but not succeeded by seeds in England.—Native of the Cape. This may be propagated in the same way as the most succulent sort of Aloes.

8. Portulacca Patens; *Panicled Purslane.* Leaves lanceolate, ovate, flat; panicle branched; calices two-leaved; stems round, woody at bottom, smooth, brittle, suberect.—Native of the West Indies.

9. Portulacca Cuneifolia; *Wedge-leaved Purslane.* Leaves wedge-shaped, flat; lower peduncle of the raceme three-flowered; calices two-leaved.—This is allied to the preceding, and is a native of Egypt.

10. Portulacca Meridiana. Leaves elliptic, fleshy, flat; stem creeping, jointed, hairy; flowers sessile, terminating. A small, bushy, creeping herb, with yellow flowers encompassed with wool.—Native of the East Indies, flowering from twelve at noon through the day.

11. Portulacca Decumbens; *Prostrate Purslane.* Leaves obovate, mucronate; calices five-leaved; stem shrubby, decumbent.—Native of Egypt.

12. Portulacca Fruticosa; *Shrubby Purslane.* Leaves obovate, flattish; peduncles racemed; calices five-leaved; stem shrubby.—Native of Jamaica; where, Browne says, it is a beautiful plant, and grows in a gravelly soil, in the road through Cambridge Hill.

Potamogeton; a genus of the class Tetrandria, order Tetragynia.—Generic Character. *Calix:* none. *Corolla:* petals four, roundish, obtuse, concave, erect, clawed, deciduous. *Stamina:* filamenta four, (or, as Gærtner says, eight,) flat, obtuse, very short; antheræ twin, short. *Pistil:* germina four, ovate-lanceolate; style short, (or, according to Gærtner, simple, very short, recurved;) stigmas obtuse. *Pericarp:* none; (Gærtner says, four, one-celled.) *Seeds:* four, roundish, acuminate, gibbous on one side, compressed on the other, and angular. Essential Character. *Calix:* none. *Petals:* four. *Style:* none, or very short. *Seeds:* four, (Gærtner says, *Drupes* four.)——The species are,

1. Potamogeton Natans; *Broad-leaved Pondweed.* Upper leaves oblong-ovate, petioled, floating: Withering says, elliptic, acute, rounded, and subcordate at the base. The root consists of long simple fibres, running deep into the mud; the stem many feet in length, much branched, round, leafy; the upper leaves are dark green, three inches long, and one and a half broad. The floating leaves afford an agreeable shade to fish, and are the habitation and food of a moth named Phalæna Potamogetonis. The swan also is very partial to the roots of this aquatic plant. Linneus observes, that when it grows in water which is dried up in summer, it surprisingly changes its appearance, growing upright, and resembling a small Plantago.—Native of Europe, in slow rivers, lakes, ponds, and ditches; flowering in July and August. Found also in New South Wales. Pursh discovered a plant very much like this in North America, but he was not able to ascertain whether it was a variety or a distinct species.

2. Potamogeton Fluitans; *Long-leaved Floating Pondweed.* Leaves lanceolate-ovate, drawn to a point at both ends, on long petioles, floating. This resembles the preceding, and perhaps is only a variety, arising from places about Berlin; though it is constantly distinct.—Found in the rivers of Europe.

3. Potamogeton Heterophyllum; *Various-leaved Pondweed.* Upper leaves elliptic, drawn to a point at both ends, petioled; lower ones clustered, sessile, linear.—Native of Germany and Britain, in ditches and still pools.

4. Potamogeton Perfoliatum; *Perfoliate Pondweed.* Leaves cordate, embracing, all immersed. Stems very long, round, alternately branched, with leaves crowded about the top and branches. Every part of the plant, except the flower-stalks, is under water, so that it is only discovered by the spikes standing a little above the surface, in July and August, and abounding in whitish pollen. It would seem that the respiration of such truly aquatic vegetables, must be as different from the respiration of those which inhale atmospheric air, as the breathing of fishes is from that of beasts and birds.—Native of Europe, Siberia, and Barbary, in ditches, ponds, lakes, and slow rivers; also of Port Jackson.

5. Potamogeton Densum; *Close-leaved Pondweed.* Leaves ovate, acuminate, opposite, clustered; stem dichotomous; spike four-flowered. This propagates itself by runners, which throw out fibrous roots here and there into the mud, and send up round stems, naked and simple below, dichotomous above.—It flowers in the early part of summer, in ditches, ponds, and slow streams, in Britain, Denmark, Flanders, France, Germany, Switzerland, Italy, Siberia, and Barbary.

6. Potamogeton Lucens; *Shining Pondweed.* Leaves ovate-lanceolate, flat, attenuated into the petioles; spike many-flowered, squeezed close. There are two common varieties of this species; which is frequent in ditches, ponds, lakes, and slow-flowing rivers, chiefly on a clay soil; growing, like most others of the genus, all immersed in the water, except the spike of pale olive flowers, which appears above the surface about midsummer, or a little after.

7. Potamogeton Crispum; *Curled Pondweed.* Leaves lanceolate, alternate, waved, serrate. Ducks very readily eat not only the seeds, but the leaves of this plant: hence the introduction of water-fowl probably would prevent its increasing too much.—Native of Europe, Siberia, and New Holland, in ponds and slow rivers; flowering in June and July.

8. Potamogeton Serratum; *Serrated Pondweed.* Leaves Leaves lanceolate, opposite, somewhat waved. In the lakes of Switzerland this plant grows from the amazing length of ten to twenty fathoms, forming whole woods as it were, in the midst of the waters. It is distinguished from the preceding species chiefly, in having the leaves more in clusters, and quite entire.—Native of Europe.

9. Potamogeton Compressum; *Flat-stalked Pondweed.* Leaves linear, obtuse; stem compressed. Withering remarks, that the leaves are narrower than the seventh species, and

not waved; the spikes shorter than the peduncles, and the flowers greenish.—Native of Europe, in ditches and slow streams; flowering in June and July, when its small spikes of about four brownish-green flowers, emerge from the water.

10. Potamogeton Grammeum; *Grassy Pondweed.* Leaves linear-lanceolate, alternate, sessile, wider than the stipules; stem round, subdichotomous. It flowers in July.—Native of Europe, in ditches and slow streams. Found in England near Deptford; on Binsey common; in ditches by the road-side going to Port Meadow, Oxford; on the river Skern, near Darlington. Found also at Port Jackson.

11. Potamogeton Pusillum; *Small Pondweed.* Leaves linear, opposite, and alternate, narrower than the stipules, spreading at the base; stem round; peduncles axillary.—The whole plant is extremely slender, and much branched. It flowers in July; appears to be perennial; and is found all over Europe, in ditches and ponds in a clayey soil.

12. Potamogeton Pectinatum; *Fennel-leaved Pondweed.* Leaves bristle-shaped, parallel, approximating, distich, sheathing at the base. Root originating from a tuberous lump, then creeping horizontally, slender, much branched, as also is the stem, which floats under water, extending two or three feet.—Native of Europe, in ponds, and not unfrequently in rivers, in which it seldom flowers if the stream be rapid. There is a variety called *Sea Pondweed,* but the variation is very slight, hardly sufficient to furnish a distinction.

13. Potamogeton Setaceum; *Setaceous Pondweed.* Leaves bristle-shaped, opposite.—Hudson found it in the peaty ditches of Lancashire. It flowers in July and August.—Native of Europe.

14. Potamogeton Contortum. Stem filiform; leaves alternate, subulate-filiform, contorted.—Found in rivulets in Barbary.

Potatoes. See *Solanum.*

Potatoes, Canada. See *Helianthus Tuberosus.*

Potatoes, Spanish. See *Convolvulus Batatus.*

Potentilla; a genus of the class Icosandria, order Polygynia.—Generic Character. *Calix:* perianth one-leafed, flattish, ten-cleft; the alternate segments smaller, reflex. *Corolla:* petals five, roundish, spreading, inserted by their claws into the calix. *Stamina:* filamenta twenty, awl-shaped, shorter than the corolla, inserted into the calix; antheræ elongate-lunulate. *Pistil:* germina numerous, very small, collected into a head; styles filiform, the length of the stamina, inserted into the side of the germen; stigmas obtuse. *Pericarp:* none. Common receptacle of the seeds roundish, juiceless, very small, permanent, covered with seeds, enclosed within the calix. *Seeds:* according to Gærtner, numerous, acuminate, wrinkled. Essential Character. *Calix:* ten-cleft. *Petals:* five. *Seeds:* roundish, naked, fastened to a small juiceless receptacle.——The species are,

* *With pinnate Leaves.*

1. Potentilla Fruticosa; *Shrubby Cinquefoil.* Leaves pinnate; stem shrubby. The whole plant is set with silvery hairs: flowers terminating, solitary, peduncled, of a bright yellow or gold colour, and very ornamental.—Native of Oeland, England, Siberia, China; and between the rivers Delaware and New York, in North America. The beautiful appearance of its flowers has brought it into gardens. Besoms are made of it. It is singular that swine alone, who eat almost every thing, reject this plant, while all other domestic granivorous animals eat it. Flowers in June and July.—In England this plant was first observed a century ago near Greta Bridge in Yorkshire, on the south bank of the Tees below Thorp, where it still grows; and below Eggleston Abbey in Yorkshire. Thousands of this species have been observed near Mickle Force, in Teesdale. The best season for transplanting this species is in October, that it may get new roots before the hard frost sets in; for as it grows naturally upon moist boggy land, when removed in the spring, if due care be not taken to water it in dry weather, it is apt to miscarry. It will not live in a dry hot soil, but thrives exceedingly in a cool moist ground in a shady situation.

2. Potentilla Anserina; *Silvery Cinquefoil; Silverweed; Wild Tansey; Goose* or *Moor Grass.* Leaves interruptedly pinnate, serrate, silky underneath; stem creeping; peduncles one-flowered. Root branched, outwardly dark brown or whitish, furnished with small fibres, and penetrating deep. Few plants render themselves more conspicuous by the whiteness of their leaves, and large golden flowers: in this particular however it is subject to variation, the leaves being sometimes silvery on both sides, and sometimes entirely green, but it is most commonly found with the upper side of the leaves green and the under side silvery; the more clayey the soil, in general the whiter are the leaves. It thrives in most situations, especially in clay, where the water is apt to stagnate, and is common by way-sides; flowering from June to September. Ray observes, that in his time, about Settle in Yorkshire they called the roots *Moors,* and that during the winter the boys dug them up and ate them: he adds, that he was a witness to swine devouring them greedily; and that an apothecary in that neighbourhood assured him that they had a sweet taste like Parsneps. The common people in Scotland frequently eat them either roasted or boiled. In the islands of Tyrie and Col they are much esteemed, as answering in some measure the purposes of bread, and have been known to support the inhabitants for months together during a scarcity of other provisions. In their barren and impoverished soils, and in seasons wherein their crops succeed the worst, the roots of the *Moor Grass* never fail to afford a seasonable relief. The leaves are mildly astringent; dried and powdered, they have been successfully administered in agues: The usual dose is a table-spoonful of the powder every three hours between the fit. The roots are more astringent than the leaves, and may be given in powder, in doses of a scruple or more, in obstinate purgings, attended with bloody stools, and immoderate menstrual discharges. A strong infusion of the leaves stops the immoderate bleeding of the piles; and sweetened with a little honey, it is an excellent gargle for sore throats. Cattle, horses, goats, hogs, and geese, eat it; sheep only decline it. The leaves resemble *Wild Tansey* so much, that it is called *Wild Tansey.* It is a common weed, and increases fast by roots and runners.

2. Potentilla Sericea; *Silky Cinquefoil.* Leaves bipinnate, tomentose on both sides; segments parallel, approximating; stems decumbent. The habit of the leaves is that of the preceding, although they are very small, but it has the stem and fructification of the eighteenth species. Native of Siberia.—This, like most of the following species, is easily increased by seeds, or parting the roots, or both. Autumn is the time for sowing, parting, and transplanting.

4. Potentilla Multifida; *Multifid Cinquefoil.* Leaves bipinnate; segments quite entire, distant, tomentose underneath; stem decumbent. The habit shews much affinity with the twelfth species.—Native of Siberia.

5. Potentilla Fragarioides; *Strawberry-leaved Cinquefoil.* Leaves pinnate and ternate, the outer larger; runners creeping.—Native of Siberia.

5. Potentilla Rupestris; *Rock Cinquefoil.* Leaves lyrate, pinnate, in sevens, fives, and threes; leaflets ovate, serrate, hairy; stem erect.—Native of several parts of Europe and

Siberia, on shady alpine rocks. With us it has only been found in Wales, on the sides of Craig Wreidhin mountain in Montgomeryshire. It requires a moist soil and a shady situation.

7. Potentilla Bifurca; *Bifid-leaved Cinquefoil.* Leaves pinnate, almost equal; leaflets oblong, subbifid, the outmost confluent; root fusiform.—Native of Siberia and Silesia.

8. Potentilla Pimpinelloides; *Burnet-leaved Cinquefoil.* Leaves pinnate; leaflets roundish, toothed, equal; stem erect. It flowers from June to August.—Found in Armenia among rocks, by Tournefort.

9. Potentilla Pennsylvanica; *Agrimony-leaved Cinquefoil.* Lower leaves pinnate, upper ternate; leaflets gash-serrate; stem erect, pubescent. It flowers from June to August.—Native of North America, and Siberia.

10. Potentilla Supina; *Trailing Cinquefoil.* Leaves pinnate; stem dichotomous, decumbent. Root small, white within, covered on the outside with brown scales. It flowers in July.—Native of Germany, Austria, and Siberia.

11. Potentilla Floribunda. Shrub erect, very branchy, and rough; stipules ovate, entire; leaves quinate-pinnate; folioles linear-oblong, revolute at the margin; petioles short; corymbs terminal, dichotomous, multiflorous; segments of the calix subequal; petals subrotund, of the length of the calix.—Grows in bog-meadows, and on the borders of lakes in Canada, and on the mountains of New York and New Jersey; and flowers in July and August.

** *With digitate Leaves.*

12. Potentilla Recta; *Upright Cinquefoil.* Leaves five to seven, lanceolate, serrate, somewhat hairy on both sides; stem erect, corymbose, forked, many-flowered. Blossoms copious, yellow. It flowers in June and July.—Native of Germany, and the south of Europe. A hardy perennial.

13. Potentilla Argentea; *Hoary Cinquefoil.* Leaves in fives, wedge-shaped, gashed, tomentose underneath; stems erect. The flowers appear in succession, and are numerous; the calix downy, as long as the corolla; the petals small, bright yellow, or golden-coloured, and soon shedding. No other species can be confounded with this. The pure whiteness of its leaves, like those of the White Poplar, render this plant conspicuous whenever it is agitated by the wind. It is said to indicate clay underneath the surface.—Native of Europe, and most parts of England. It is found among furze near Heldersham, Gamlingay, and White Wood, in Cambridgeshire; on Henley Park Hill, in Oxfordshire; at Ampthill, Aspley, and Rowney warren, in Bedfordshire; near Harefield in Middlesex; on Blackheath in Kent; at Holt Castle, in Worcestershire; among furze, on the heaths, and also on the walls at Purbeck, Dorsetshire; plentifully about Harrowgate, in Yorkshire; near Snenton in Nottinghamshire; and in the den of Bethaick, near Perth in Scotland. It flowers from June to September.

14. Potentilla Intermedia. Root-leaves in fives; stem-leaves in threes; stem almost upright, very much branched.—Native of Switzerland and Dauphiny.

15. Potentilla Hirta; *Hairy Cinquefoil.* Leaves septenate and quinate, wedge-shaped, gashed, hairy; stem erect, rough-haired. It flowers from May to September.—Native of the south of France, the Pyrenees, and Silesia.

16. Potentilla Stipularis; *Stipular Cinquefoil.* Leaves in sevens, sessile, placed on the dilated stipules.—Native of Siberia.

17. Potentilla Opaca; *Opaque Cinquefoil.* Root-leaves in fives, wedge-shaped, serrate; stem-leaves subopposite; branches filiform, decumbent.—Native of Germany, and some parts of the south of Europe.

18. Potentilla Aurea; *Golden Cinquefoil.* Root-leaves in fives, obovate, gash-serrate, hairy, submembranaceous; stem-leaves in threes; stem almost upright.—Native of the mountains of Scotland, Denmark, Switzerland, Austria, Silesia, and Dauphiny. It flowers in July.

19. Potentilla Verna; *Spring Cinquefoil.* Root-leaves in fives, wedge-shaped, serrate, marked with lines, ciliate, subcoriaceous; stem-leaves in threes; stem declined. The whole plant is beset with soft shining silky hairs. The stems spread very widely in a circular direction among the grass. As the season advances, both they and the leaves turn red, which colour, intermixed with the bright yellow of the flowers, makes a striking contrast.—Native of the dry elevated pastures in most parts of Europe: it has been long found near Pontefract, and in other parts of Yorkshire; near Preston, Giggleswick, and Carr End, Wensley Dale, in Lancashire; many years ago at Bury in Suffolk; on Gogmagog hills, near Cambridge; in Glogaeth, Caernarvonshire, North Wales; and in Scotland, near Arthur's seat, in the king's park, Edinburgh, as well as on Braid Hills, Craig Lochart, and other mountainous elevations.—There are so many varieties which approach so closely to many other species, that Haller observes, its character and synonyms are very difficult to make out.

20. Potentilla Astracanica; *Astrachan Cinquefoil.* Root-leaves and lowest stem-leaves quinate; stems villose, decumbent at the base, dichotomous.—Native of Asia, received by Jacquin from Astracan.

21. Potentilla Canadensis; *Canadian Cinquefoil.* Leaves quinate, villose; stem ascending, hirsute.—Native of Canada.

22. Potentilla Alba; *White Cinquefoil.* Leaves quinate, silky underneath, converging, serrate at the tip; stems filiform, procumbent; receptacles very hirsute.—Native of the south of France, Germany, Switzerland, Austria, Carniola, and Hungary.

23. Potentilla Caulescens; *Alpine Cinquefoil.* Leaves quinate, converging, serrate at the tips; stems many-flowered, decumbent; receptacles hirsute; petals oblong.—Native of Austria, Switzerland, Silesia, Dauphiny, and Piedmont. It may be increased by runners, like Strawberries, in autumn, in a cool soil and shady situation.

24. Potentilla Clusiana; *Clusius's Cinquefoil.* Leaves quinate, converging, serrate at the tip; stems many-flowered, decumbent; receptacles hirsute; petals roundish. This is an elegant species, growing among the Alpine rocks.—Native of Austria.

25. Potentilla Nitida; *Shining Cinquefoil.* Leaves subternate, tomentose, converging, three-toothed; stems one-flowered; receptacles woolly.—Native of Monte Baldo, Dauphiny, and Austria.

26. Potentilla Valderia. Leaves septenate, obovate, serrate, tomentose; stem erect; petals shorter than the calix; receptacles woolly. The whole plant is silky hoary, with the stems and petioles evidently subhirsute.—Native of the mountains of Piedmont and Dauphiny.

27. Potentilla Reptans; *Common Creeping Cinquefoil,* or *Five-leaved Grass.* Leaves in fives, obovate, serrate; stem creeping; peduncles one-flowered. Root fusiform, with few fibres, penetrating deep, the size of the little finger, when old outwardly of a dark chestnut colour; the stems are long and trailing; the leaves are upright, green, and rather hairy; and the flowers large, and yellow, whose stalks are taller than the foliage. Flowering from June to September.—Native of Europe, generally found in meadows and by way-sides. The roots have a bitterish styptic taste. They were used by Hippocrates and Dioscorides, and by the former particularly recommended for the cure of intermittents. The medicinal quality is con-

fined to the red cortical part of the root, and depends merely upon its astringent effects; it has therefore chiefly been prescribed internally in diarrhœas and other fluxes, and externally in gargles for loose teeth and spongy gums, and in astringent lotions: but its efficacy, except in large doses, is inferior to many other plants of this class. The bark of the root, says Withering, is a mild astringent, and powerfully resists putrefaction. Reduced to powder, and taken in doses of about a scruple, it stops purging, and is good in all kinds of hæmorrhages, but more particularly in excessive menstrual discharges, and spitting of blood. Taken in larger doses, it will frequently cure intermitting fevers and agues. A strong decoction of it is good for sore mouths. The leaves infused in the manner of tea, are much used by country people to allay the heat in burning fevers. The roots boiled in vinegar, and applied in form of a poultice, disperse swellings or inflammations in any part of the body; and applied to old putrid sores, cleanse and dispose them for healing. The juice is good to bathe inflamed and sore eyes with; and, drank to the amount of four ounces a day for several days together, is said to be almost a certain cure for the jaundice. It is likewise serviceable in the whites, and other disorders of the sex. The roots have also been used for tanning leather. As all our domestic quadrupeds will eat the leaves, it is not an unwelcome plant in pastures. It is increased by roots and runners.

28. Potentilla Pumila. Plant erect, subacaul, pubescent; leaves quinate, cuneiform, cut, lanuginose; peduncles shorter than the petiole, simple, one-flowered; petals roundish, scarcely longer than the calix.—Grows in dry fields and pastures, from Canada to Virginia, and flowers from May to July.

29. Potentilla Simplex. Plant erect, simple, rough; stipules cut; leaves quinate, oblong-oval, coarsely serrated, superior, sessile; peduncles axillary, solitary, elongate, uniflorous; segments of the calix linear lanceolate; petals rotund-obcordate, longer than the calix; flowers yellow.—Grows in fields, meadows, and dry woods, from Canada to Carolina.

30. Potentilla Dissecta. Plant erect, branchy, slightly glabrous; leaves quinate; folioles pinnatifid; segments entire, acute; flowers terminal, subcorymbose.—Grows near Hudson's Bay.

**** With ternate Leaves.*

31. Potentilla Monspeliensis; *Montpelier Cinquefoil.* Leaves ternate; stem branched, erect; peduncles springing out above the joints. The flowers are white and large. Perennial.—Native of the south of France. The seeds of this, if permitted to scatter, will produce plenty of plants in the spring.

32. Pontentilla Speciosa; *Silvery Cretan Cinquefoil.* Leaflets three, elliptical, obtuse, toothed, downy beneath; stem shrubby. Petals white.—Native of the hills of Crete, &c.

33. Potentilla Tridentata; *Trifid-leaved Cinquefoil.* Leaves ternate, wedge-shaped, trifid at the tip.—Native of Newfoundland and Greenland. It flowers in June.

34. Potentilla Nivea; *Snow-white Cinquefoil.* Leaves in threes, gashed, tomentose underneath; stem ascending. Petals yellow.—Native of Siberia.

35. Potentilla Grandiflora; *Great-flowered Cinquefoil.* Leaves in threes, toothed, somewhat hairy on both sides; stem decumbent, longer than the leaves; root perennial. It flowers in July, and the seeds ripen in autumn.—Native of Switzerland, Dauphiny, the Pyrenees, and Siberia.

36. Potentilla Subacaulis; *Stemless Cinquefoil.* Leaves ternate, toothed, tomentose on both sides; scape decumbent.—Native of the south of France, Granada, Siberia, and Japan.

37. Potentilla Hirsuta. Plant erect, simple, very rough; stipules lanceolate, entire; leaves ternate, oboval, laciniate-incise; panicles with few flowers; pedicels short; petals shorter than the calix; flowers white, small.—Grows in Canada, and the western parts of New York.

38. Potentilla Emarginata. Plant rough; stipules ovate, very entire; leaves ternate; folioles sessile, inciso-dentate, rough on both sides; pedicels few, terminal, elongate, with one flower; petals cuneate-oblong, emarginate, as long again as the calix.—Grows in Labrador. A small plant.

39. Potentilla Norwegica. Plant erect, branchy, pubescent; stipules oval, dentated; leaves ternate, rhomb-lanceolate, inciso-dentate; branches dichotomous; pedicels short, axillary, solitary; petals pale yellow, shorter than the calix.—Native of Norway, Sweden, &c. Grows also in the fields of Canada and New York, and flowers in June and July.

Poterium; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flowers,* in a spike. *Calix:* perianth three or four leaved; leaflets ovate, concave, spreading, permanent. *Corolla:* one-petalled, four-parted. *Stamina:* filamenta very many, thirty to fifty, capillary, very long, flaccid; antheræ roundish, twin. *Female Flowers,* in the same spike, above the male. *Calix:* perianth as in the male. *Corolla:* one-petalled, wheel-shaped; tube short, roundish, converging at the mouth; border four-parted; segments ovate, flat, reflex, permanent. *Pistil:* germina two, ovate-oblong, within the tube of the corolla; styles two, capillary, coloured, flaccid, the length of the corolla; stigmas pencil-form, coloured. *Pericarp:* berry formed of the tube of the corolla, hardened, thickened, closed. *Seeds:* two; according to Gærtner, inverted. *Observe.* The fifth species has a fleshy globular berry, with oblong cylindrical seeds; the first has a juiceless angular berry, with four-cornered seeds, acuminate at both ends, and two weak pistilla inserted into the male flowers. Gærtner, who joins this genus with *Pimpinella,* calls the fruit a drupe. Essential Character. *Male. Calix:* four-leaved. *Corolla:* four-parted. *Stamina:* thirty to forty. *Female. Calix:* four-leaved. *Corolla:* wheel-shaped, four-parted. *Pistilla:* two. *Berry:* formed of the hardened tube of the corolla.——The species are,

1. Poterium Sanguisorba; *Lesser,* or *Upland Burnet.* Unarmed, with the stem somewhat angular: root perennial, penetrating deep into the earth.—This plant has the habit of Great Burnet: the leaves when bruised smell like Cucumber, and taste something like the paring of that fruit; they are sometimes put into salads and cool tankards: they are mildly astringent, and used in dysenteries and hæmorrhages. There are great authorities for and against the introduction of this plant into our pastures; and Mr. Young thus sums up the result of their conflicting evidence: That it is a good pasture in some places, and a bad one in others, he looks upon as highly improbable; and imputes the diversity of accounts to circumstances unrelated, or, in some instances, perhaps to prejudice. Cattle, the same accurate author remarks, may have been turned into it after it had got a head, and was near seeding, when it is generally agreed they will not eat it. This, however, is not, he observes, peculiar to this plant, but also to others; for what is Ray-grass good for as feed after summer? The seed of Burnet having fetched a good price, much has been seeded, and the *straw* has been often confounded with the *hay.* The original intention of it was for a winter pasture; and in that season cattle will eat and thrive on food, which at other times they will not touch. This important circumstance has been too little

noticed. Cattle may be turned into a Burnet field so hungry that they might feed on it for a time, without proving it to be good food in general. From actual practice, however, the following facts may be deduced. First, the balance of the account is greatly in favour of horses eating it in the common manner of all other food. Secondly, we cannot deny it to be a good food for sheep, as the balance of experiment inclines greatly in its favour. Thirdly, in a few instances cows and oxen dislike it, but in many they eat it freely. Thus, upon the whole, the reports are favourable: but the proper application of Burnet seems to be, to leave it a good head in autumn ready for sheep in the spring, for them to keep it down as close as possible about two months, upon the plan of Ray Grass, and to let it stand afterwards for hay; but the most advantageous method seems to be, to sow it with other Grasses in laying down land to pasture. Subsequent trials have confirmed Mr. Young's judgment, from which he collects the following advantages, derived by properly cultivating this plant on a suitable soil. The produce of it, both in hay and seed, is considerable; the pasturage, not only in autumn and spring, but in winter, maintaining its growth and verdure in drought and frost, render it particularly valuable: in general cattle and sheep are fond of it, and grow fat by it; the milk, cream, and butter of cows fed upon it, are excellent in quality, and great in quantity: it will flourish and afford large crops on sandy, gravelly, and shaley soils. These are valuable qualities, and yet Burnet is not cultivated to any great extent, because it is not universally admitted that cattle and sheep will always eat it.—There are some varieties scarcely worth mentioning: as, one that is much smoother; a second, that has no smell; and a third, with larger seeds.—It is easily propagated in gardens for salads, by seeds sown in autumn soon after they are ripe. If the seeds be permitted to seatter, the plants will come up in plenty; and if these be transplanted into a bed of undunged earth, at about a foot distance every way, and kept clean from weeds, they will continue some years without further care, especially if the soil be dry. It may be increased by parting the roots in autumn; but as it grows so freely from seeds, this method is seldom adopted.—Mr. Roeque directs the ground to be prepared for Burnet in the same manner as for Lucerne: to be ploughed or trenched as deep as the staple will admit, and to be well dunged; the seed to be sown broad-cast, without corn, twelve pounds to the acre, in April or any of the succeeding months, till August: before sowing, harrow and roll; after sowing, harrow with a light harrow, and roll again; ten days after, the seed will come up with a round leaf; but it is generally said by others, that the seed takes about twenty-three days to vegetate: keep the crop very clean the first year, and it will keep itself clean afterwards. Unless it be sown early, Burnet must not be grazed the same summer, because when young it bleeds too much; but it should be left till February or March; it may then be fed till the beginning of May, when the cattle should be taken out, and it may be mowed for seed about the middle of June. The same agriculturist, who directs the ground to be prepared alike for Burnet and Lucerne, says, in order to grow Burnet after Turnips are cleared off, in March plough the same depth as was ploughed for the Turnips: then about the middle of May to trench-plough it, to break the staple and facilitate the growth of the roots. In the middle of June trench-plough again, but no deeper than the first time, not to bring up the dead earth. Harrow and roll well, and then sow; after which run a light harrow over it, not to bury the seed too deep, and then roll it again: then let it lie till August, when, if there are any weeds, harrow backwards and forwards, and hoe or handweed it if necessary. A dry soil suits it best. It grows in stony and gravelly lands, but its natural bed is calcareous. The ill success which has sometimes attended this crop, may perhaps be principally owing to its having been sown in an improper soil. It will not do where water settles on the surface, or on a wet bottom, nor on newly broken up land, except after Oats or Potatoes; and the ground should be worked very fine for its reception. For hay, it should be mown when in full blossom. When mown for seed, much of it will be lost; for what is full ripe is apt to shed, and, as it ripens successively, some will be quite green when the forwardest is quite mature.

2. Poterium Ancistroides. Suffruticose: leaflets very smooth, roundish, deeply toothed; flowering-stem angular, procumbent.—Native of Barbary, near Tlemsen, in the fissures of rocks, flowering early in the spring.

3. Poterium Hybridum; *Sweet Burnet.* Unarmed: stems cylindrical, strict.—Native of the south of France, Italy, and Hungary. Sow the seeds in autumn, and the plants will come up in spring: thin and keep them clean from weeds. The second year they will flower, ripen their seeds, and decay.

4. Poterium Caudatum; *Smooth Shrubby Burnet.* Unarmed, frutescent: branches round, villose; spikes elongated, loose.—Native of the Canary Islands. This and the next species may be increased by slips or cuttings, planted in a bed of light earth during any of the summer months, covering them close with a hand or bell glass, or shading them from the sun. When they have taken root, take them up, and plant them singly in small pots, filled with fresh undunged earth. Place them in the shade till they have struck root, and then remove them to a sheltered situation. When frosts come on, place them under a hot-bed frame. They require little water, especially in cold weather.

5. Poterium Spinosum; *Prickly Shrubby Burnet.* Stem shrubby, with branched spines; branches villous, somewhat angular; spikes oblong, lax. A bushy prickly shrub, with abundance of small pinnate leaves, and oblong purplish spikes.—Native of the Levant.

Pothos; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Calix:* spathe globular, one-leafed, gaping on one side; spadix quite simple, thickened, covered all over with sessile fructifications; perianth none, unless the corolla be taken for it. *Corolla:* petals four, wedge-shaped, oblong, erect. *Stamina:* filamenta four, flattish, erect, narrower than the petals, and of the same length; antheræ very small, twin. *Pistil:* germen parallelopiped, truncate; style none; stigma simple. *Pericarp:* berries aggregate, roundish, two-celled. *Seed:* single, roundish Essential Character. *Spathe:* spadix simple, covered *Perianth:* none. *Petals:* four. *Berries:* two-seeded.—— The species are,

1. Pothos Scandens; *Climbing Pothos.* Petioles the breadth of the leaves; stem rooting. This shrub climbs like Ivy, throwing out fibres by which it adheres to walks, and the trunks of trees.—Native of the East Indies.

2. Pothos Acaulis; *Stemless Pothos.* Leaves lanceolate, quite entire, nerveless. This species also is parasitical, and in habit resembles the Aloe. It is called *Rat's Tail* by the French in Martinico, from the form of the flowering spadix. —Native of South America, and the West Indies.

3. Pothos Lanceolata; *Lance-leaved Pothos.* Leaves lanceolate, quite entire, three-nerved; scape three-sided at the tip.—Native of South America.

4. Pothos Crenata; *Notch-leaved Pothos.* Leaves lanceolate, crenate,—Native of the island of St. Thomas.

5. Pothos Violacea; *Violet-fruited Pothos.* Leaves ovate-lanceolate, entire-nerved, dotted. This is a subparasitical plant, with thick, long, simple, smooth, whitish roots.—Browne observed it in the island of Jamaica, of which it is a native, in the woods above St. Ann's Bay; and says that it sticks pretty close to the trunk of whatever tree it grows upon, but seldom runs above two or three feet in length. Aublet found it in Guiana.

6. Pothos Crassinervia; *Thick-nerved Pothos.* Leaves oblong, acuminate, quite entire, veined, with the midrib of the leaf three-keeled. The whole plant is smooth; the roots are numerous.—This is a parasitic species, growing on trees in hilly woods in South America.

7. Pothos Cordata; *Heart-leaved Pothos.* Leaves cordate; lobes imbricate; spadix nearly equal to the spathe.—Native of South America.

8. Pothos Macrophylla; *Large-leaved Pothos.* Leaves cordate; lobes divaricate; spadix much longer than the spathe. This is a subparasitical stemless plant: the leaves are about two feet long, ribbed, and veiny; the spadix above a foot long, covered with brown flowers.—Native of the West Indies and Guiana.

9. Pothos Pinnata; *Pinnate-leaved Pothos.* Leaves pinnatifid; plant six feet high, and stemless.—Native of the East Indies and Cochin-china.

10. Pothos Palmata; *Palmate-leaved Pothos.* Leaves palmate; lobes nine, lanceolate, blunt.—It is a parasitic on the barks of trees in South America.

11. Pothos Digitata; *Digitate-leaved Pothos.* Leaves digitate, of about nine, oblong, sharpish leaflets. This is a smooth plant, with a thick climbing stem, throwing out long thick radicals. The spathe is finger-shaped, upright, and about two inches long, and very thickly covered with flowers; the petals are white with green tips.—Native of the hotter parts of South America, where it is parasitical on trees.

12. Pothos Pentaphylla; *Five-leaved Pothos.* Leaves digitate, quinate, ovate, acuminate.—Native of woods in Cayenne.

13. Pothos Fœtida; *Stinking Pothos,* or *Scunk Weed.* Leaves cordate; spadix subglobular. This is a hardy perennial, flowering in March and April, before the flowers appear. The flowers exhale a very fetid odour, and are sessile, close to the ground.—Native of North America.

14. Pothos Cannæfolia; *Sweet-scented Pothos.* Leaves elliptical, with simple parallel veins. Leaves radical, pointed; flowers whitish, and sweet-scented.—Native of the West Indies.

Prasium; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, campanulate, turbinate, erect, bilabiate; upper lip wider, semitrifid, acute; lower lip a little smaller, two-parted. *Corolla:* one-petalled, ringent; upper lip erect, ovate, obsoletely emarginate, concave; lower lip wider, trifid, reflex; the middle segment larger. *Stamina:* filamenta four, awl-shaped, pressed to the upper lip, spreading, shorter than the upper lip, two shorter than the two others; antheræ oblong, lateral. *Pistil:* germen quadrifid; style filiform, the length and situation of the stamina; stigma bifid, acute, with one segment shorter. *Pericarp:* berries four, at the bottom of the calix, roundish, one-celled. *Seeds:* solitary, roundish. *Observe.* The seeds themselves, being clothed with a berried epidermis, have the nature of a berry: hence we have a tetragymnospermous bacciferous plant, by which mark it is distinguished from all other plants of this order. Essential Character. *Berries:* four, one-seeded.——The species are,

1. Prasium Majus; *Great Spanish Hedge-Nettle.* Leaves ovate-oblong, serrate. This rises with a shrubby stalk two feet high, covered with a whitish bark, and divides into many branches. The flowers come out from the bosoms of the leaves in whorls round the stalks; they are white, and have large permanent calices, cut into five points. It flowers here from June to August. Native of Spain, Italy, Sicily, Tunis, and Algiers, in hedges.—This, and the next species, may be propagated either by cuttings or from seeds; if by cuttings, they should be planted on a shady border towards the end of April. The cuttings ought not to be taken from such plants as have been drawn weak, but rather from those which have been exposed to the open air, the shoots of which are short and strong; and if a joint of the former year's wood be cut to each of them, they will more certainly succeed. These cuttings may remain in the same border till they are well rooted, and then transplanted into pots that they may be sheltered in winter under a common frame, where they may have as much free air as possible in dry weather, but only require to be screened from hard frost.—If they be propagated by the seeds, which the plants produce in abundance annually, the seeds should be sown on a bed of light earth in April, and in May the plants will come up, when they require no other care but that of keeping them clean from weeds; and in the autumn following they may be transplanted in the same manner as above directed for those raised from cuttings, and may afterwards be less tenderly treated as they acquire strength. A plant or two of each, may be allowed to have a place where there are collections of the different sorts of evergreen shrubs, for the sake of variety; especially where the different sorts of Cistus Phlomis, Tree Wormwood, and Medicago, are admitted, because these are equally hardy; and when a severe winter happens, which destroys the one, the others are sure of the same fate; but in mild winters they will live abroad, especially if planted in a dry rubbishy soil, and have a sheltered situation.

2. Prasium Minus; *Small Sicilian Hedge-Nettle.* Leaves ovate, with a double notch on each side. This has a shrubby stalk like the former, but rises a little higher; the bark is whiter. The flowers are somewhat larger, and are frequently marked with a few purple spots.—Native of Sicily.

Premna; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, campanulate, subbilobate, with the upper segment emarginate, permanent. *Corolla:* one-petalled, irregular, tubulous; mouth quadrifid, blunt; the two upper segments erect, shorter, the others spreading. *Stamina:* filamenta four, erect, middling, the two lower shorter; antheræ roundish. *Pistil:* germen roundish; style cylindrical, shorter; stigma bifid. *Pericarp:* berry globose, four-celled. *Seeds:* solitary, bony, one side rounded, the other angular. Essential Character. *Calix:* two-lobed. *Corolla:* four-cleft. *Berry:* four-celled. *Seeds:* solitary.——This is a tropical genus of shrubs, of which nine species have been described; six are natives of New Holland, the rest of the East Indies. The two following are given as specimens.

1. Premna Integrifolia. Leaves elliptical, quite entire. This is a small tree, much resembling the next species, and perhaps only a variety of it.—Native of the East Indies.

2. Premna Serratifolia. Leaves serrate; branches round, purplish, with truncated margined scars on them from the fallen leaves.—Native of the East Indies.

Prenanthes; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common calicled, cylindrical, smooth; scales of the cylinder the number of the corollets; scales of the base few, unequal, very

short. *Corolla:* compound, mostly of a single ring of florets; corollets hermaphrodite, five to eight and more, equal; proper monopetalous, ligulate, truncate, four-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubulous. *Pistil:* germen subovate; style filiform, longer than the stamina; stigma bifid, reflex. *Pericarp:* none; calix cylindrical, converging very slightly at the mouth. *Seeds:* solitary, cordate; pappus capillary, sessile. *Receptacle:* naked. ESSENTIAL CHARACTER. *Calix:* calicled. *Florets:* in a simple row. *Pappus:* simple, subsessile. *Receptacle:* naked.—These plants are seldom admitted into gardens, but the seeds may be sown soon after they are ripe, in a sheltered situation; and when the plants come up, they require no other care but to keep them clean from weeds. ——The species are,

1. Prenanthes Tenuifolia; *Fine-leaved Prenanthes.* Leaves linear, quite entire. Root perennial, oblong, twisted, oblique, creeping, and here and there putting forth other straight roots.—Native of the south of Europe, where it is found upon mountains.

2. Prenanthes Chinensis; *Chinese Prenanthes.* Leaves linear, ensiform, entire, and toothed. The whole plant is smooth; flowers panicled, yellow.—Native of China and Japan.

3. Prenanthes Viminea; *Rushy-twigged Prenanthes.* Fragments of the leaves adhering to the stem. Root biennial or perennial, oblong, pale yellow; stems decumbent, from a foot or eighteen inches to two feet or even three feet in length, hard, round.—Native of the south of Europe; it flowers in June and July.

4. Prenanthes Purpurea; *Purple Prenanthes.* Florets five; leaves lanceolate, toothletted. Root perennial, transverse, long, woody, fibrous; stem erect, three, four, or five feet high, much branched towards the top, terminating by nodding panicles of crimson or purplish flowers, placed on naked axillary peduncles, longer than the leaves.—Native of France, Germany, Switzerland, Austria, the south of France, and Italy. It flowers from July to September.

5. Prenanthes Muralis; *Wall Prenanthes.* Florets five; leaves runcinate, toothed, their terminal lobe five-angled. Root perennial, somewhat woody, branched, pale brown, milky. Flowers yellow, drooping before they expand. The whole plant smooth, tender, brittle, milky. There is a variety of it with the upper leaves undivided.—Native of many parts of Europe, in woods, hedges, and shady banks, in a calcareous soil, and on walls; flowering from July to September. Found near Hampstead heath, and near Hornsey, in Middlesex; on the Willows by the old sluice at Grantchester; on Chippenham park wall; on the top of Staunton, Harcourt-kitchen, and in Stokenchurch woods, Oxfordshire; at Bishopsgate street in Norfolk; at Welwyn in Herefordshire; at Croydon in Surry; at Cleifden in Buckinghamshire; at Weekly in Northamptonshire; at Basford in Nottinghamshire; and at Peak's Hole in Derbyshire.

6. Prenanthes Altissima; *Tall Prenanthes.* Florets five; leaves three-lobed; stem erect. The flowers come out from the side of the stem in small bunches; they are of a pale yellow colour, and appear in July. There is a variety with pale purple flowers, arising from the same seeds.—Native of Virginia and Canada, where it is called Dr. Witt's Rattlesnake Root, the roots being taken for an antidote to the venom of the rattlesnake.

7. Prenanthes Chondrilloides; *Chondrilla-like Prenanthes.* Florets ten; calices eight-cleft; leaves lanceolate; root-leaves undivided, somewhat toothed; stem panicled.—Native of the south of Europe.

8. Prenanthes Japonica; *Japonese Prenanthes.* Florets fifteen; root-leaves lyrate; stem almost naked; flowers terminating, panicled, yellow.—Native of Japan.

9. Prenanthes Alba; *White-flowered Prenanthes.* Florets very many; flowers nodding, subumbelled; leaves hastate, angular. It flowers in July and August. Root perennial; stem herbaceous, two feet high; flowers plentiful, white, with a purple calix. This plant has a peculiar fragrant smell.—Native of North America.

10. Prenanthes Repens; *Creeping Prenanthes.* Creeping; leaves three-lobed; stem creeping, rooting.—Native of Kamtschatka.

11. Prenanthes Pinnata; *Pinnate-leaved Prenanthes.* Shrubby: leaves unequally pinnate, many-paired; leaflets linear, quite entire; panicle compound. This shrub has roundish resinous branches; flowers small, yellow.—Found on the rocks at the island of Teneriffe.

12. Prenanthes Integra; *Entire-leaved Prenanthes.* Leaves oblong, entire, smooth; panicle contracted; root annual. The whole plant smooth; stem decumbent at bottom, and creeping, then erect, round, striated, simple or panicled, a span high; flowers yellow.—Native of Japan.

13. Prenanthes Debilis; *Weak Prenanthes.* Leaves ovate, entire; stem almost naked, erect. The whole plant is tender and smooth; root annual, fibrous; flowers yellow.—Native of Japan.

14. Prenanthes Dentata; *Tooth-leaved Prenanthes.* Leaves oblong, toothed, smooth; stem panicled; flowering branches rod-like, erect, panicled; root-leaves petioled, oblong, blunt, with a point toothletted.—Native of Japan.

15. Prenanthes Hastata; *Halbert-leaved Prenanthes.* Leaves hastate, embracing, toothed; stem branched. The whole plant is smooth; flowers on the extreme branches and branchlets terminating, panicled, yellow.—Native of Japan.

16. Prenanthes Humilis; *Dwarf Prenanthes.* Leaves lyrate; lobes obtuse; stem almost naked; flowers terminating in twos or threes; root annual, fibrous. The whole plant smooth.—Native of Japan.

17. Prenanthes Multiflora; *Many-flowered Prenanthes.* Leaves petioled, runcinate; lobes acute, toothed; panicle fastigiate, diffused. Root fibrous, annual; stem branched at the bottom, erect, grooved, villose, smooth at top, panicled, two feet high.—Native of Japan.

18. Prenanthes Lyrata; *Lyrate-leaved Prenanthes.* Leaves runcinate, lyrate-toothed: panicle contracted. Root fibrous, annual.—Native of Japan.

19. Prenanthes Squarrosa. Leaves sessile, runcinate; segments recurved, toothed. Stem fleshy, herbaceous, round, striated, smooth, erect, simple, two feet high; panicle oblong, thyrsoid.—Native of Japan.

20. Prenanthes Juncea. Stem very branched, sulcated, glabrous; leaves cauline, remote, subulate, very short; branchlets uniflorous; calices five-cleft, five-flowered; follicles membranaceous at the margin; flowers purple.—Grows on the banks of the Missouri.

21. Prenanthes Virgata. Plant glabrous, from three to six feet; stem very simple; all the leaves lyrate-sinuate; branchlets subsecund; flowers pendulous, pale purple; calices glabrous, eight-cleft, ten-flowered.—Grows in sandy fields, near ditches, from New Jersey to Carolina.

22. Prenanthes Crepidina. Leaves lato-lanceolate, unequally angulate-dentate; panicles with terminal fascicles, few-flowered, waving; calices rough, from ten to twelve cleft.—Grows in Illinois, and on the high mountains of Carolina.

23. Prenanthes Serpentaria. Leaves dentate, rough; radical leaves palmate-sinuate; stem-leaves petiolate, sinuate-

pinnatifid, subtrilobous; intermediate segments tripartite, the highest lanceolate; branches terminal, subpaniculate, short, waving; calices eight-cleft, twelve-flowered; flowers pale purple. Grows on the mountains of Virginia and Carolina. —This plant is known by the inhabitants under the name of Lion's-foot; and is in high esteem as a specific in curing the bite of the rattlesnake. Pursh, in his travels through the mountains of Virginia, had an opportunity of being a witness of the efficacy of this remedy. "A man," says he, "living in Cove-mountains, near the Sweet Springs, was bit in the foot by a Mocassin snake, a species considered the most dangerous. An inflammation and swelling of his whole leg took place immediately; but by taking the milky juice of this plant boiled in milk, inwardly, and applying to the wound the steeped leaves, which were very frequently changed, he was cured in a few days." As this plant deserves the attention of the physician, we have given a figure of it, it being frequently confounded with the sixth species. Gronovius, in his *Flora*, mentions Dr. Witt's *Snakeroot* under Prenanthes Autumnalis, or Willdenow's Rubicunda, as a remedy for the bite of the rattlesnake; which shews that he had information of the use made of this plant, though he did not know the genuine species. In the *Banksian Herbarium*, is a specimen of Prenanthes Rubicunda, with the following note in the hand-writing of Clayton. "This is the Rattlesnake Root that Dr. Witt supposes to be the best cure for the bite of a snake; a very odd plant, hardly two leaves alike upon a plant, as to shape, or the indentings of the leaves."

Prickly Parsnep. See *Echinophora.*

Prickly Pear. See *Cactus.*

Primrose. See *Primula.*

Primrose, Nightly, or *Tree.* See *Œnothera.*

Primrose, Peerless. See *Narcissus.*

Primula; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* involucre many-leaved, many-flowered, very small; perianth one-leafed, tubular, five-cornered, five-toothed, acute, erect, permanent. *Corolla:* monopetalous; tube cylindrical, the length of the calix, terminated by a small hemispherical neck; border spreading, half five-cleft; segments obcordate, emarginate, obtuse; throat pervious. *Stamina:* filamenta five, very short, within the neck of the corolla; antheræ acuminate, erect, converging, included. *Pistil:* germen globular; style filiform, the length of the calix; stigma globular. *Pericarp:* capsule cylindrical, almost the length of the perianth, covered, one-celled, opening with a ten-toothed top. *Seeds:* numerous, roundish. *Receptacle:* ovate-oblong, free. Essential Character. *Capsule:* of one cell, with ten teeth. *Corolla:* tube cylindrical, with a spreading mouth. *Stigma:* globose. ——The species are,

1. Primula Verticillata. Leaves serrate, smooth; flowers in whorls.—Native of Mount Kurma, by rivulets.

2. Primula Vulgaris; *Common Primrose.* Leaves toothed, wrinkled; scapes one-flowered; border of the corolla flat. Root perennial, growing obliquely, appearing as if bit off at the end, beset with thick reddish scales which are the remains of past leaves, sending down numerous very long round whitish fibres; it has a singular smell, somewhat like that of Anise. Leaves light green, four or five inches long, but much larger after flowering. Flower-stalks numerous, simple; flowers of a pale sulphur-colour, upright, large, sweet-scented. Its varieties are very numerous, partly wild and partly obtained from culture. They are much esteemed by florists under the name of *Polyanthi;* on this account we shall dilate on their qualities, and best mode of propagation. The names of the most esteemed are: 1. The Single White. 2. The Paper White. 3. The Red or Purple of various shades. 4. The Hose in Hose. 5. The Double Yellow. 6. The Deep Velvet Red. 7. The Pale or Flesh-coloured. 8. The Dingy Purple, which grows wild in Scotland. The requisites to constitute a fine Polyanthus are, a graceful elegance of form, a richness of colouring, and a perfect symmetry of parts. Its qualities are much the same as those of the Auricula, as to the stem or scape, the peduncles or flower-stalks, and the formation of the umbel, bunch, or thyrse, corruptly called the truss. The tube of the corolla above the calix should be short, well-filled at the mouth with the antheræ, and terminate fluted, rather above the eye. The eye should be round, of a bright clear yellow, and distinct from the ground colour. The ground colour is most admired when shaded with a light and dark rich crimson, resembling velvet, with one mark or stripe in the centre of each division of the border, bold and distinct from the edging down to the eye, where it should terminate in a fine point. The petals, technically called the pips, should be large, quite flat, and perfectly circular, excepting the small indentures between each division, which separate it into five, and sometimes six, heart-like segments. The edging should resemble a bright gold lace, bold, clear, and distinct, and so nearly of the same colour, as that the eye and stripes are scarcely to be distinguished.—The roots are good as a sternutatory for the head; the best way of using them is to bruise them, and express the juice, which being snuffed up the nose, occasions violent sneezing, and brings away a great deal of water, but without being productive of any bad effect, which is too often the case with remedies of this class. Dried and reduced to powder, it will produce the same effect, but not so powerfully. In this state it is said to be good for nervous disorders, but the dose must be small. The above prescription is from Hill; and Gerarde says, that a drachm and a half of the dried roots, which are taken up in autumn, acts as a strong but safe emetic.—*Culture.* The roots of the wild plants of this, and the two following species, may be taken up and transplanted into gardens at Michaelmas, that they may have strength to produce their flowers early in the spring. They delight in a strong soil, but will grow in almost any sort of earth in shady situations. The beautiful varieties of *Polyanthus* are produced by sowing the seed saved from plants with large upright stems, producing on each stalk many flowers, being large, striped, open, flat, and are not pin-eyed; as from the seeds of such flowers there is room to hope for a great variety of good sorts; but there should be no ordinary flower stand near them, lest by the mixture of the farina their seeds should be degenerated. These seeds should be sown in boxes filled with light rich earth in December, taking great care not to bury the seed too deep, as it will be sufficient to cover it slightly with light earth. These boxes should be placed where they may have the benefit of the morning sun until ten o'clock, but must by no means be exposed to the heat of the day, especially when the plants begin to appear; for at that time a single day's sun will destroy them. If the spring prove dry, refresh them often with water in very moderate quantities, and remove the boxes more into the shade as the heat increases. By the middle of May these plants will be strong enough to plant out, at which time prepare some shady borders made rich with cow-dung, upon which you must set the plants about four inches asunder every way, observing to water them until they have taken root; after which they will require no further care but to keep them clear from weeds, until the latter end of August following, when you should prepare some borders which are exposed to the east, with good light rich

earth, into which they should be transplanted, placing them six inches asunder, equally in rows; observing, if the season prove dry, to water them until they have taken root. In these borders the plants will flower in the succeeding spring, when such of them as are unusually fine should be marked to be preserved, and the rest may be transplanted into wildernesses and other shady places in the garden, where, although they are not very valuable flowers, they will afford an agreeable variety. Those plants which you intend to preserve, may be removed soon after they have done flowering, provided it be not intended to save seeds from them. They may then be transplanted into a fresh border of the like rich earth, allowing them the same distance as before, observing also to water them until they have taken root; after which they will require no further care except to keep them clean from weeds, and as their roots will be in full vigour in the spring, they will then produce strong flowers, or, if the kind be good, they will be little inferior to a show of Auriculas. These roots should be constantly removed and parted every year, and the earth of the border changed; otherwise they will degenerate, and lose the greatest part of their beauty. If you intend to save the seeds, which is the method to obtain a great variety, mark such of them as have good properties. These should be, if possible, separated from all ordinary flowers, for if they stand surrounded by such as are plain-coloured, they will impregnate each other, whereby the seeds of the valuable flowers will not be near so good. The best way therefore is to take out the roots of the inferior sorts, and plant them in another place as soon as the flowers open. The flowers of those plants intended for seed, when growing in large bunches, should not be gathered, but those only that are produced singly upon pedicels. In dry seasons the former must be now and then refreshed with water, which will increase the size and number of their seeds, which will ripen in June: this will be easily known by the pods changing brown, and opening. At that time the plants should be looked over three or four times a week, gathering each time such of the seed-vessels as are ripe; laying the seeds upon a paper to dry, and then putting them by until the season for sowing. As the plants which arise from seeds generally flower much better than offsets, those who would have these flowers in perfection should sow the seeds annually. These plants blow at the same time, and require nearly the same treatment, as Auriculas, both with respect to soil and situation; they are, however, more impatient of heat and drought, and more partial to shade and moisture. They may be set in the same sized pots and the same compost as the Auricula, only with the addition of more loam: or, they may be planted on cool shady beds or borders, being very hardy, and seldom perishing in the coldest and wettest seasons, because their parent is a native of this country: but without proper precautions they will be destroyed by the heat of the summer. This dislike of heat seems to indicate that the Polyanthus is a variety of the Primrose, which requires shade, and not of the Cowslip, which adorns our open pastures; though it is generally regarded as a variety of the latter. These plants are very subject to the depredations of snails and slugs in the spring of the year; hence the plants ought to be carefully examined every morning. Their worst enemy, however, is a small red spider, or *Acarus*, which in summer forms its web on the under side of the leaves. These little insects, scarcely visible without a magnifying glass, cause the leaves to become yellow and spotted, and essentially destroy the plant: they multiply rapidly, and will infest a large collection in a very short time. Such plants as appear infected should be immediately taken up, and soaked for two or three hours in a strong infusion of tobacco-water, and afterwards replanted in a fresh soil or compost, at a distance from their former situation. If the whole bed or border be infected, the plants must all undergo the same process and removal. The old bed or border should then lie fallow till the next season, or be planted with another crop not subject to such disasters. These plants may also be increased by slips or offsets taken off when they are fresh potted.—For further particulars, see the thirteenth species.

3. Primula Elatior; *Great Cowslip*, or *Oxlip*. Leaves toothed, wrinkled, contracted in the middle; scape many-flowered; border of the corolla flat. This is distinguished from the Primrose, by its many-flowered scape; and from the Cowslip, by the flat border of the corolla.—It is found in woods, thickets, hedges, and sometimes in pastures, but is by no means so common as the Primrose and Cowslip. It has been found in calcareous soils among the thickets and hedges of Cambridgeshire; on clayey pastures in Suffolk; in Headington-wick copse, Stow wood, and South Leigh, in Oxfordshire; common in some parts of Bedfordshire; near Hilland and Shillingley park, in Sussex; near Wray-house, adjoining to the river Rhodon in Essex; and on high pastures near Little Wenlock in Shropshire. It flowers in April and May. See the second species.

4. Primula Officinalis; *Common Cowslip*, or *Paigle*. Leaves toothed, wrinkled, contracted in the middle; scape many-flowered; border of the corolla concave. The root is like that of the Primrose, but smells more powerfully of Anise.—Plentiful in the meadows and pastures of England, and other parts of Europe, but only on a strong soil of clay or marl, flowering in April or May. The leaves are sometimes used as a pot-herb, and in salads; they are recommended for feeding silkworms, and may serve the same purpose as seedling Lettuces for the young worms before the Mulberry leaves make their appearance, as they only can afford the proper nourishment. The fragrant flowers make a pleasant wine, approaching in flavour to the Muscadel wines of the south of France, which is of a gentle narcotic quality, easing pain, promoting sweat, and gently disposing to sleep. The flowers, which are commonly supposed to possess a somniferous quality, have a roughish bitterish taste, which they impart with their agreeable odour and yellow tincture both to water and spirit. Vinous liquors impregnated with them, by maceration or fermentation, and strong infusions of them drank as tea, are supposed to be mildly corroborant, antispasmodic, and anodyne. An infusion of three pounds of the fresh flowers in five pints of boiling water, is made into a sirup of a fine yellow colour, agreeably impregnated with the flavour of the Cowslips. Hill observes, that the roots boiled in ale, are given by country people in vertigoes or giddiness of the head, with frequent and happy success; and the juice snuffed up the nose, either alone or mixed with vinegar, will many times give relief in the head-ach. Linneus having united the Primrose, Oxlip, and Cowslip, in one species, found no difficulty in naming it *Veris;* but for those who have since considered them as three species, it is not so easy. *Acaulis* may tend to mislead novices, and *Veris* is too general; hence the epithet *Vulgaris* is here applied to the Primrose, following Hudson, Withering, Relhan, and Smith. The name *Inodora* might have suited the Oxlip, if the flowers really had not their very grateful smell: and *Elatior* would suit better, compared with the Primrose, if the scape of the Cowslip were not the tallest of the three. This did not escape Shakspeare's eye, who, in his *Midsummer Night's Dream*, makes the Cowslip subservient to the Queen of the Fairies;

and, in allusion to Queen Elizabeth's institution of tall military courtiers called *pensioners*, says,

"The Cowslips all, her pensioners be."

The epithet Veris is improperly applied to the Cowslip, which flowers later than the Primrose. *Officinalis* is more proper, it having been most used in medicine.—For their culture, see the second species.

2. Primula Farinosa; *Bird's-eye Primrose.* Leaves oblong, toothletted, waved, mealy underneath; umbel erect, fastigiate; border of the corolla flat. Root perennial, somewhat præmorse, sweet-scented, and having numerous long perpendicular fibres.—This elegant plant is a native of many parts of Europe, especially the most northern; and also of Siberia: with us it is found in Yorkshire and Westmoreland, in wet or boggy pastures, or by the side of rills, flowering in July and August. The flowers are of a beautiful rose colour, varying with shades of purple, and they have been found entirely white. The plant varies also much in its size: it has been found by Mr. Curtis in a bog in Skirrith wood near Ingleton, a foot and half high; and in the cultivated plant he has observed a tendency to be viviparous, to produce one or more tufts of leaves among the flowers of the umbel. In its wild state it seeds readily, and frequently when cultivated. Towards the end of September the outer leaves fade, and the head of the plant forms itself into a knob or button, a kind of hybernacle; in the spring it extends, and the leaves then appear wholly white and mealy; the corolla continues to envelop the germen till it has almost arrived at maturity, forming a sort of calyptre to it. In habit this species approaches most nearly to *Androsace* and *Aretia:* in those genera, however, the tube of the corolla is oval, not cylindrical, and its orifice is more or less closed with glands; whereas in all the Primulas that part is open, and only slightly crenated. Nevertheless these three genera, and even *Cortusa*, might perhaps be united without any great violence to nature.—It is scarcely worth the pains to raise this plant from seed, since a strong root may be divided so as to form many plants; the best time for doing this is in the spring, soon after the leaves are expanded. Place each offset in a separate pot, filled with two parts of stiffish loam, and one part light sandy bog-earth; water and set them in the shade, under a north wall or paling, but not under trees; keep them there during summer in pans of water, but in the autumn, as the wet season comes on, take them out of the pans, and either lay the pots on their sides, or place them during the winter under a common Cucumber frame, to keep them from immoderate wet, which this plant cannot bear, although it be a native of boggy meadows. The next, if not the same year, these plants will blow strong, and thus they should be treated every year, for Primulas in general require to have their roots frequently parted.

6. Primula Longifolia; *Long-leaved Bird's-eye Primrose.* Leaves spatulate, toothletted, naked on both sides, after flowering elongated, almost erect; umbel erect, many-flowered. This bears a great affinity to the preceding, but the leaves differ in form, colour, and mode of growth; when fully grown, they are twice the length of those of the other: they are not mealy, the under side being as green as the upper; and they have a greater tendency to grow upright. The scape is shorter and thicker. The flowers form a similar umbel, but are smaller than the preceding, and less brilliant in colour. It flowers in May.—Native country unknown. It is a hardy plant, of ready growth, and will succeed either in the pot or border, by guarding it from the sun in summer, and from severe frost and too much wet in winter. It is increased by parting the roots either in September or at the beginning of March, and is very liable to be infested with aphides or plant-lice.

7. Primula Cortusoides; *Cortusa-leaved Primrose.* Leaves wrinkled, lobed; scape many-flowered. In the wrinkled appearance of its foliage this approaches to the Common Primrose; whilst in its inflorescence, the colour of its flowers, and solitary scape, which rises to an unusual height, it bears an affinity to the fifth species. In the winter it loses the leaves entirely, and forms a sort of bulbous hybernacle above ground, which circumstance should be generally known, as many are deceived thereby, and throw the plants away as if dead. The flowers are purple, and very handsome; they appear in June and July.—Native of Siberia. This being a rare plant, it must be carefully treated, as was directed for the last species. It may be raised from seeds, or increased by parting the roots; but is liable to be lost, without careful attendance.

8. Primula Villosa; *Mountain Primrose.* Leaves flat, serrulate, hirsute, or subvillose. This is a very valuable plant.—Native of the mountains of Carinthia and Switzerland, and common along the whole chain of the Alps from Monte Vesulo into Savoy, and thence to Switzerland. It may be treated in the same way as the three former sorts. See also the twelfth species.

9. Primula Nivalis; *Snow Primrose.* Leaves lanceolate, flat, sharply toothed, very smooth.—Native of the mountains of Dauria. See the twelfth species.

10. Primula Longiflora; *Long-flowered Primrose.* Leaves serrate, smooth; umbel nodding; tube of the corolla very long. It differs from the fifth species, in having the leaves less mealy, and less deeply toothed, the scapes higher, four flowers in the umbel, with the leaves of the involucre longer, the tube of the corolla three times as long, and the segments of the border narrower, and of a violet purple colour.—Native of the mountains of the Upper Valais, Tyrol, Carinthia, Carniola, Italy, and Croatia.

11. Primula Glutinosa; *Glutinous Primrose.* Leaves serrulate, smooth, glutinous; leaflets of the involucre very large.—Native of the higher Alps, bordering on the ice and snow in Upper Carinthia and the Tyrol.

12. Primula Marginata; *Silver-edged Primrose.* Leaves obovate, serrate, toothed, white-edged; scape many-flowered; leaflets of the involucre shorter than the peduncle. In its farinaceous tendency it resembles the next species, but is very unlike it in its wild state, the leaves being narrower, and the flowers larger and of a different colour. It is a delicate pretty plant, with a pleasing musky smell, and flowers of an uniform deep lilac, appearing in March and April.—To succeed in its cultivation, it will be necessary to place it in a pot of stiffish loam, mixed with one-third rotten leaves, bog-earth, or dung, and plunged in a north border, taking care that it does not suffer for want of water in dry seasons: when thus treated, it increases by its roots almost as readily as the Auriculæ, and may be propagated by parting them in April and September. The other alpine Primulæ may be treated in the same manner.

13. Primula Auricula; *Auricula*, or *Bear's Ear.* Leaves obovate, smooth, serrate; scape many-flowered, about the length of the leaves.—Native of the alps of Switzerland, Germany, Carniola, &c. This is the origin of all the fine powdered garden Auriculas: in its wild state the leaves are less powdery, the edges partially but often coarsely serrated, and their form broadly and obtusely obovate, of a lax, leathery, twisted habit; the flowers small and yellow, sometimes purple or red; their scent very agreeable.—To enumerate all the diversities of this plant produced by cultivation,

would be endless, for every year produces vast quantities of new flowers, differing continually in shape, size, and colour: in the leaves also there is great variety, so that the skilful florist can often distinguish the varieties by the leaves. It seldom happens, so capricious is fancy, that such flowers as are in great esteem one time, continue to be regarded a few years after, still finer or larger flowers being produced from seeds; and as the names convey little, and there are no descriptions of them, it would be useless to give a list, especially as the modern names are generally taken from some great personage, with the raiser's or florist's name prefixed. It will, however, be useful to the young florist to enumerate the indispensable qualities of a fine Auricula.—They are these: 1. The stem should be strong, upright, and of such a height as that the umbel of flowers may be above the foliage of the plant. 2. The peduncles or footstalks of the flowers should also be strong, and of a length proportioned to the size and quantity of the flowers, which should not be less than seven in number, that the umbel may be regular and close. 3. The tube, eye, and border, should be well proportioned; which they will be, if the diameter of the first be one part, of the eye three, and of the whole border about six parts. 4. The circumference of the border should be round, or nearly so, or at least not what is called starry. 5. The antheræ ought to be large, bold, and fill the tube well; and the tube should terminate rather above the eye, which should be very white, smooth, and round, without cracks, and distinct from the ground colour. 6. The ground colour should be bold and rich, and regular, whether it be in one uniform circle, or in bright patches; it should be distinct as the eye, and only broken at the outer part into the edging: a fine black, purple, or bright coffee-colour, contrast best with the white eye; a rich blue, or bright pink, is pleasing; but a glowing scarlet, or deep crimson, would be most desirable, if well edged with a bright green; this, however, can seldom be expected. The green edge is the principal cause of the variegated appearance in this flower; and it should be in proportion to the ground-colour, that is, about one half of each. The darker grounds are generally covered with a white powder, which seems necessary, as well as the white eye, to guard the flower from the scorching heat of the sun's rays. All flowers that are deficient in any of the above properties, are turned out into the borders of the garden, or rejected wholly, by every good florist, for, as there are varieties every year from seeds, the bad ones must make room for their betters; but in some persons, the passion for new flowers so much prevails, that supposing the old flower to be greatly preferable to a new one, the latter must take place, because it is of their own raising.—*Propagation and Culture.* In order to have good flowers from seeds, select the best flowers, which should be exposed to the open air, that they may have the benefit of showers, without which they rarely produce good seed. The time of their ripening, which is in June, may be easily known by the seed-vessel turning to a brown colour, and opening: care therefore must be taken, lest the seeds be scattered out of the vessel, for it will not be all fit to gather at the same time. The time for sowing is commonly in August, but any time before Christmas will be soon enough. The best soil is good fresh light sandy mould, mixed with very rotten cow-dung, or very rotten dung from the bottom of an old hot-bed. With this fill the pots, boxes, or baskets, in which the seeds are to be sown; and having levelled the surface very smooth, sow the seeds thereon, sifting over them a little rotten willow mould; then cover them with a net or wire, to prevent cats or birds from scratching out or burying the seeds, in which case they remain a year in the ground before the plants appear, if they ever appear at all. Many persons never cover the seeds, but leave them on the surface for the rain to wash them into the ground, which is often the best method. Let the boxes, &c. be so placed as to receive half the day's sun, during the winter season; but in the beginning of March, remove them where they may have only the morning sun till ten o'clock; for the young plants will now soon begin to appear, which, exposed to one whole day's sun only, will be all destroyed. They require water often in dry summer weather, but always in small quantities at each time. In July, the plants will be large enough to remove: a bed or boxes, of the above-mentioned soil, should then be prepared, and the plants set in it in squares of three inches. If a bed be preferred to boxes, they will require shading every day, till thoroughly rooted, and also in very hot dry weather; but if placed in baskets or boxes, they may easily be removed into a shady place. When the seedlings are planted in beds, there should be some rotten cow-dung laid about ten inches under the surface, and beaten down close and smooth; this will prevent the worms from drawing the young plants out of the earth, which they generally accomplish where this precaution is neglected. This dung should be laid about half a foot thick, which will entirely prevent the worms getting through it, until the plants are well established in the beds; and the roots will strike down into the dung by the spring time, which will make their flowers stronger than usual: these beds should be exposed to the eastern, but screened from the southern sun. When all the plants are come up, and are thus removed out of their boxes or pots, level the earth gently again; for it often happens, that some of the seeds will lie in the ground two years before they appear, especially if they were covered too deep when sown, as already observed. In the following spring many of these flowers will shew; when such as have good properties may be selected, and each of them removed into a pot of the same prepared earth, and preserved until the next season, when it will be easy to judge more correctly of the quality of the flower. Those that produce plain-coloured or small flowers should be taken out and planted in borders in the out-parts of the garden, to make a show, or serve for nosegays, &c; the others, which do not produce their flowers in the same year, may be taken up, and transplanted into a fresh bed, till they also can be examined.—The manner of propagating these flowers, when obtained, is from offsets or slips, taken from the old roots in April, when the flowers are in bloom: these offsets must be planted into small pots, filled with the same sort of earth as was before directed for the seedlings, and during the summer season should be set in a shady place, and must be often, but very gently, refreshed with water, but in the autumn and winter should be sheltered from violent rains. The spring following, these young plants will produce flowers, though but weak. Soon after they are past flowering, put them into larger pots, and the second year they will blow in perfection. In order to ensure a fine bloom of these flowers, the florist must observe the following directions: First, preserve the plants from too much wet in winter, which often rots and spoils them, but let them have as much free air as possible; nor should they be too much exposed to the sun, which is apt to forward their budding for flower too soon; and then the frosty mornings, which often occur in March, destroy their buds when unprotected. To prevent this, those who are very curious in these flowers, place their pots, in autumn, under a common hot-bed frame, where, in good weather, the plants may enjoy the full air, by drawing off the glasses; and in great rains, snow, or frost, the plants may be screened by covering them. Where this method is practised

with judgment, the flowers will be much stronger, and the plants will increase faster than when they are exposed abroad. Secondly, in the beginning of February, if the weather be mild, take off the upper part of the earth in the pots, as low as can be done without disturbing the roots, and fill them up with fresh rich earth; which will greatly strengthen them for bloom. Prepare the offsets also for transplanting in April, by causing them to push out new roots. Those plants which have strong single heads, always produce the largest cluster of flowers. On this account, therefore, the curious florists pull off the offsets, as soon as it can be done with safety to their growing, to encourage the mother plants to flower the stronger; they also pinch off the flowers in autumn, where they are produced, and suffer them not to open, lest their opening should weaken the plants. Thirdly, the pots must be covered with mats in frosty weather, during the time of their budding for flower, otherwise the sharp mornings would blight them, and prevent their blowing. Fourthly, when the flower-stems begin to advance, and the blossom-buds grow turgid, protect them from hasty rains, which would wash off their white mealy farina, and greatly deface the beauty of their flowers; at the same time keep them as much uncovered as possible, otherwise their stems will be drawn up too weak to support their flowers, which is often the case when the pots are placed near walls. Let them have gentle waterings to strengthen them, but suffer none of it to fall into the centre of the plant among the leaves. Fifthly, when the flowers begin to open, remove their pots upon a stage built with rows of shelves one above another, and covered on the top to preserve them from wet. This stage should be open to the morning sun, but sheltered from his beams in the middle of the day. In this position they will appear to much greater advantage than when the pots stand upon the ground; for, their flowers being low, their beauty is hid from us; whereas, when they are advanced upon shelves, we see them in a full view. In this situation they may remain till the beauty of their flowers is past, when they must be set abroad to receive the rains and imbibe fresh air, that they may produce seeds, which fail when they are kept too long under shelter. When the seed is ripe, gather it as soon as perfectly dry, and expose it to the sun in a window upon papers, to prevent its growing mouldy, suffering it to remain in the pods until the sowing season.—Those who are particularly nice in raising these flowers, direct the compost to be made one-half of rotten cow-dung, two years old; one-sixth fresh sound earth, of an open texture; one-eighth earth of rotten leaves; one-twelfth coarse sea or river sand; one twenty-fourth soft decayed willow-wood: the same quantity each, of peaty or moory earth and burnt vegetables, to be spread upon the surface of the other ingredients. This compost is to be exposed to the sun and air, turned once or twice over, and passed as often through a coarse skreen or sieve; then it should be laid in regular heaps from fifteen to eighteen inches thick, and in this state remain a year, turning it over two or three times, and keeping it free from weeds. The pots, into which these plants are put, ought to be hard baked: the inner diameter of the top should be six inches and a half, of the bottom four inches, and they should be about seven inches deep for common-sized blooming plants. Smaller plants and offsets should have smaller and shallower pots, while very large ones require their pots to be proportionably larger. The bottom of each pot ought to be slightly concave, and the hole half an inch in diameter. The rims should project about half an inch, in order to take up and remove them with greater ease and safety. The pots should be buried in wet earth, or immersed in water, three or four days or a week before they are wanted, to remove their absorbency. In the after-management of Auriculas, transplant or pot these flowers annually soon after their bloom, curtailing their fibres, if grown very long; and cutting off the lower part of the main root, if too long or decayed. The offsets at this season strike freely, and become well established before winter. Examine the plant carefully, and wherever any unsoundness appears, cut it entirely out with a sharp penknife; then expose the wounded part to the sun, and, when it is quite dry, apply a cement of bees-wax and pitch in equal quantities, softened in the sun or before a fire. If the lower leaves be yellow or dried up, strip them off in a direction downwards. Having put the hollow shell of an oyster over the hole of the pot, fill three parts of it with compost, highest in the middle; place the plant there, with its fibres regularly distributed all round, then fill the pot with the compost, adding a little clean coarse sand close round the stem on the surface, and strike the bottom of the pots against the ground or table to settle the earth. The true depth to plant an Auricula, is within half an inch of the lowest leaves, because the most valuable fibres proceed from that part; and the offsets will be thereby encouraged to strike root sooner. When these have formed one or more fibres, of an inch or two in length, they may, by means of a piece of hard wood, or by the fingers, be separated with safety, and planted round the sides of a small pot filled with the same compost, till they are sufficiently grown to occupy each a separate pot: if a small hand-glass be placed over each pot, it will cause the fibres to grow more rapidly; but if it be long continued, it will draw up and weaken the plants. In the beginning of May, as soon as the operation of potting is finished, place them in an airy and shaded situation, but not under the drip of trees. Let them remain here till September or October, when they should be removed into shelter. In the first favourable weather in the next February, remove all the decayed leaves, and in the middle of that month earth them up, that is, take away the superficial mould of the pots about an inch deep, and put in fresh compost, with the addition of a little loam, to give it more tenacity. This will contribute greatly to the strength of the plants, and the vigour of their bloom; at the same time it will afford a favourable opportunity to separate such offsets as appear to have sufficient fibre to be taken off at this early season. The pots with these offsets should be placed in a frame, in a sheltered situation, till their roots are established. Though frost, unless it be very rigorous, will not destroy the plants, yet it will injure them, and perhaps spoil the bloom, especially early in the spring; they should therefore be covered with mats in a severe season. When any plant has more than one or two principal stems, it is advisable to pinch off the smallest and weakest, in order to render the blossoms of that which remains larger and more vigorous. When the flowers, technically called *pips*, become turgid, and begin to expand, select the plants from the rest; remove them to a calm shady corner, and suspend small hand-glasses over them. The stage for the pots to stand on, whilst in bloom, should have a northern aspect, and should consist of four or five rows of shelves, rising one above another. The roof ought to be altogether glass-frames. The tallest-blowing plants should be placed behind, and the shortest in front. They must be regularly watered two or three times every week during the bloom.—In raising the Auricula from seed, if the boxes in which the seed is sown be placed on the surface of a hot-bed, in a Cucumber or Melon frame, the seeds will begin to vegetate in three weeks. The earth must be kept moderately moist, by sprinkling it with a hard clothes-brush, dipped in water that has been softened and warmed

by standing in the sun. At the end of four or five weeks, when the young plants will be all come up, they must have, gradually, more air, and in a fortnight or three weeks the boxes should be taken out of the frame, and placed in a warm situation, though not too much exposed to the sun, till towards the end of April; when they may be removed to a cooler aspect, where they can receive the sun only till nine o'clock; and in May they should be placed in the most cool and airy part of the garden; still not neglecting to keep the earth moderately moist, and to protect them from violent rains. As soon as any of the plants shew six leaves, transplant them into other boxes, an inch and half or two inches asunder; and when they are grown so as to touch each other, transplant them a second time, into larger boxes, at the distance of three or four inches, or into small pots, where they may remain till they blow, when the very good ones should be marked, and the bad destroyed. As soon as the bloom is over, let those that are marked be planted separately in pots, and taken care of till they blow again, when their merits may be more accurately ascertained. A great proportion of these seedlings will be plain-coloured, technically *self*, and of no value but as common border flowers, unless they have good properties in other respects, or are singularly beautiful or brilliant in their colours.

14. Primula Gigantea; *Tall Primrose.* Leaves rhomb-ovate, serrate, smooth; stem few-flowered, very tall.—It varies with the stem only eighteen inches high, and is a native of Siberia.

15. Primula Minima; *Dwarf Primrose.* Leaves quite smooth and shining, wedge-shaped, sharply serrate at the top only; scape few-flowered, (one or two flowered.) Root round, white within, blackish without, putting out very long whitish fibres horizontally, forming very large thick tufts, loaded with abundance of flowers; corolla purple, according to Kroeher and Jacquin. Willdenow observes, that it dyes of a violet colour. It flowers from June to September.—Native of Mount St. Gothard, Schneeberg, and other mountains of Austria.

16. Primula Integrifolia; *Entire-leaved Primrose.* Leaves quite entire, elliptic, suberenate, cartilaginous at the edges; umbel erect; calices with long tubes and very blunt. This in habit and stature generally resembles the thirteenth species. It is distinguished from the next species, by having the leaves cartilaginous at the edge, scarce apparently crenulate or ciliate when examined with a magnifier, and the calix tubular. In gardens, where it flourishes very well, it flowers in April and May.—Native of the Swiss, Pyrenean, Austrian, Styrian, and Carniolian mountains.

17. Primula Carniolica; *Carniolian Primrose.* Leaves quite entire, elliptic; umbel erect; calices acute, very short.—Native of Carniola.

18. Primula Sinmarchica; *Norwegian Primrose.* Leaves quite entire, ovate, on long petioles; umbel few-flowered, erect; corolla funnel-form.—Native of the mountains of Norway.

19. Primula Viscosa; *Viscid Primrose.* Leaves ovate, quite entire, villose, viscid; umbel erect; corollas salver-form. Root thick, at first dusky, then white, filiform; flowers pale blue.—Native of the mountains of Piedmont, on rocks about the baths of Valderia.

20. Primula Sibirica; *Siberian Primrose.* Leaves quite entire, ovate, on long petioles; umbel few-flowered, nodding; corolla salver-form.—Native of Siberia, in moist meadows, from the river Obo to beyond Lake Baikal.

21. Primula Mistassinica. Plant glabrous; leaves oval-spatulate, subdentate; scape elongated; umbels with few flowers; limb of the corolla reflex; segments cuneate-oblong, obtusely bifid; capsules oblong.—Grows on Lake Mistassins, or in Hudson's Bay. This is the only North American species noticed by Pursh.

Prince's Feather. See *Amaranthus Hypochondriacus.*

Prinos; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, half six-cleft, flat, very small, permanent. *Corolla:* one-petalled, wheel-shaped; tube none; border six-parted, flat; segments ovate. *Stamina:* filamenta six, awl-shaped, erect, shorter than the corolla; antheræ oblong, blunt. *Pistil:* germen ovate, ending in a style shorter than the stamina, and an obtuse stigma. *Pericarp:* berry roundish, six-celled, much larger than the calix. *Seeds:* solitary, bony, obtuse, convex on one side, angular on the other. *Observe.* It differs from *Ilex*, chiefly in the number. Sometimes it excludes one-sixth part in the fructification. Essential Character. *Calix:* six-cleft. *Corolla:* one-petalled, wheel-shaped. *Berry:* six-seeded.——The species are,

1. Prinos Verticillata; *Deciduous Winter Berry.* Leaves lanceolate, ovate, pubescent underneath, serrate on the whole margin; pedunceles many-flowered. It rises with a shrubby stalk to the height of eight or ten feet, sending out many branches from the sides the whole length; leaves alternate, on short stalks, about three inches long, and one broad; flowers solitary, or two or three together at the base of the leaf-stalks, small, white; berries red or crimson, at length purple, larger than those of the Holly. It flowers in July, and the seeds ripen in the winter. Native of Virginia.—This, and the next, are propagated by seeds, sown soon after they are ripe, upon a bed of light earth, covering them about half an inch with the same sort of earth. The seeds which are so soon put into the ground, will many of them come up the following spring; whereas, those which are kept longer out of the ground, will remain a whole year before the plants will appear, in the same manner as the Holly, Hawthorn, and some others. When the young plants come up, they may be treated in the same manner as has been directed for the American Hawthorns, these being full as hardy; but they delight in a moist soil, and a shady situation. In hot land they make little progress, and rarely produce any fruit.

2. Prinos Glabra; *Evergreen Winter Berry.* Leaves lanceolate, bluntish, smooth on both sides, serrate at the tip. It is not so tall as the preceding; the leaves also are shorter, and serrate at their points only. Berries round, purplish, or black, solitary, on long stalks, called *ink-berries* in Jersey.—Native of Canada.

3. Prinos Lucida. Leaves elliptic, acuminate, even, subserrate at the tip. It flowers in July.—This is the *Ilex Canadensis* of Michaux.

4. Prinos Dioicus; *Diœcious Winter Berry.* Leaves oblong-ovate, subserrate, smooth, coriaceous; peduncles axillary, one or three flowered; flowers diœcious, tetrandrous.—Found in the island of Montserrat.

5. Prinos Nitidus; *Shining Winter Berry.* Leaves oblong-ovate, serrate, shining, membranaceous; peduncles axillary, one-flowered; flowers tetrandrous. It is allied to the preceding, but differs in having slenderer branches, brown, not whitish.—Found in Montserrat.

6. Prinos Montana. Leaves ovate, serrate, shining on both sides; trunk twenty or thirty feet high, with an even brown bark; branches subdivided, almost upright, round, smooth.—Native of Jamaica, on coppices in the highest mountains.

7. Prinos Sideroxyloides. Leaves roundish, quite entire. The wood of this tree is hard.—Native of the Caribbee Islands, St. Christopher's, and Montserrat.

8. Prinos Ambiguus. Leaves deciduous, oval, acuminate

on both sides, mucronate-serrulate, pubescent. The flowers are from four to five cleft, white; the male flowers crowded together at the bottom of the branchlets; the female ones solitary. Berries red, larger than those of the Prinos Verticillatus.—Grows in sandy wet woods, and on the borders of swamps, from New Jersey to Carolina.

9. Prinos Lævigatus. Leaves deciduous, lanceolate, adpresso-serrate, acuminate, glabrous on both sides, shining on the upper side; female flowers axillary, solitary, subsessile; male flowers scattered; both male and female flowers six-cleft; berries large, dark red.—Grows on the Allegany Mountains from New York to Virginia; flowering in July.

10. Prinos Lanceolatus. Leaves deciduous, lanceolate, very slightly and remotely serrulate, acute on both sides, glabrous on both sides; female flowers scattered, pedunculated, six-cleft; male flowers aggregate, triandrous; berries small, scarlet.—Grows in the lower countries of Carolina and Georgia; flowering in June.

11. Prinos Coriaceus. Leaves evergreen, cuneate-lanceolate, coriaceous, glabrous, shining, very entire; corymbs axillary, very short, sessile, many-flowered; flowers six-cleft. There are two varieties, one with obovate-lanceolate and acuminated leaves; the other with lanceolate-acute leaves. This is a handsome tall shrub, of the appearance of Ilex Dahoon: and grows in the sandy woods of Georgia, near the banks of rivers; flowering in June and July.

Privet. See *Ligustrum Vulgare.*

Prockia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth three-leaved; (occasionally with two very small leaflets at the base.) *Corolla:* none. *Stamina:* filamenta numerous, capillary, the length of the calix; antheræ roundish. *Pistil:* germen roundish, slightly five-sided; style filiform, the length of the stamina; stigma purplish. *Pericarp:* berry five-angled. *Seeds:* very many. Essential Character. *Calix:* three-leaved, besides sometimes two leaflets at the base. *Corolla:* none. *Berry:* five-cornered, many-seeded.——There are eight species, chiefly natives of the Mauritius and the isle of Bourbon; only one of which we shall describe:

1. Prockia Crucis. Leaves heart-shaped, ovate, toothed; flower stalks terminal, somewhat racemose. A round branched shrub, the whole of which is smooth, and the bark of the branches purplish.—Native of the island of Santa Cruz.

Proserpinaca; a genus of the class Triandria, order Trigynia.—Generic Character. *Calix:* perianth three-parted, superior; leaflets erect, acuminate, permanent. *Corolla:* none. *Stamina:* filamenta three, awl-shaped, spreading, the length of the calix; antheræ twin, oblong, acute. *Pistil:* germen inferior, three-sided, very large; style none; stigmas three, pubescent, thickish, the length of the stamina. *Pericarp:* drupe small, juiceless, ovate, three-sided, three-winged, crowned with the permanent closed calix. *Seed:* nut somewhat bony, three-sided, three-celled; kernels oblong, fastened by a thread. Essential Character. *Calix:* three-parted, superior. *Corolla:* none. *Drupe:* with a three-celled nut.——The species are,

1. Proserpinaca Palustris. Root annual, creeping; stems a foot high, roundish; leaves alternate, lanceolate, serrate, ending in petioles; the lower, or those that are under water, pinnatifid, with linear segments; flowers axillary, solitary.—Native of the marshes of Virginia, North America.

2. Proserpinaca Pectinata. All the leaves pectinate-pinnatifid. This specific description sufficiently distinguishes it from the preceding plant.—It is found in overflowed places and ditches from New Jersey to Carolina, and flowers in July and August.

Prosopis; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, hemispherical, slightly four or five toothed. *Corolla:* petals five, lanceolate, sessile, equal. *Stamina:* filamenta ten, filiform, equal; antheræ incumbent, grooved, versatile. *Pistil:* germen oblong; style filiform, the length of the petals; stigma simple. *Pericarp:* legume oblong, linear, roundish, attenuated at both ends, jointed, smooth, pendulous. *Seeds:* many, rounded, oblong, coloured, immersed in a mealy substance. Essential Character. *Calix:* bell-shaped, four or five toothed. *Stigma:* simple. *Legume:* linear, many-seeded. ——The only species discovered is,

1. Prosopis Spicigera. This grows to a large tree, with a tolerably erect trunk; a deeply cracked ash-coloured bark; and irregular numerous branches, forming a globular shady head.—It is a native of most parts of the Coromandel coast; flowering during the cold and at the beginning of the hot season. The pod of this tree is the only part used; it is about an inch in circumference, and from six to twelve inches long: when ripe, it is brown, smooth, and contains, besides the seeds, a large quantity of a brown mealy substance, which has a sweetish agreeable taste like the Spanish Algaraba, or Locust Tree, *Ceratonia Siliqua.*

Protea; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth common usually imbricate; scales permanent, various in form and proportion; perianth proper none. *Corolla:* universal uniform; proper one, two, or four petalled, with the petals different in figure. *Stamina:* filamenta four, inserted into the petals below the tip; antheræ linear. *Pistil:* germen superior, awl-shaped, or roundish; style filiform; stigma simple. *Pericarp:* none; calix unchanged. *Seeds:* solitary, roundish. *Receptacle:* commonly naked, or villose, or chaffy. *Observe.* The species of this genus differ very much from each other in all the parts of fructification, but agree in the essential character of the stamina, inserted below the tip of the corolla. Essential Character. *Corolla:* four-cleft, or four-petalled. *Antheræ:* linear, inserted into the petals below the tip. *Calix:* proper none. *Nut:* one-seeded, superior.—The habit of the whole genus is shrubby; the height very various: some few are almost stemless: the leaves entire, coriaceous. As they all, except two, come from the same country, the following directions are generally sufficient for their propagation and culture. The warmth of a common green-house is generally sufficient for their protection; but many of them are delicate with respect to damp, and are apt to suffer if too much crowded, or over-watered, or placed in a damp part of the house. In summer they may be placed in the open air in a sheltered situation, for if exposed to winds the plants will be torn and rendered unsightly, nor will they make any progress in their growth. In warm weather they must be frequently but sparingly watered, and have but seldom any in cold weather. Several of them have not flowered in this country, and many do not perfect their seeds. Such therefore can only be increased by cuttings, and some are very difficult to increase in this way. The cuttings should be taken off in April just before the plants begin to shoot. Plant them in small pots, filled with light earth, place them from the sun, and refresh them with water gently and sparingly. About Midsummer, by which time they will have put out roots, shake them gently out of the pots, plant each in a separate small pot filled with light earth, place them in a frame, and there shade them until they have taken root, afterwards gradually inuring them to the open air, and treating them like the old plants. They are ornamental among other potted plants.——The species are,

* Pinnate: *with pinnate filiform Leaves.*

1. Protea Decumbens; *Decumbent Protea.* Leaves trifid, filiform; stem decumbent; corolla silky.—Native of the Cape.

2. Protea Florida. Leaves trifid, filiform; stem erect; heads solitary, encompassed with bractes.—Native of the Cape.

3. Protea Cyanoides. Leaves trifid-pinnate, filiform; stem erect; heads solitary, naked.—Native of the Cape.

4. Protea Patula. Leaves trifid-pinnate, filiform; stem erect; heads aggregate.—Native of the Cape.

5. Protea Pulchella. Leaves bipinnate, smooth, filiform; heads terminating, club-shaped, aggregate, leafless, bracted.—Native of New Holland.

6. Protea Sphærocephala. Leaves bipinnate, filiform; pedunncles shorter than the heads; calicine scales ovate, villose at the base.—Native of the Cape.

7. Protea Serraria; *Cut-leaved Protea.* Leaves bipinnate, filiform, rough-haired; peduncles longer than the heads, calicine scales ovate, lanceolate, rough-haired.—Native of the Cape.

8. Protea Trinerva. Leaves bipinnate, filiform, smooth; peduncles longer than the heads; calicine scales ovate, lanceolate, rough-haired.—Native of the Cape.

9. Protea Glomerata. Leaves bipinnate, filiform; common peduncle elongated, naked; pedicels longer than the heads.—Native of the Cape.

10. Protea Phylicoides. Leaves bipinnate, filiform; heads terminating, solitary, woolly.—Native of the Cape.

11. Protea Lagopus. Leaves aggregate, filiform; heads in spikes, aggregate.—Native of the Cape.

12. Protea Spicata; *Spiked Protea.* Leaves bipinnate, filiform; heads in spikes, distinct.—Native of the Cape.

13. Protea Sceptrum. Lower leaves bipinnate; upper trifid and entire.—Native of the Cape.

** Toothed: *with toothed callous Leaves.*

14. Protea Crinita. Leaves five-toothed, smooth; stem erect; heads two or three, terminating.—Native of the Cape.

15. Protea Conocarpa; *Tooth-leaved Protea.* Leaves five-toothed, smooth; stem erect; head terminating.—Native of the Cape.

16. Protea Elliptica. Leaves elliptic, three-toothed, smooth; stem erect; head terminating.—Native of the Cape.

17. Protea Hypophylla. Leaves three-toothed, smooth, divided one way; stem decumbent; head terminating.—Native of the Cape.

18. Protea Cucullata. Leaves three-toothed, smooth; heads lateral.—Native of the Cape.

19. Protea Tomentosa. Leaves three-toothed, tomentose.—Native of the Cape.

20. Protea Heterophylla. Leaves three-toothed and entire; stem decumbent.—Native of the Cape.

*** Acerose: *with filiform awl-shaped Leaves.*

21. Protea Pinifolia; *Pine-leaved Protea.* Leaves filiform; flowers in racemes, not calicled, smooth.—Native of the Cape.

22. Protea Racemosa; *Downy-flowered Protea.* Leaves filiform; flowers in racemes, calicled, tomentose. This is the only plant of the genus hitherto known with a one-flowered calix, which distinguishes it from the two following species, which at first sight it very much resembles.—Native of the Cape.

23. Protea Incurva. Leaves filiform, incurved, smooth; heads raceme spiked, tomentose.—Native of the Cape.

24. Protea Caudata. Leaves filiform, rough-haired; heads subsessile, in spikes.—Native of the Cape.

25. Protea Bracteata. Leaves filiform, channelled; head terminating; bractes multifid.—Native of the Cape.

26. Protea Comosa. Lower leaves filiform, upper lanceolate; head terminating.—Native of the Cape.

27. Protea Purpurea. Leaves linear, recurved; heads terminating, drooping; stem decumbent.—Native of the Cape.

28. Protea Prolifera. Leaves awl-shaped, appressed; stem proliferous.—Native of the Cape.

29. Protea Corymbosa. Leaves linear subulate, appressed; branchlets in whorls, subfastigiate; stem proliferous.—Native of the Cape.

30. Protea Nana. Leaves linear, subulate; head terminating; calix coloured. This is always known by the resemblance its flowers bear to the Rose.—Native of the Cape.

31. Protea Lanata. Leaves three-sided, appressed; head terminating, woolly.—Native of the Cape.

**** Linear: *with linear Leaves.*

32. Protea Torta. Leaves linear, oblique, callous.—Native of the Cape.

33. Protea Alba. Leaves linear, silky, tomentose.—Natie of the Cape.

***** Lanceolate: *with elliptic and lanceolate Leaves.*

34. Protea Aulacea; *Widow-Wail-leaved Protea.* Leaves linear, spatulate, smooth; flowers in racemes, not calicled.—Native of the Cape.

35. Protea Umbellata; *Umbelled Protea.* Leaves linear-spatulate, smooth; heads terminating; bractes multifid.—Native of the Cape.

36. Protea Linearis; *Linear-leaved Protea.* Leaves linear, spatulate, smooth; heads terminating, tomentose.—Native of the Cape.

37. Protea Cinerea; *Gray Protea.* Leaves linear, wedge-shaped, silky; head terminating, silky.—Native of the Cape.

38. Protea Scolymus; *Small Smooth-leaved Protea.* Leaves lanceolate, acute, smooth; head terminating, round, smooth.—Native of the Cape.

39. Protea Abyssinica. Leaves lanceolate, attenuated at the base, blunt; head terminating, hemispherical. In the middle of a very hot day, the flowers unbend themselves more, the calix seems to expand, and the whole flower to turn itself towards the sun, in the same manner as the Sunflower. When the branch is cut, the flower dries almost instantaneously. Bruce saw it in Abyssinia, where it is a native, near Mount Lamalmon.

40. Protea Mellifera; *Honey-bearing Red-barked Protea.* Leaves lanceolate, elliptic, smooth; head terminating, oblong, smooth; tips of the corolla woolly; style smooth, simple at the summit. This has been long known in our gardens; and is distinguished by its very glutinous, rose-coloured, smooth calix: the branches are red and smooth; and the leaves slightly obovate or spatulate.—Native of the Cape.

41. Protea Repens; *Creeping Protea.* Leaves lanceolate, elliptic, smooth; head ovate, smooth; stem decumbent, very short.—Native of the Cape.

42. Protea Plumosa; *Feather-flowered Protea.* Leaves lanceolate, wedge-shaped, hoary; head terminating, oblong; petals smooth beneath, hairy, with very long hairs above.—Native of the Cape.

43. Protea Obliqua; *Oblique-leaved Protea.* Leaves linear, lanceolate, smooth, callous, oblique; head cauline, terminating.—Native of the Cape.

44. Protea Parviflora; *Small-flowered Protea.* Leaves elliptic, obtuse, callous, oblique; heads smooth at the ends of the branchlets.—Native of the Cape.

45. Protea Pallens; *Pale Protea.* Leaves lanceolate,

attenuated at the base, smooth, acute, callous; head terminating, involucred; involucre long, pale.—Native of the Cape.

46. Protea Conifera; *Cone-bearing Protea.* Leaves lanceolate, attenuated at the base, smooth, acute, callous; head terminating, involucred; involucre long, acute, concolor.—Native of the Cape. See the 52nd species.

47. Protea Levisanus; *Branching Protea.* Leaves obovate, bluntly acuminate, imbricate, smooth; stem hairy, the head having a blunt longer involucre.—Native of the Cape.

48. Protea Strobilina; *Obtuse-leaved Protea.* Leaves elliptic, oblong, retuse, callous, smooth; head terminating, smooth.—Native of the Cape.

49. Protea Imbricata; *Imbricate-leaved Protea.* Leaves lanceolate, smooth, striated, imbricate; head terminating.—Native of the Cape.

50. Protea Sericea; *Silky Protea.* Leaves lanceolate, silky; branches filiform; stem decumbent.—Native of the Cape.

51. Protea Saligna; *Willow-leaved Protea.* Leaves lanceolate, silky; stem shrubby; heads oblong, involucred.—Native of the Cape.

52. Protea Argentea; *Silvery Protea.* Leaves lanceolate, silvery-tomentose, ciliate; stem arboreous; heads globular. The shining silvery leaves of this plant make a fine appearance, when the plant is intermixed with other exotics. It flowers in August.—Native of the Cape. It should be placed in an airy dry glass-case protected from cold, with as much light as possible, and must have little water in winter. This, as well as the 46th species, rises easily from seeds, which must be procured from the Cape, where they naturally grow. The seeds will sometimes remain in the ground six or eight months, and at other times the plants will appear in six weeks; therefore the best way is to sow the seeds in small pots filled with soft sandy loam, and plunge them into a moderate hot-bed; and if the plants should not come up so soon as expected, the pots should remain in the shelter till the following spring, when, if the seeds remain sound, they will appear. The pots in which the seeds are sown should have but little wet, for moisture frequently causes them to rot. When they appear, they ought not to be too tenderly treated, nor on the other hand to have much water, but should during warm weather be exposed to the open air in a warm situation, and protected in winter from frost.

****** Oblong: *with oblong ovate Leaves.*

53. Protea Acaulis; *Stemless Protea.* Leaves oblong, smooth; head globular, smooth; stem decumbent, very short.—Native of the Cape.

54. Protea Myrtifolia; *Myrtle-leaved Protea.* Leaves oblong, smooth; heads terminating, aggregate.—Native of the Cape.

55. Protea Grandiflora; *Great-flowered Protea.* Leaves oblong, veined, smooth; head hemispherical, smooth; stem arboreous.—Native of the Cape.

56. Protea Glabra; *Smooth Protea.* Leaves oblong, veinless, smooth; head hemispherical, smooth; stem shrubby.—Native of the Cape.

57. Protea Speciosa; *Handsome Protea.* Leaves oblong, smooth; head oblong; calicine scales bearded at the tip. The stem forms a large shrub: the leaves are obtuse, three or four inches long, and about half as broad: the flowers are the size of a small artichoke, with rose-coloured scales, finely fringed with brown, and bearded with white.—Native of the Cape.

58. Protea Totta; *Upright Smooth Protea.* Leaves ovate, smooth, callous; head ovate; corollas cylindrical, rough-haired.—Native of the Cape.

59. Protea Hirta; *Hairy Protea.* Leaves ovate, smooth; flowers lateral.—Native of the Cape.

60. Protea Pubera; *Downy Protea.* Leaves ovate, tomentose; heads terminating, tomentose.—Native of the Cape.

61. Protea Divaricata; *Straddling-branched Protea.* Leaves ovate, rough-haired; heads terminating; branches divaricating.—Native of the Cape.

******* Rounded: *with roundish Leaves.*

62. Protea Spatulata; *Spatulate-leaved Protea.* Leaves spatulate, somewhat cowled, smooth.—Native of the Cape.

63. Protea Cynaroides; *Round-leaved Protea.* Leaves roundish, petioled, smooth.—Native of the Cape.

64. Protea Cordata; *Heart-leaved Protea.* Leaves cordate. It blossoms in the spring; and is remarkable for the situation of its dull-crimson rosaceous flowers, which grow out of the creeping stem near the root, the leafy branches rising high above them, in a zigzag nearly upright position: the leaves are red-edged, and of a very rigid coriaceous texture.—Native of the Cape.

Prunella; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, two-lipped, shorter than the throat, permanent; upper lip flat, wider, truncate, very slightly three-toothed; lower lip erect, narrower, acute, semibifid. *Corolla:* one-petalled, ringent; tube short, cylindrical; throat oblong; upper lip concave, entire, nodding; lower lip reflex, trifid, blunt; middle segment wider, emarginate, serrate. *Stamina:* filamenta four, awl-shaped, forked at top, two of them a little longer than the others; antheræ simple, inserted into the filamenta below the top, as it were on another branch. *Pistil:* germen four-parted; style filiform, with the stamina bending to the upper lip; stigma bifid. *Pericarp:* none; calix closed, containing the seeds. *Seeds:* four, subovate. *Observe.* The essence of this genus consists in the forked filamenta, as in *Crambe*, and the middle segment of its lower lip toothed, as in *Nepeta.* Essential Character. *Filamenta:* forked, with an anthera on one of the forks. *Stigma:* bifid.——The species are,

1. Prunella Vulgaris; *Common Self-heal.* All the leaves ovate-oblong, petioled. The whole plant is thinly set with hairs, which are upright and white. It varies much in size, and with laciniate leaves; also sometimes with a white flower. The variety called Great-flowered Self-heal differs from the common sort in having the stems lower, the leaves more tender, and the flowers double the size. They all put forth large showy blossoms of a fine purple colour.—The juice of Self-heal is drying and astringent; and while wound herbs were in esteem, this was justly reckoned one of the principal. Taken inwardly, it is good against purgings with sharp bloody stools, checks overflowings of the menses, and is a good medicine for the piles. An infusion of the dried herb sweetened with honey, is good for a sore throat, or ulcerated mouth. It flowers from June to August, in pastures and meadows all over Europe.—The seeds of this, and of all the other species, should be sown in the autumn soon after they are ripe; for when sown in the spring they seldom are seen till twelve months after, if they at all appear. Thin the plants where too close, and keep them clean from weeds. They thrive best on a moist soil, and in a shady situation, where they will live three or four years; but in rich land they seldom continue longer than two years. They may also be increased by parting the roots in autumn.

2. Prunella Laciniata; *Jagged-leaved Self-heal.* Leaves ovate-oblong, petioled, the four uppermost lanceolate,

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PULMONARIA VIRGINICA —

Virginian Lungwort.

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PRUNELLA VULGARIS —

Common Self-heal.

P. 409.

PRUNUS LUSITANICA —

Portugal Laurel.

D.W. Campbell sc.

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toothed. Root perennial; stems hard, small, and branched, from three to six inches in height, but in one variety creeping on the ground; flowers not larger than those of the common sort; but more commonly white or yellow than blue or purple.—Native of Germany, Austria, Switzerland, Dauphiny, Piedmont, in the lower mountains, in dry pastures, and by the side of cultivated grounds.

3. Prunella Hyssopifolia; *Hyssop-leaved Self-heal.* Leaves lanceolate, quite entire, sessile; stem erect. Flowers large, generally blue, but sometimes white. The erect stem is that which principally distinguishes it from the first species. It flowers from July to October.—Native of the south of France, about Montpellier.

Pruning of Trees.—There is no part of gardening of more general use than pruning, and yet it is not common to see fruit-trees skilfully managed. Almost every gardener will pretend to be a master of this business, though very few rightly understand it; because it is not to be learnt by rote, but requires a strict observation of the different manners of growth in the several sorts of fruit-trees, which must be differently treated, according as they are naturally disposed to produce their fruit. Some sorts produce it on the same year's wood, as Vines; others oftenest upon the former year's wood, as Peaches, Nectarines, &c. and others upon cursons or spurs, which are produced upon wood of three, four, or five, to fifteen or twenty years' old, as Pears, Plums, Cherries, &c. In order to ensure the right management of fruit-trees, there should always be provision made for a sufficient quantity or bearing wood in every part of the tree; and yet there should be no superfluous branches, which would exhaust its strength, and produce decay in a few years. The objects for which fruit-trees are pruned are, first, to preserve them longer in a vigorous bearing state; secondly, to render them more beautiful to the eye; and, thirdly, to cause the fruit to be larger and better tasted. 1. Then it preserves a tree longer in a healthy bearing state, for, by pruning off all superfluous branches, the root is not drawn upon by such as are useless, and which must finally be cut out. 2. By skilful pruning, a tree is rendered much more pleasing to the eye. We are no advocates for drawing a regular line along the wall, according to the shape into which the tree is to be reduced, and then cutting all the branches, strong or weak, exactly to the chalked line: the absurdity of that practice will soon appear to any one who observes the difference of the shooting of those branches in the next spring after their mutilation. All, therefore, that is meant by proposing to render a tree more beautiful by pruning is, that the branches should be all cut according to their several strengths, and nailed at equal distances, in proportion to the different sizes of their leaves and fruit, and that no part of the wall, so far as the trees are advanced, be left unfurnished with bearing wood. A tree well managed, though it does not represent any regular figure, yet will appear very beautiful to the eye, when thus dressed and nailed to the wall. 3. It is of great advantage to the fruit; for the cutting away all useless branches, and shortening all the bearing shoots according to the strength of the tree, will render it more capable to nourish those fruit and branches which are left remaining, so that the fruit will be much larger and better tasted. And this is the advantage which those trees against walls or espaliers have over such as are standards, and are permitted to grow as they are naturally inclined: for it is not their being trained either to a wall or espalier which renders their fruit so much better than standards, but because the roots have a less quantity of branches and fruit to nourish, which therefore will be larger and better tasted.—The reasons for pruning being thus distinctly stated, the next point is the methods of performing it; for which the reader is referred to the different kinds of operation under the various kinds of fruit-trees, and in the articles *Grafting* and *Inoculating*. In this place we shall merely add some important directions concerning the right management of fruit-trees. There are many persons who suppose, that if their fruit-trees are but kept up to the wall or espalier during the summer season, so as not to hang in very great disorder, and in winter to get a gardener to prune them, it is sufficient: but this is a mistake: for the greatest care ought to be employed about them in the spring, when the trees are in vigorous growth, which is the only proper season to procure a quantity of good wood in the different parts of the tree, and to displace all useless branches as soon as they are produced, that the vigour of the tree may supply such branches only as are designed to remain, which will render them strong, and more capable of producing good fruit. If all the branches were permitted to remain, the most vigorous would imbibe the greatest share of the sap, while the rest would be starved, and only produce blossoms and leaves: for it is impossible that any person, however well skilled in fruit-trees, can reduce them into any tolerable order by winter pruning only, if they have been wholly neglected in the spring. There are individuals who do not entirely neglect their trees during the summer season, as those before mentioned, but yet do little more good to them, by what they call summer pruning; for these persons neglect their trees at the proper season, which is in April and May, when their shoots are produced, and only about Midsummer go over them, nailing all their branches, except such as are produced fore-right from the wall, which they cut out, and at the same time often shorten most of the other branches. This is an entirely wrong practice, for those branches which are intended to bear in the succeeding year should not be shortened during the time of their growth, which will cause them to produce one or two lateral shoots from the eyes below the place where they were stopped. These shoots will draw much of the strength from the buds of the first shoot, whereby they are often flat, and do not produce their blossoms; and if those two lateral shoots are not entirely cut away at the winter pruning, they will prove injurious to the tree, as the shoots which they produce will be what the French gardeners call water-shoots, and if suffered to remain upon the tree until Midsummer, will, as already observed, rob the other branches of their support. Besides this, by shading the fruit all the spring season, when they are cut away, and the other branches fastened to the wall, the fruit, by being so suddenly exposed, will receive a very great check, which will cause their skins to become tough, and render their pulp less delicate. This remark applies principally to stone fruits and Grapes. Pears and Apples being much hardier, suffer not so much, though it is a great disadvantage to those also to be thus managed. It must be observed, that Peaches, Nectarines, Apricots, Cherries, and Plums, are always in the greatest vigour when they are the least maimed by the knife: for where these trees have undergone large amputations, they are very subject to gum and decay: so that it certainly is the most prudent method carefully to rub off all useless buds when they are first produced, and pinch others, where new shoots are wanted to supply the vacancies of the wall. By these precautions, the trees may be so ordered as to want but little of the knife in winter pruning; and the less of that the better. The management of Pears and Apples is much the same with these trees in summer, but in winter they must be very differently pruned; because, as Peaches and Necta-

rines generally produce their fruit upon the former year's wood, they must have their branches shortened according to their strength, in order to produce new shoots for the succeeding year: so Pears, Apples, Plums, and Cherries, on the contrary, producing their fruit upon cursons or spurs, which come out of the wood of five, six, or seven years old, should not be shortened, because that would cause those buds which were naturally disposed to form these cursons or spurs to produce wood-branches, so that the trees would be filled with wood without producing much fruit: and as it often happens that the blossom-buds are first produced at the extremity of the last year's shoot, by shortening their branches the blossoms are cut away; and that should always be carefully avoided. There are several authors who have written upon the subject of pruning in such a prolix manner, that it is impossible for a learner to understand their meaning. They have described the several sorts of branches which are produced on fruit-trees, under the heads of wood-branches, fruit-branches, irregular branches, false branches, and luxuriant branches; all of which they assert every person who pretends to pruning should distinguish well. Now all this consists merely in a parcel of words to amuse the reader; for if in the spring of each year proper care be taken to displace the useless branches, as above directed, there will no such things as are termed irregular, false, or luxuriant branches, remain for winter pruning. The following general hints for the pruning standard fruit-trees are far more useful than these artificial distinctions. First, never shorten the branches of these trees, except where they grow irregularly on one side of the tree, while the other side becomes comparatively bare of branches, or those that appear are very weak. In this case the branch should be shortened down as low as is necessary, in order to obtain more branches to fill up the hollow of the trees. This however is only applicable to Apple and Pear trees, which will produce shoots from wood of three, four, or more years old; whereas most sorts of stone-fruit will gum and decay after such amputations. I would not be understood, says Mr. Miller, to direct the reducing of these trees into an exact spherical figure, since there is nothing more detestable than to see a tree prevented from growing as it is naturally disposed, with its branches produced at proportionable distances according to the size of the tree, by endeavouring to make it exactly regular at its head, so crowded with small weak branches, as to prevent the air from passing between them. All that I intend by this stopping of luxuriant branches, is only when one or two such happen on a young tree, where they entirely draw all their sap from their weaker branches; then it is proper to use this method, before the roots are wholly exhausted. Whenever this occurs to stone-fruit, which suffers much more than the former sorts by cutting, the evil should be remedied by stopping or pinching those shoots in the spring, before they have obtained too much vigour, which would cause them to put out side-branches, and divert the sap from ascending too fast to the leading branch, as has been directed for wall trees; but this must be done with caution. You must also cut off all dead or decayed branches, which cause their heads to look very ragged, especially at the time when the leaves are upon the tree; these being destitute of them, have but a despicable appearance; besides, these will attract noxious particles from the air, which being injurious to the trees, the sooner they are cut out the better. In doing of this, you should observe to cut them close down to the place where they were produced, otherwise that part of the branch left will decay, and prove equally hurtful to the tree: for it seldom happens when a branch begins to decay, that it does not die quite down to the place where it was produced; and any part being permitted to remain long uncut, does often infect some of the other parts of the tree. If large branches are cut off, it will be very proper, after having smoothed the cut part exactly even with a knife or chisel, to put on a plaster of grafting clay, which will prevent the wet from soaking into the tree at the wounded part. All such branches as run across each other should also be cut out, for these not only occasion a confusion in the head of the tree, but, by lying over each other, rub off the bark by their motion, and very often occasion them to canker, to the great injury of the tree: and on old trees, especially Apple, there are often young vigorous shoots from the old branches near the trunk, which grow upright into the head of the trees. These therefore should be carefully cut out every year, lest, by being permitted to grow, they fill the tree too full of wood; which should always be guarded against, since it is impossible for such trees to produce so much good fruit as those, the branches of which growing at a farther distance, the sun and air freely pass between them.

Prunus; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, one-leafed, bell-shaped, five-cleft, deciduous; segments blunt, concave. *Corolla:* petals five, roundish, concave, large, spreading, inserted into the calix by claws. *Stamina:* filamenta twenty to thirty, awl-shaped, almost the length of the corolla, inserted into the calix; antheræ twin, short. *Pistil:* germen roundish; style filiform, the length of the stamina; stigma orbicular. *Pericarp:* drupe roundish. *Seed:* nut roundish, compressed, with sutures a little prominent. Essential Character. *Calix:* five-cleft, inferior. *Petals:* five. *Drupe:* with a nut, having the sutures prominent.—The species are,

1. Prunus Padus; *Common Bird Cherry Tree.* Flowers in pendulous racemes; leaves deciduous, biglandular at the base.—This shrub or small tree rises to the height of eight or ten feet, and if permitted to stand, will have a trunk of nine or ten inches in diameter; with round and smooth branches; leaves alternate, rather glaucous, smelling like Rue; clusters on the newest branches, pendent, composed of numerous snow-white blossoms; fruit oval, dark purple or black, bitter. The scent of the flowers is very strong and disagreeable to most persons. This tree is not only called Bird Cherry, but Fowl Cherry, Wild Cluster Cherry, and, in Scotland, Hagberry. Every part of this shrub, except the fruit, is highly poisonous. The fruit is nauseous, but, bruised and infused in wine or brandy, it gives them an agreeable flavour. A strong decoction of the bark is used by the poor Finlanders in the venereal disease. Mr. Broerland, in the *Stockholm Acts*, directs six ounces of the dry, or eight of the fresh bark, to be boiled away in eight pints of water to four. The dose of this decoction is four ounces, taken four times daily. It cures the slighter infections alone, and, combined with mercury, facilitates the cure in the severer stages of the disease. A decoction of the berries is sometimes given with success in the dysentery. The wood being smooth and tough, is made into handles for knives and whips. Birds are very fond of the nauseous berries, and hence several of its names.—Native of most parts of Europe, in woods and hedges; also in the northern and temperate parts of Russia, and throughout Siberia. It is common in the north of England, as about Ingleborough in Yorkshire; in woods by the river Tees; at Pendeford in Staffordshire; a few miles north of Manchester; in some parts of Norfolk, as about Watton and Dereham; in a lane between Temple mills and Epping Forest; and frequently

in woods in Scotland.—This and the next, with the twenty-ninth species, are easily propagated either by seeds or layers. Sow the seeds in the autumn upon a bed or border of good ground, in the same way as Cherry stones designed for stocks. Treat the plants also in the same manner, planting them out in a nursery, where they may stand two years to get strength; and then transplant them to the places where they are to remain. These are usually intermixed with other flowering trees and shrubs in ornamental plantations. For layers, the young shoots should be laid down in the autumn: these will have good roots in twelve months, when they may be separated from the old plants, and transplanted into a nursery for a year or two to get strength, and may then be removed to the places where they are to grow.

2. Prunus Rubra; *Cornish* or *Red Bird Cherry Tree.* Flowers in upright racemes; leaves deciduous, even, biglandular at the base. This has often been confounded with the preceding, but, when raised from seed, always retains a difference. The leaves are shorter, broader, and not so rough. The flowers grow in closer shorter spikes, standing more erect.—Its native place is doubtful. It is propagated like the preceding species.

3. Prunus Virginiana; *Common American Bird Cherry Tree.* Flowers in racemes; leaves decidunus, glandular at the base in front. This tree rises with a thick stem from ten to thirty feet high, dividing into many branches, which have a dark purple bark. The fruit is later than that of the preceding species; it is black when ripe, and is soon devoured by birds. The wood is beautifully veined with black and white, and will polish well: hence it is in considerable esteem for cabinet work. Linneus thought this to be the offspring of the Common Bird Cherry, but the warts on the branches are double the size.—Native of North America.

4. Prunus Canadensis; *Canadian Bird Cherry Tree.* Flowers in racemes; leaves deciduous, without glands, wide-lanceolate, wrinkled, pubescent on both sides.—Native of North America.

5. Prunus Caroliniana; *Evergreen Carolina Cherry Tree.* Flowers in racemes; leaves evergreen, oblong, lanceolate, serrate, without glands. It does not exceed the height of three feet in England. It flowers in May; and the leaves retain their lucid verdure all the year.—Native of South Carolina, from whence the seeds were sent by the name of Bastard Mahogany, from the colour of the wood. It should be planted in a warm situation, sheltered from severe frost whilst young: when it has acquired strength, it will thrive very well in the open ground in sheltered situations. It may be propagated in the same way as the eighth species, and the branches will take root if laid down.

6. Prunus Occidentalis; *West Indian Laurel.* Flowers in lateral racemes; leaves perennial, without glands, oblong, acuminate, entire, smooth on both sides.—Native of the West Indies.

7. Prunus Sphærocarpa; *Globe-fruited Laurel.* Flowers in axillary racemes; leaves evergreen, without glands, entire, shining; drupes roundish. Trunk covered with a gray smooth bark; wood very hard and white.—Native of Jamaica, &c.

8. Prunus Lusitanica; *Portugal Laurel.* Flowers in racemes; leaves evergreen, ovate-lanceolate, serrate, without glands. This rises with a strong tree-like stem to the height of twenty feet or more, sending out many branches, covered with a shining purplish bark on every side. It flowers in June, and the berries ripen in October; and will be devoured by birds, unless immediately gathered. It is one of the most beautiful evergreen shrubs which we have in our plantations, especially when planted in a loose moist soil. The branches with their purple bark, the shining evergreen leaves, and the long racemes of white flowers, altogether make a fine appearance. It seldom sustains any injury from the severest cold of our winters, although it was originally brought from Portugal, where it is called *Azoureiro;* hence there is not any shrub more worthy of propagation.—It will grow upon almost any soil, but best in a gentle loam, neither very wet nor remarkably dry; as in either of those cases the plants never appear in full beauty. It may be propagated and transplanted in the same way and at the same time as the next species, (which see.) If the cuttings be planted in the way as directed for the latter, they will take root very freely; or the young branches, if laid down in the autumn, will take root in one year, and may then be removed into a nursery, where they may grow a year or two to get strength, and after that may be transplanted to where they are to remain. But although both these methods are very expeditious, it would be better to raise them from the berries, especially where they are designed for tall standards: for the plants which are propagated by cuttings and layers, put out more lateral branches and become bushy, but are not so well inclined to grow upright as those which come from seeds: and as there are now numbers of these trees in our gardens producing abundance of these berries every year, if they be only guarded from birds till they are ripe, there will be a sufficient supply for their propagation.

9. Prunus Laurocerasus; *Common Laurel.* Flowers in racemes; leaves evergreen, biglandular at the back. This differs from the preceding species in having the twigs and petioles green, whereas in that they are of a reddish brown. The leaves of this are of a yellowish green colour, whereas the upper surface of the leaves in the Portugal Laurel is very dark. Laurel leaves have a bitter styptic taste, accompanied with a flavour resembling that of bitter almonds, or other kernels of the drupaceous fruits: the flowers also manifest a similar flavour. The powdered leaves excite sneezing, though not so strongly as tobacco. The kernel-like flavour which the fresh leaves impart being generally esteemed grateful, has caused them to be used for culinary purposes, as in custards, puddings, blancmange, &c. and as the proportion of this sapid matter of the leaf is commonly inconsiderable, probably little or no bad effect may be generally produced; but since the poisonous quality of these leaves has been long unquestionably proved, those who prepare viands for the public palate ought not to run the risk of poisoning their unwary customers. Many country people, says Meyrick, make a practice of boiling a few Laurel-leaves in the milk which they make their custards, puddings, &c. of, to which it communicates an agreeable flavour. But this practice, it is hoped, will be laid aside, when it is known they are of a very poisonous nature. A distilled water strongly impregnated with their flavour, given in the quantity of four ounces to a very large mastiff dog, in a few minutes brought on the most terrible convulsions, and in less than an hour put an end to his life. Dogs have likewise been killed by much smaller quantities of the distilled water, an infusion of the leaves, or their juice; and there are some instances of liquors flavoured with the leaves of this tree proving fatal to human subjects. Dr. Cullen observes, that the sedative property of this plant acts upon the nervous system, upon a different manner from Opium, and other narcotic substances, the primary action of which attacks the animal functions; for this poison does not occasion sleep, but produces local inflammation, and seems to act directly upon the vital powers.—This tree may be easily propagated by seeds, or by planting cuttings; the best time for the latter is in September, as soon as the

autumnal rains fall to moisten the ground; the cuttings must be the same year's shoots, and if they have a small part of the former year's wood to their bottom, they will more certainly succeed, and form better roots. These should be planted in a soft loamy soil, about six inches deep, pressing the earth close to them. If these are properly planted, and the ground be good, few of the cuttings will fail; and if they are kept clean from weeds the following summer, they will have made good shoots by the following autumn, when they may be transplanted into a nursery, where they may grow two years, to acquire strength, and should then be removed to the places where they are to remain. These plants were formerly kept in pots and tubs, and preserved in green-houses in winter; but afterwards they were planted against warm walls, to prevent them from being frequently injured by severe frost. After this, a fashion arose of training the plants into pyramids and globes, keeping them constantly sheared, by which the broad leaves were often cut in the middle, and the plants rendered very unsightly. Of late years they have been more properly disposed in gardens, by planting them to border woods, and the sides of wilderness quarters, for which purpose we have but few plants so well adapted, as it will grow under the drip of trees, in shade or sun; and the branches will spread to the ground, so as to form a thicket; and the leaves being large, and having a fine glossy green colour, they set off the woods and plantations in winter, when the other trees have cast their leaves, besides making a good contrast with the green of other trees in summer. They are sometimes injured in very severe winters, where they stand singly, and are much exposed; but where they grow in thickets, and are screened by other trees, they are seldom much hurt; for in those places it is only the young tender shoots which are injured, and there will be new shoots produced immediately below these, to supply their place, so that in one year the damage will be repaired. But whenever such severe winters happen, these trees should not be cut or pruned till after the following Midsummer; by which time it will appear what branches are dead, which may then be cut away, to the places where the new shoots are produced; for by hastily cutting these trees in the spring, the drying winds obtain free ingress to the branches, whereby the shoots suffer as much, if not more, than they have previously done by frost.—The best way to obtain good plants certainly is to propagate these trees from their berries. The trees thus raised, have a disposition to an upright growth; whereas almost all those which are raised from cuttings or layers incline more to an horizontal growth, and produce a greater number of lateral branches. Whoever wishes to propagate this tree from seed, must guard the berries from the birds, who will otherwise devour them before they are perfectly ripe, which is seldom before the latter end of September or the beginning of October, for they should hang until the outer pulp is quite black. They should be sown soon after they are gathered, for they frequently miscarry when kept out of the ground till spring; and there will be no hazard in sowing them in autumn, provided they are put in a dry soil: and if the winter should prove severe, the bed in which they are sown should be covered with rotten tan, straw, pease-haulm, or any light covering, to prevent the frost from penetrating the ground. The best way will be to sow the berries in rows at six inches distance, and one inch asunder in the rows. If drills be made about three inches deep, and the berries scattered in them, and the earth drawn over them, it will be a very good method. The following spring the plants will appear, when they should be kept clean from weeds: and if the season should prove dry, and they be duly watered, the plants will make sufficient progress to bear removal in the following autumn. They should at that time be carefully taken up, and planted in a nursery, placing them in rows at three feet asunder, and the plants at one foot distance in the rows. In this nursery they may remain two years, by which time they will be fit to transplant where they are designed to remain. Autumn is the best season for transplanting, as soon as the rain has prepared the ground for replanting; for although they often grow when removed in the spring, yet they never take so well, nor make such good progress, as when removed in the autumn, especially if the plants are taken from a light soil, which generally falls away from their roots: but if they be taken up with balls of earth to their roots, and removed only to a small distance, there will be no danger of transplanting them in the spring, provided it be done before they begin to shoot; for as they shoot very early, it is on that account the frequent cause of their total failure.—There are persons who have grafted the Laurel upon Cherry stocks, with design to enlarge the trees; yet they seldom make much progress, although they take very well upon each other, so that it is a mere matter of curiosity: and to those who delight in such experiments, we recommend the trial of the Laurel grafted upon the Cornish Cherry, rather than any other sort of stock, because the graft will unite better with this; besides, it is a regular tree, and grows large, so that it will be more likely to produce large trees. Hunter says, in propagating the Laurel from cuttings, the under leaves should be stripped off. The cuttings may be set thick. The weather should be rainy, or at least cloudy, when this work is done; and the beds should be under a north wall, or else well shaded. If the weather will permit the cuttings to be planted in August, they will then more certainly take root before winter; but they should remain undisturbed till the spring twelvemonth following, when they should be carefully taken out, and planted in the nursery.—To raise the Laurel from seeds, says Boutcher, in the beginning of winter, soon after they are ripe, sow them in a shady border of fresh loose mould, in beds three feet and a half broad, with alleys of eighteen inches, covering them an inch and a half or two inches deep. About the middle of April, if the weather be dry and not frosty, water them frequently in the mornings, and continue it in the evenings of the summer months. In the succeeding spring remove them to the nursery, in rows two feet asunder, and nine or ten inches in the row. In two years, if the ground be good, and they have been properly looked after, they will be fit for a final removal. The seed beeds may be hooped over, that they may be covered occasionally with mats when the frost is severe. When a large plantation of Laurel is intended, the work of transplanting may be done at any time during the winter, when the weather will permit, but October is the best season. The ground must be well worked and cleaned, and the trees planted in holes a yard asunder. Although they begin to touch, still let them remain unthinned two or three years longer, to draw one another up. Thin them sparingly at first, only taking out a weakly plant here and there, to make room for the vigorous shooting of the others: lest the cold entering the plantation too suddenly, should retard its growth, if not destroy it altogether. These trees have a pleasing effect when mixed with other evergreens, in forming of thickets, or to shut out the appearance of disagreeable objects; for the leaves being very large, make a good blind, and are equally useful for screening from winds: hence when planted between flowering shrubs they may be trained so as to fill up the vacancies in the middle of such plantations, and will answer the purpose of screening in the winter, and

shutting out the view through the shrubs in all seasons; there are also many other purposes to which it may be applied, so as to make it very useful and highly ornamental.

10. Prunus Elliptica. Flowers in racemes; leaves elliptic, serrate, smooth; stem arboreous.—This tree is said to have been introduced into Japan by the Portuguese, instead of the Olive.

11. Prunus Paniculata. Flowers in spreading panicles; leaves elliptic, serrate, smooth; stem arboreous, wholly smooth.—Native of Japan.

12. Prunus Mahaleb; *Perfumed Cherry Tree.* Flowers in terminating corymbs; leaves ovate. This is a low crooked tree; the fruit yields a bitter purple juice; the wood is red, very hard, and greatly esteemed by the French cabinet makers. It is often confounded with that of the first species, under the name of Sain Lucie Wood. The leaves and flowers afford a pleasant distilled water. It flowers in April and May.—Native of Germany, Switzerland, Austria, the south of France, Piedmont, Crim Tartary, and on all parts of Mount Caucasus. This is often propagated, by being grafted on any sort of Cherry-stock.

13. Prunus Armeniaca; *Apricock* or *Apricot Tree.* Flowers sessile; leaves subcordate. This fruit-tree is sufficiently distinguished by its broad roundish leaves, drawn to a point at the end, smooth, glandular at the base in front, where they are sometimes slightly cordate, and unequal, that is, one side longer than the other; the edge is finely serrate; the petiole is from half an inch to an inch in length, commonly tinged with red. Linneus remarks, that the vernant leaves are convoluted, that is, not folding flat together, like those of the Cherry, but rolling upwards more or less: the leaves of many Apricot-trees have at all times, in fact, a disposition to this convolution. The flowers are sessile, white, tinged with the same dusky red that appears on the petioles. The fruit is round, yellow within and without, firmer than Plums and most Peaches, enclosing a smooth compressed stone, resembling that of the Plum. This fruit is mentioned by Dioscorides, but it is not certain of what country it is a native; there is, however, no doubt that it came into Europe from some part of Asia, and, it is supposed, from Armenia. The following are the most excellent kinds: 1. The Masculine, is the first ripe of all the Apricots; it is a small roundish fruit, of a red colour towards the sun; as it ripens, the colour fades to a greenish-yellow on the other side: it has a very quick and high flavour. The tree is very often covered with flowers; but as they come out early in the spring, they are frequently destroyed by the cold, unless the trees be covered to protect them. 2. The Orange, is the next ripe; it is a much larger fruit than the former, and changes, as it ripens, to a deep yellow colour. The flesh being dry, and not high-flavoured, it is better for tarts and preserving, than for the dessert. 3. The Algiers, is the next in season; it is of an oval shape, a little compressed on the sides, and turns to a pale yellow or straw colour when ripe; the flesh is high-flavoured, and very full of juice. 4. The Roman, is the next ripe: this is a larger fruit than the former, and not compressed so much on the sides; the colour is deeper, and the flesh not so moist, as the former. 5. The Turkey Apricot, is still larger than any of the former, and of a globular figure. The skin turns to a deeper colour, and the flesh is firmer than either of the two last preceding sorts. 6. The Breda Apricot, so called, by being brought from Holland to England, came originally from Africa; it is a large roundish fruit, changing to a deep colour when ripe. The flesh is soft, full of juice, and of a deep orange colour inside; the stone is larger and rounder than in any of the other sorts. This is the best Apricot we have, and, when ripened on a standard, is preferred before all others. 7. The Brussels, is the latest ripe of all the Apricots: for though planted against a wall, it is generally the middle of August before it is ripe, unless it be planted to a full south aspect; which should not be done, because the fruit which grows in a warm exposure is never well tasted. This fruit is of a middling size, rather inclining to an oval figure, red on the side next the sun, with many dark spots, and of a greenish-yellow on the other side; the flesh is firm, and of a high flavour; the fruit often cracks before it is ripe. Most people prefer this to the former sort, except when that is planted as a standard; in which case the fruit is fuller of juice, and has a much richer flavour.—The industry of modern gardeners, and the love of novelty, occasion new varieties to be continually adding to our collection of fruits. Thus, among Apricots, the Masculine is subdivided into the Early White, and the Early Real: we also hear of the Temple Apricot, ripe in the middle of August; the Moor Park, Peach, Dunmore, or Anson, a large flat-shaped fruit, of a deep yellow colour, and very high-flavoured; to which might be added a host of others. There is a great variety of fruiting Apricots in China; and from the wild tree, the fruit of which has little pulp but a large kernel, they extract a great quantity of oil, superior to that produced from walnuts. The barren mountains to the west of Pekin are covered with these trees. They have also a variety of double-blossomed Apricot-trees, which they plant on little mounts in their gardens, and which have a beautiful effect in the spring. They have also dwarf trees, which are placed for ornament in their apartments, where they flower during the winter. The Chinese not only preserve the fruit both wet and dry, but make lozenges from the clarified juice, which, dissolved in water, leaves a cool refreshing beverage. It is worthy of remark, that the young shoots of this fruit-tree will dye wool of a fine golden cinnamon colour.

—*Propagation and Culture.* Most people train these trees up to stems of six or seven feet high, or bud them upon stocks of that height; but this is an injudicious practice, because the higher the heads of these trees are, the more they are exposed to the cutting winds in the spring, which too frequently destroy the blossoms; the fruit also is more liable to be blown down in summer, especially if there be high winds when it is ripe. By falling from a great height, the fruit must be bruised and spoiled: therefore half standards, of about thirty inches or three feet high in the stem, are preferable; or they may be planted as dwarfs, against an espalier, where, if skilfully managed, they will produce a large quantity of good fruit, and the trees in espalier may be more conveniently covered in the spring, when the season proves unfavourable, in which case there will be a greater certainty of fruit every year. Apricots are all propagated by budding them on Plum stocks, and will readily take upon almost any sort of Plum, provided the stock be free and thriving. The Brussels sort, however, is usually budded on a sort of stock commonly called the St. Julian, which suits this tree best, being generally planted for standards. The manner of raising the stocks, and budding these trees, will be found under their respective heads, our present subject being their planting and management. All of them, except the two last sorts, are planted against walls, and should have an east or west aspect; for if they are planted full south, the great heat causes them to be meally before they become eatable. The borders near these walls should be at least six or eight feet wide, and if more the better, but a depth of two feet, or at most thirty inches, is quite sufficient. If the ground be a wet cold loam or clay, the border should be raised as much above the level of the surface as it will admit, laying some stones or rubbish in the

bottom, to prevent the roots from running downwards; but if you plant upon a chalk or gravel, it will be better to raise the border to a proper thickness with good loamy earth, than to sink them by removing earth or gravel; for although these are removed the whole length of the border, which may be allowed to be eight feet, and this trench filled with good earth, yet the roots of the trees will in a few years extend this length, and then meeting with the chalk or gravel, they will receive a check, which will cause their leaves to fall off early in the season, and the fruit will be small, dry, and ill-flavoured, and the shoots of the trees will be weak. But where the borders are raised above either, to their full height, the roots will not strike down into the gravel or chalk, but rather extend themselves near the surface, where they will meet with better soil; and as the trees are of long duration, and old trees are not only more fruitful than young, but the fruit is also better flavoured, it is desirable to provide for their continuance. The best soil for these, and all other kinds of fruit-trees, is fresh untried earth, taken about ten inches deep from a pasture-ground with the turf, and laid to rot and mellow at least twelve months before it is used, mixing a little rotten dung with it; this must be often turned, to sweeten and imbibe the nitrous particles of the air. When the former soil of the border is taken away, this fresh earth should be carried into the place; and if the borders be filled with it two months before the trees are planted, the ground will be better settled, and not so liable to sink afterwards; and in filling the borders, it should be raised four or five inches above the intended level, to allow for the settling. The borders being thus prepared, select such trees as are only of one year's growth from their budding. If the soil be dry, or of a middling temper, October is the best season for planting, especially as there will at that time be a greater choice of trees from the nurseries, before they have been picked and drawn over by other people. The manner of preparing these trees for planting, is fully detailed under the article Peach Tree; see *Amygdalus*. At the time of planting, no part of the head of the trees should be cut off, unless there be any strong fore-right shoots which will not come to the wall, and therefore these should be taken quite away. The trees being prepared, mark out the distances at which they are to stand, which, in a good strong soil, or against a low wall, should be twenty feet or more, but in a moderate one eighteen feet is a good reasonable distance; then make a hole where each tree is to stand, and place its stem about four inches from the wall, inclining the head thereto; and after having fixed the tree in the ground, nail the branches to the wall to prevent their shaking, and cover the surface of the ground round the root with rotten dung, to keep out the frost; in this state let it remain till the end of February or the beginning of March, when, if the weather be fine, you must unnail the branches of your trees, so as not to disturb their roots; and being provided with a sharp knife, put your foot close to the stem of the tree, and placing your left hand to the bottom of it, to prevent its being raised with your right hand, cut off the head of the tree, if it has but one stem, or where it has two or more shoots, each of them must be shortened to about four or five eyes above the bud, so that the sloping side may be towards the wall. In the spring, if the weather proves dry, it will be necessary to give the trees a gentle refreshing with water; in the doing of which, if they be watered with a rose to the watering-pots all over their heads, it will greatly help them. Lay some turf or other mulch round their roots, to prevent their drying during summer; and in the spring, as new branches are produced, take care to nail them to the wall in a horizontal position, displacing all the foreright shoots. This must be repeated as often as necessary, to prevent their hanging from the wall; but by no means stop any of the shoots in summer. At Michaelmas, when the trees have done growing, their branches should be unnailed, and shortened in proportion to their strength: a vigorous branch may be left eight or nine inches long, but a weak one not above five or six. Many persons will perhaps be surprised at this direction, after their allowing such a distance between the trees, that the wall can never be filled; but this pruning shoot is quite necessary, in order to procure a further supply of lower branches, that every part of the wall may be occupied quite from the bottom; having particular attention to preserve nearly an equal number of branches arranging on each side of the tree, nailing them close to the wall horizontally, four, five, or six inches asunder. In the summer following, each horizontal branch will push out three, four, or more new shoots, of which if any rise fore-right and behind the branches, they should be rubbed off early in the season, nailing all the regular side-shoots at full length during the summer, so as that the middle of the tree may be kept open; and never shorten any of the shoots in summer, unless to furnish branches to fill vacant places on the wall; and never defer this later than the end of April, for the same reasons as are stated under the article *Amygdalus*. At Michaelmas shorten these shoots as was directed for the first year; the strong ones may be left nine or ten inches, and the weak not more than six or seven. The following year's management will be nearly the same, only observe that Apricots produce their blossom-buds not only upon the last year's wood, but also upon the cursons or spurs which are produced from the two-years' wood; a great care should therefore be had in the summer management, not to displace or injure these: observe also to shorten the branches at the winter pruning, so as to furnish fresh wood in every part of the tree; and be sure to cut out entirely all luxuriant branches, or displace them as soon as they are produced; which if left to grow, would exhaust the nourishment from the bearing branches, which cannot be too strong, provided they are kindly; for the more vigorous the tree is, the more likely it is to resist the injuries of the weather; though we have often seen trees brought to so weak a condition as only to be able to blow faintly, after which most of the bearing branches have died. This has been often attributed to blight, when it really arose from wrong management. The Brussels and Breda Apricots being for the most part planted for standards, will require very little pruning or management: only observe to take out all dead wood, or such branches as cross each other; this must be done early in autumn, or in the spring after the cold weather is past, that the part where the incision is made may not canker.

14. Prunus Sibirica; *Siberian Apricot Tree.* Flowers sessile; leaves ovate-oblong. This differs very little from the preceding species. It only attains the height of six feet, and is probably a mere variety arising from the difference of climate and situation.—Native of Transalpine Dauria, in the empire of Russia, where the north side of the mountains are in May covered with the purple flowers of Rhododendron Dauricum; and the south side, with the white and rose-coloured flowers of this dwarf tree.

15. Prunus Pumila; *Dwarf Canadian Cherry Tree.* Flowers subumbelled; leaves narrow, lanceolate. It rarely exceeds four feet high, and divides into many slender branches near the ground. The flowers come out two or three together at each joint, the whole length of the branches, on long slender pedunceles. It flowers in May. The fruit, which is

red and acid, ripens in July. Native of Canada.—This is easily propagated, by laying down the branches early in the spring: they will take root by the following autumn, when they may be taken off, and either planted in a nursery to get strength, or in the places where they are designed to remain. It may also be propagated by sowing the stones like the Cherry.

16. Prunus Cerasus; *Common* or *Cultivated Cherry Tree.* Umbels nearly sessile; leaves ovate-lanceolate, smooth, folded when young. The branches are ash-coloured, shining, roundish; leaves stalked, pointed, unequally serrated, veined; stipules toothed, glandular; umbels leafless, pendent, composed of but few blossoms, each on a long stalk; calix reflexed; fruit red, justly celebrated for its agreeable and acid flavour.—The Cherry differs from the Plum in having the stone nearly globular, with the kernel of the same shape. The gum that exudes from this tree is equal to Gum Arabic, and may be used for the same purposes, as in the strangury, heat of urine, &c. A garrison consisting of more than a hundred men were kept alive during a siege of two months, without any other food than this gum, a little of which they frequently took in their months, and suffered it to dissolve gradually. The kernels were formerly supposed to possess very great and singular efficacy in apoplexies, palsies, and nervous disorders in general; and a water distilled from them was long made use of as a remedy for those fits which young children are frequently troubled with. But since the poisonous qualities of Laurel water (another species of Cherry) have been discovered, it has been found that the water drawn from the kernels of Black Cherries, when made strong, is little less noxious; and there is every reason to believe that many hundreds of children have lost their lives by this unsuspected medicine. The wood is hard and tough, used by turners and chairmakers, who stain it to imitate mahogany. This tree is the original stock from which the cultivated sorts of Cherries are derived. Ray mentions the Common Wild Cherry with a red fruit; the Least Wild Heart Cherry Tree, in Lancashire, Cheshire, and Westmoreland; and the Wild Northern Cherry, with small late-ripe fruit, on the banks of the Tees, near Barnard Castle in Durham. The varieties of eatable Cherries are innumerable. Mr. Miller enumerates, 1. The Common or Kentish Cherry, from which, he says, it is supposed most of the varieties cultivated in the English gardens have been raised, though of this he confesses himself very doubtful; the differences in the size and shape of their leaves, and in the shoots of the trees, being very great. 2. The Early May Cherry, which is the first that becomes ripe, and should always be introduced where there is room. 3. The May Duke, the next ripe, a larger and more valuable fruit. 4. The Arch Duke, which succeeds the May Duke. This, if suffered to hang till it is quite ripe, is an excellent cherry. It should not be gathered before Midsummer, and may hang a fortnight longer, even near London, where it ripens a fortnight sooner than in places forty miles distant. This fruit may be continued till August against a north wall. 5. The Flemish. 6. The Red Heart. 7. The White Heart. 8. The Black Heart. 9. The Amber Heart. 10. The Ox Heart. 11. The Lukeward, which is a good bearer. The fruit also is good, of a dark colour, and will do well in standards. 12. The Carnation: this is valuable for its coming late: it is not the best bearer, though the fruit is firm and fleshy, and will ripen very well on espaliers. 13. The Hertfordshire Heart, a firm and well-flavoured fruit, but does not ripen earlier than the end of July or the beginning of August. 14. The Morello, which is generally planted against a north wall, and much used for preserving. In a warmer aspect, if the fruit be suffered to hang till ripe it will be very fit for the table: on a S. W. wall it will be perfectly ripe by the middle of August. 15. The Bleeding Heart. 16. The large Spanish Cherry, nearly allied to the Duke, of which it seems to be only a variety, and ripens soon after. 17. The Yellow Spanish Cherry; of an oval shape and an amber colour: it ripens late, is sweet, but not of a rich flavour, and is but a middling bearer. 18. The Double-flowered, which is propagated solely for ornament. —It is commonly asserted that Cherries were introduced into England in the time of Henry VIII.; but written evidence has been found, that before the middle of the 15th century the hawkers used to expose cherries for sale in the same manner as is now done early in the season. Lydgate, in the following couplet from his poem called *Lickpenny*, says,

> Hotpescode own (one) began to cry,
> Straberrys rype, and *Cherries* in the *ryse*.

That is, observes Mr. Warton, he cried, Hot, or (as others more properly think) *Hotspur* Peas, Ripe Strawberries, and Cherries on a bough or twig; *ryse*, *rice*, or *ris*, signifying a long branch, the very same word being to this day used in the west of England.—*Propagation and Culture.* All kinds of Cherry Trees are propagated by budding or grafting the several kinds into stocks of the Black or Wild Red Cherries, which are strong-shooters, and of longer duration than any of the garden kinds. The stones of the Wild Cherry trees are sown in a bed of light sandy earth in autumn, or are preserved in sand till spring, and then sowed. The young stocks should remain in the nursery beds till the second autumn after sowing; at which time prepare an open spot of good fresh earth well worked. In October, plant out the young stocks at three feet distance row from row, and about a foot asunder in the rows; being careful, in taking them up from their seed-beds, to loosen their roots well with a spade to prevent their breaking. Prune their roots; and if they are inclinable to root downwards, shorten the tap-root, but do not prune their tops. The second year after planting out, if they take to planting well, they will be fit to bud, if they are intended for dwarfs; but if for standards, they will not be tall enough till the fourth year, for they should be budded or grafted nearly six feet from the ground, otherwise the graft will not advance much in height; so that it will be impossible to obtain a good tree from such as are grafted low, unless the graft be trained upwards. The usual way with the nursery gardeners is to bud their stocks in summer, and such of them as miscarry they graft the succeeding spring. Those trees where the buds have taken, must be headed off about the beginning of March, about six inches above the bud; and when the bud has shot in summer, if there be any apprehension of its being blown out by the winds, it must be fastened with bass or other soft tying, to that part of the stock which was left above the buds. The autumn following these trees will be fit to remove; but if the ground be not ready to receive them, they may remain two years before they are transplanted; in doing which, observe not to head them, which is often immediate death; and if they even survive it, they seldom recover in less than five or six years. If these trees are intended for a wall, plant dwarfs between the standards; but the latter, as the former fill the walls, must be cut away to make room for them. Never plant standard Cherries over other fruits, for nothing will prosper under the drip of Cherry-trees. When they are taken up from the nursery, shorten the roots, and cut off all the bruised parts, as also all small fibres, which would dry, grow mouldy, and retard the growth of the new fibres in their coming forth; cut off likewise the dead part of the stock which was left

above the bud, close down to the back part of it, that the stock may be covered by the bud. If these trees be designed for a wall, place the bud directly from the wall, that the back part of the stock which is cut may be hidden. The sorts commonly planted against walls are, the Early May and May Duke, which require a south aspect. The Hearts and Common Duke will thrive on a west wall; and in order to continue the Duke later in the season, they are frequently placed against west and north-west walls, where they will succeed very well. The Morello is generally placed on a north wall. The Hearts are seldom planted against walls, not being good bearers, though probably that defect might be removed if they were grafted on the Bird Cherry, and properly managed. The Bird Cherry stock is said to render Cherries very fruitful, producing the same effect upon them as the Paradise stock does upon Apples: so that it is worth while to make the experiment. Some persons graft the Duke and other sorts of Cherries upon the Morello, which is but a weak shooter, in order to check the luxuriant growth of their trees, which will succeed for three or four years, but they are not of long duration, nor will they make shoots above six or eight inches long; being closely covered with blossoms, they may produce some fruit in a small compass: but such experiments cannot succeed for general use, and only serve to satisfy curiosity; and it is much better to allow the tree a greater share of room against the walls, when one tree so planted, and properly managed, will produce more fruit than twenty of these trees, or twice that number, when they are planted too close, though they are grafted upon the Black Cherry or any other free-stock. Cherry-trees standing against the wall should be at least twenty or twenty-four feet asunder, with a standard tree between each dwarf, for they will extend themselves as far or farther than Apricots, and many other sorts of fruit. In the orchards of Kent, the usual distance allowed for them is forty feet square, at which space they are less subject to blight than when they are planted closer; and the ground may be tilled between them almost as well as if it were entirely clear, especially whilst the trees are young; and the often stirring the ground, provided the roots be not disturbed, will greatly help the trees; but when they are grown so large as to overshadow the ground, the drip of their leaves will suffer nothing to live underneath. The best orchard sorts are, the Common Red or Kentish Cherry, the Duke, and the Lukeward; all of which are plentiful bearers.—In pruning these trees, the shoots should never be shortened, for most of them produce their fruit-buds at their extreme part, which by shortening are cut off, and occasions the death of the shoot: their branches should therefore be trained in at full length horizontally, observing in May, where there is a vacancy in the wall, to stop some strong adjoining branches, which will occasion their putting out two or more shoots; by which means at that season of the year there may always be a supply of wood for covering the wall; at the same time displace all fore-right shoots by the hand, for if suffered to grow till winter they will not only deprive the bearing branches of their proper supply of nourishment, but occasion the tree to gum when cut out: for no sort of fruit-tree bears the knife worse than Cherry. In displacing the fore-right shoots, take care not to rub off the sides or spurs which are produced upon the two or three years old wood; for it is upon these that the greatest part of the fruit is produced, and they will continue fruitful for several years. Ignorance or neglect of this caution renders Cherry trees, especially the Morello, so often unfruitful, for the more they are cut the weaker are their shoots. The soil that these trees thrive best in is a fresh hazel loam; if it be a dry gravel, they will not live many years, and will be perpetually blighted in the spring.—The Double-flowering Cherry is propagated by budding or grafting on the Black or Wild Cherry stock; and the trees are very proper to intermix with flowering trees of a second growth. The flowers are as large and double as a Cinnamon Rose, and being produced in large bunches on every part of the tree, render it one of the most beautiful trees of the spring. Some of the flowers which are less double often produce fruit, which is not the case with the double flowers.

17. Prunus Avium; *Small-fruited Cherry Tree.* Umbels sessile; leaves ovate-lanceolate, pubescent underneath, folded together.—This grows to be a large tree fit for timber, and is frequently found in woods. From this, the only varieties ever raised by seeds are, the Black Coroun and the Small Wild Cherry, of which there are two or three varieties, differing in the size and colour of their fruit. The first sort is much cultivated in the Chiltern part of Buckinghamshire, and makes a beautiful appearance in the spring, when the trees are in blossom at the same time that the Beech is leafing. In Suffolk it abounds about Polstead, and from that is called the Polstead Cherry: in that county the Wild Cherries are called *Merries*, from the French *Merise*. The *Corone*, *Coroun*, or *Crown* Cherry, which is the highest improvement of this sort, is common in Hertfordshire, and about Bergh-Apton in Norfolk. The Black Cherry tree grows to a considerable height; Evelyn mentions one above eighty-five feet: when it attains that size, the timber, especially the redder sort, is fit to make stools, chairs, tables, and cabinets, as it will polish well, and is also very fit for pipes and musical instruments. In spring when in flower they are very ornamental in parks, the fruit is also food for birds, and the wood is useful for turners. They will thrive in poor land better than most other sorts. The stones are generally sown for raising stocks to graft or bud other Cherries upon, being of quicker growth and of longer duration. It is seldom grafted or budded. Where persons are curious to have the best-flavoured of this sort of fruit, they certainly may graft from such as produce the best. They are always trained as standards; the Coroun for the orchard, and the Small Wild Black and Red for park plantations.

18. Prunus Pennsylvanica; *Pennsylvanian* or *Upright Cherry Tree.* Umbels subsessile, aggregate, and many-flowered, at length panicle-shaped; leaves oblong, lanceolate, acuminate, smooth, glandular at the base. It flowers in May.—Native of North America.

19. Prunus Nigra; *Canadian Black Cherry Tree.* Umbels sessile, solitary, few-flowered; leaves deciduous, ovate, acuminate; petioles biglandular. It flowers in April and May.—Native of Canada.

20. Prunus Domestica; *Common Plum Tree.* Peduncles subsolitary; leaves lanceolate-ovate, convoluted; branches without thorns. This is a middling-sized tree, growing generally from sixteen to twenty-five feet, and branching into a moderately spreading head. The leaves are on short stalks, ovate, serrated, smooth, the younger ones downy; the flowers are white, generally on solitary stalks; the fruit, of a dark blue or purple colour, mostly elliptical or obovate. It loves a lofty exposure, and is not injurious to pasturage. The cultivated garden Plums are derived from this species, which is a native of Asia and Europe, but not of Great Britain; for though it is not uncommon in our hedges, the plants found there probably originated from some of the cultivated species, which, according to Pliny, came from Syria into Greece, and thence into Italy. The varieties of garden and orchard Plums are very numerous, differing in the form, taste, colour, and substance

of the fruit. Mr. Miller enumerates thirty, from which we select the following: 1. The White Primordian: this is a small, longish, white Plum, of a clear yellow colour, covered over with a white flew, which easily wipes off. It is a tolerably good bearer; and as it comes in very early, though it is mealy, and has little flavour, one tree of it should be admitted into a large fruit-garden. It ripens at the middle or latter end of July. 2. The Early Damask, or Morocco Plum: this is round-shaped, divided in the middle with a furrow like a Peach: the outside is of a dark black colour, covered with a light violet bloom; the flesh is yellow, and parts from the stone; it ripens at the end of July, and is much esteemed for its goodness. 3. The little Black Damask Plum: this is small and Black, covered with a light violet bloom; the juice is richly sugared; the flesh parts from the stone, and it bears well, ripening in the beginning of August. 4. The Orleans Plum, is so well known that it is only necessary to say, that the only reason for its being so general is, that it bears abundantly, and is on that account preferred by those who supply the fruit-markets, for it certainly is not an excellent Plum. It ripens in August. 5. The Black Perdigron Plum: this is a middling-sized and oval-shaped sort; the outside is of a very dark colour, covered over with a violet bloom; the flesh is firm, and full of an excellent rich juice. It ripens in August, and is greatly esteemed by the curious. 6. The Violet, or Blue Perdigron Plum, is a large, rather round than oval fruit, of a bluish-red colour on the outside; the flesh is of a yellowish colour, pretty firm, and closely adheres to the stone; the juice is exquisitely flavoured. It ripens in August. 7. The White Perdigron Plum: this is of an oblong figure; the outside is yellow, covered with a white bloom; the flesh is firm and well tasted. It is a very good fruit, either to eat raw or for sweetmeats, having an agreeable sweetness, mixed with an acidity. It ripens at the end of August. 8. The Red Imperial, or Bonum Magnum Plum, is a large oval-shaped fruit, of a deep red colour, covered with a fine bloom. It is very dry, but a great bearer, and excellent for sweetmeats. Ripe in September. 9. The White Imperial Bonum Magnum, White Holland, Mogul, or Egg Plum, is a large, oval-shaped, yellowish-coloured fruit, covered with a white bloom, the flesh is firm, but adheres closely to the stone. Having an acid taste, it is not so fit for eating as for baking, or making into sweetmeats. It is a great bearer, and ripens in September. 10. The Apricot Plum, ripens at the end of September, and is large and round, yellow-coloured on the outside, powdered over with a white bloom; the flesh is firm and dry, of a sweet taste, and comes clean from the stone. 11. The Dauphiny, or Large Queen Claudia Plum, has a number of other fantastical French names, and is one of the best Plums in England; it is of a middle size, round, and of a yellowish-green colour on the outside; the flesh is of a deep green colour, and parts from the stone. It is a great bearer, and has a very richly-flavoured juice. It ripens in the middle of September, and is confounded by most people in England by the name of Green Gage: but this is the sort that should be chosen, for there are three or four different sorts generally sold for it, one of which is small, round, and dry, but later ripe, and not worth preserving. 12. The Saint Catherine Plum, is a large, oval-shaped, rather flat fruit, amber-coloured on the outside, inside of a bright yellow colour; the flesh adheres firmly to the stone, and has a very agreeable sweet taste. It ripens at the end of September, and is very subject to dry upon the tree, when the autumn proves warm and dry. It makes fine sweetmeats, and is a plentiful bearer. 13. The Brignole Plum, which ripens in the middle of September, and is esteemed the best yet known for sweetmeats, is a large oval-shaped fruit, of a yellowish colour, mixed with red on the outside; the flesh is of a bright yellow colour, dry, and of an excellent rich flavour. 14. The Cherry Plum, so called from the fruit being generally of the size of the Ox-heart Cherry. It is round, red, and resembles a Cherry in the length of its stalk and general appearance, so as not to be distinguished at a distance. The blossoms of this tree come out very early in the spring, and, being tender, are very often destroyed by cold; but they afford a very agreeable prospect, for, being generally covered with flowers, which open about the same time as the Almonds, their appearance is most beautiful, though it is to be regretted that this early blossoming greatly diminishes the quantity of their fruit. 15. The White Pear Plum, we only notice, to say, that it affords the best of all stocks for budding the tenderer sorts of Peaches. 16. The Muscle Plum, is oblong and flat, of a dark red colour, with a large stone; the flesh being not well tasted, and very thin, it is chiefly used for stocks, like the White Pear Plum. 17. The Green Gage (see above, No. 11.) is the finest eating Plum we have, especially when it is tinged with purple. It ripens very well on standards or espaliers in August and September. 18. The Damascene, vulgarly called the Damson, is a small, roundish, dark-blue Plum. This kind has almost universally the reputation of being more wholesome than any other, and, being a great bearer, is largely cultivated in orchards, to supply the continual demand for it while in season. It ripens in September.—The ornamental varieties of this species, are the Double-blossomed, the Gold and the Silver striped, and the Stoneless Plum. Notwithstanding the popular disrepute of Plums as insalubrious, Woodville maintains, that when perfectly ripe, and taken in a moderate quantity, they are not unwholesome; though, when eaten unripe, they are more liable to occasion colics, diarrhœa, or cholera, than any other fruit of this class. In a medicinal point of view, they are emollient, cooling, and laxative, especially the dried French Prunes, imported from Marseilles; for though their opening power diminishes by drying, yet as they retain much of their acid, they are more laxative than the other dried fruits. Hence they are peculiarly beneficial to costive habits, and are frequently ordered in decoction with senna and other purgatives.—*Propagation and Culture.* All the varieties are propagated by budding or grafting upon stocks of the Muscle White Pear, or the Bonum Magnum Plum; and for the manner of raising these stocks, the reader is referred to the article *Nursery*. Budding Plum-trees is much preferable to grafting, because they are so very liable to gum wherever large wounds are made. The trees should not be more than one year's growth from the bud when they are transplanted; for if older, they are very subject to canker; or if they take well to the ground, commonly produce only two or three luxuriant branches. The manner of preparing the ground, if for walls, is the same as for Peaches; see *Amygdalus*. The distance between these trees should not be less than twenty-four feet against high walls, and, where the walls are low, thirty feet asunder. They require a middling soil, neither too wet and heavy, nor too light and dry. Those planted against walls should have an east or south-east aspect, which are more kindly to them than full south, on which they are subject to shrivel and become very dry: and many sorts will be extremely mealy, if too much exposed to the heat of the sun; but most sorts will ripen extremely well on espaliers, if rightly managed. Plums are sometimes planted for standards, and some of the ordinary sorts will in that case bear very well; but their fruit will not be near so fair as that produced on espaliers, besides being in greater danger of being bruised or blown down by

strong winds. The distance of placing them for espaliers must be the same as against walls; as must also their pruning and management: so that whatever is said concerning each, applies to both. As Plums do not only produce their fruit upon the last year's wood, but also upon cursons or spurs, which come out of wood that is many years old, there is no necessity of shortening the branches, in order to obtain new shoots annually in every part of the tree, as has been directed for Peaches, Nectarines, &c. for the more these trees are pruned, the more they grow, until their strength being thus exhausted, they gum and spoil. On this account, the safest method to manage these trees is, to lay in there shoots horizontally, as they are produced, at equal distances, in proportion to the length of their leaves; and where there is not a sufficient quantity of branches to fill up the vacancies of the tree, there the shoots, at the beginning of May, must be pinched in the same way as directed for those of the Peach-tree. This pinching will cause them to produce some lateral branches to supply those places; and during the growing season, all foreright shoots should be displaced, and such as are to remain must be regularly trained to the wall or espalier, which will not only render them beautiful, but also give to each part of the trees an equal advantage of sun and air, and thus always keep the fruit in a ductile growing state, which can seldom be when they are over-shaded with shoots for the first part of the season, and then suddenly exposed to the air by the taking off of those branches, or training them in their proper position. With this careful going over the trees in the growing season, they will require little attention in winter; for when the branches are shortened, the fruit is cut away, and the number of shoots increased, because whenever a branch is shortened, there are commonly two or three more shoots produced from the eyes immediately below the cut; so that by thus unskilfully pruning, many persons crowd their trees with branches, and thereby render what little fruit the trees produce very small and ill tasted, which is often the fact in many gardens, although the managers generally think themselves quite masters of their business. Nothing is more usual than to see every branch of a fruit-tree undergo the excisions of the knife, however improper it may be for the several sorts of fruit. It is also equally common to see these trees planted at the distance of fourteen or sixteen feet, so that the walls are in a few years covered with branches; and then all the shoots are cut and mangled with the knife, so as to appear like a stumped hedge, besides producing very little fruit: the only way, therefore, says Mr. Miller, to have Plum-trees in good order, is to give them room, prune them very sparingly, and extend their branches at full length.

21. Prunus Insititia; *Bullace Plum Tree.* Peduncles in pairs; leaves lanceolate-ovate, convoluted, villose underneath; branches terminated by a thorn. This is rather a humble tree, whose branches usually terminate in a spine: leaves alternate, on short stalks, serrated; flowers from different buds, in pairs, large, white; fruit globular, black, very austere, but so tempered by sweetness and roughness, as not to be unpleasant, especially after it is mellowed by frost; and a conserve is prepared of it, by mixing the pulp with thrice its weight of sugar. The bark of the root and branches is considerably styptic. An infusion of the flowers sweetened with sugar, is a mild purgative, not improper for children. It varies with black and white, or rather wax-coloured, fruit; and, as some say, with a red bitter unpleasant fruit, found in the hedges of Essex and Suffolk. It flowers in April, and is a native of Germany, Switzerland, France, and England.—This tree is raised from the stones; but the only certain way of continuing its varieties, is by grafting them upon any Plum or Bullace stocks. The stones may be sown in autumn in beds, two inches deep; keep them clean, and when they are two years old, plant them in rows, from two to three feet asunder, and train them to a single stem. When of a proper height, graft or bud them as other Plums; and when the heads are formed transplant them where they are to remain, any time from October to March, placing them eighteen or twenty feet asunder.

22. Prunus Spinosa; *Sloe Plum Tree*, or *Blackthorn.* Peduncles solitary; leaves lanceolate, smooth; branches thorny. Root creeping; stem shrubby, crooked, six or eight feet high, covered with a dark-coloured bark. Leaves stalked, serrated, dark-green, not appearing till the plant has blossomed; flowers solitary, white; fruit globular, black, very austere. This is not so well adapted to hedges as the White Thorn, because it spreads it roots wide, and encroaches upon the pasturage, but it is excellent for dead fences, and to lay in covered drains. The wood being hard and tough, is formed into teeth for rakes, and into walking-sticks. From some effects, says Dr. Withering, which I have repeatedly observed to follow a wound from the thorns, I have reason to believe there is something poisonous in them, particularly in autumn. The tender leaves dried, are sometimes used as a substitute for tea, and is the best substitute that has yet been tried: had they not been coloured with deleterious materials, and fraudulently sold as real East Indian Tea, no bad consequences would have followed; but these practices have lately been discovered, and justly punished. An infusion of an ounce of the flowers in water or whey, is a safe and easy purge; the bark dried, reduced to powder, and taken in doses of two drachms, will frequently cure some agues. The juice expressed from the unripe fruit is a very good remedy for fluxes of the bowels; it may be reduced by a gentle boiling to a solid consistence, in which state it will keep the year round, without losing any of its virtues. Letters marked upon linen or woollen with the juice of this fruit, will not wash out. Bruised, and put into wine, it communicates a beautiful red colour, and a pleasant subacid roughness. There is, in fact, too much reason to presume, that this juice enters largely into the British manufacture of *Port* Wine, in the same way that the leaves have been recently ascertained to form so large a part of what is called *Chinese* Tea. The Sloe is so harshly sharp and austere, as not to be eatable till it is mellowed by frost: its juice is extremely viscid, so that the fruit requires the addition of a little water, in order to admit of expression. That obtained from the unripe fruit, and inspissated to dryness by a gentle heat, is the German Acacia, and has been sold in the shops for the Egyptian Acacia, from which it differs in being harder, heavier, darker coloured, of a sharper taste, and more especially in giving out its astringency to rectified spirit. This fruit has been employed as a styptic ever since the time of Dioscorides. It has been recommended in diarrhœas and hæmorrhages, and as gargles in swellings of the tonsils and uvula. Dr. Cullen considers them as the most powerful of the acerb fruits, and as agreeable and useful astringents; but thinks the conserve, directed by the Medical College, contains a larger proportion of sugar than is necessary. This plant is at once useful and troublesome to the husbandman. If they be felled to the ground, the stubs intercept the scythe, and prevent the bite of cattle, and the thicket is soon renewed. If grubbed up by the roots, every fibril left in the soil produces a fresh plant; so that unless great care is had to take all these out, the grubbing up will increase instead of lessening the evil. If, however, they be cut off level with the surface, the scythe has free sweep, and the young shoots may be removed with ease and certainty. The same stroke that

mows the herbage will take off the shoots. If pastured, cattle and sheep will gnaw them to the quick, when they have no woodland left to brouze. It is, however, advisable always in this case to sweep the ground over with the scythe in the course of summer, to remove whatever the animals may have left. In the second year the shoots will rise, but are weak; and the roots themselves. which seldom survive the third year, will in a few years after be found quite rotten. After a thicket or border, where the sward is nearly lost, has been treated in this manner, rubbish of every kind should be raked off, a few grass-seeds scattered on, and the surface run over with the roller, as a preparation for the scythe. After headlands or borders are grubbed, they should be planted with potatoes, or some other cleansing crop that is well hoed, till the Blackthorns and other shrubs and hedge-weeds are totally eradicated, before they are laid down to grass. Thus pursued, grubbing more effectually answers the purpose than mowing. These modes of extirpation (for it abundantly propagates itself) apply not only to the Blackthorn, but to all kinds of shrubs and trees, except the Furze and Bramble.

23. Prunus Aspera. Flowers solitary, terminating; leaves ovate, serrate, rough. The upper surface of the leaves of this tree is so hard, that in Japan, where it is a native, they are employed in polishing.

24. Prunus Japonica. Peduncles solitary; leaves ovate, acuminate, smooth; branches unarmed.—Native of Japan.

25. Prunus Glandulosa. Peduncles solitary; leaves oblong, glandular-serrate; branches unarmed.—Native of Japan.

26. Prunus Incisa. Peduncles solitary; leaves ovate, gash-serrate, villose; branches unarmed.—Native of Japan.

27. Prunus Tomentosa. Peduncles solitary; leaves ovate, tomentose underneath.—Native of Japan.

28. Prunus Prostrata. Peduncles in pairs; leaves ovate, unequally serrate, without glands, tomentose underneath; stem prostrate.—Native of the mountains, and Mount Libanus. It approaches the habit of the Almond.

29. Prunus Serotina. Flowers in loose racemes; leaves deciduous, simply serrate; lowest serratures glandular.—Native of North America.

30. Prunus Dasycarpa. Flowers sessile; leaves ovate, acuminate, doubly serrate; petioles glandular.—Native of North America.

31. Prunus Semperflorens; *Ever-flowering Cherry.* Flowers in racemes; calices serrate; leaves ovate, serrate, glandular at the base.—This is suspected to be a mule, preserving its difference in our gardens.

32. Prunus Pigmæa; *Pigmy Plum.* Umbels sessile, few-flowered; leaves elliptic, acute, biglandular at the base, smooth.—Native of North America.

33. Prunus Cerasifera; *Myrobalan Plum.* Peduncles solitary; leaves elliptic, smooth; fruits pendulous, on branches almost destitute of prickles. This has been generally considered as a variety of the Common Plum. The branches are very smooth, but somewhat thorny.—Native of North America.

34. Prunus Chicasa. Buds aggregate, biflorous; pedicels very short; calix glabrous; segments obtuse; leaves oblong-oval, acute, or acuminate-serrulate; fruit subglobose; branches spinescent, very glabrous. Grows in Virginia and Carolina, and flowers in April and May.—This tree is known by the name of the Chicasaw Plum. The fruit is yellow, and agreeably tasted. It is mentioned in *Michaux's Flora*, that it was introduced by the Indians. This probably may be the case, as it generally only occurs where ancient camps of Indians have been.

Psidium; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-cleft, permanent; segments ovate. *Corolla:* petals five, ovate, concave, spreading, inserted into the calix. *Stamina:* filamenta numerous, shorter than the corolla, inserted into the calix; antheræ small. *Pistil:* germen roundish, inferior; style awl-shaped, very long; stigma simple. *Pericarp:* berry oval, very large, crowned with the calix, one or many celled. *Seeds:* numerous, very small, nestling. Essential Character. *Calix:* five-cleft, superior. *Petals:* five. *Berry:* one-celled, many-seeded.——The species are,

1. Psidium Pyriferum; *White Guava.* Leaves elliptic, pubescent underneath; peduncles one-flowered. In its wild state this tree grows to the height of seven or eight, sometimes of twelve, feet. In the gardens of the West Indies, where the soil is good, it equals a middle-sized Apple-tree, the trunk being six feet high, and a foot and a half in circumference. The wood is very hard and tough, used for ox-yokes and similar purposes, and very well adapted for fuel. The fruit is smooth, having a peculiar smell: on the outside it is yellow, whitish, or sulphureous, and is roundish, or more oblong, the size of a hen's egg, or bigger, according to the soil: the rind is a line or two in thickness, brittle, and fleshy: the pulp rather firm, full of bony seeds; it is flesh-coloured, sweet, aromatic, and pleasant. It is eaten with avidity, not only by the natives, but by Europeans, though it is apt to flux the latter; yet Jacquin declares, that when he has been thirsty on a journey, he has eaten to satiety of it without any inconvenience. It is eaten raw in the desert places, though the seeds are scarcely separable; and is also preserved in sugar.—Native of both Indies, Cochin-china, and the southern provinces of China; becoming a large tree when cultivated, but much smaller and of an irregular growth, with distorted branches, in a wild state. In the Caribbee Islands it frequently overruns the pastures; and one tree in a garden will suffice to fill the whole, for the seeds pass through the bodies of men and animals without losing their vegetative quality.—This plant, with all its congeners, is propagated by seeds, which must be procured from the country where they naturally grow. If they were brought over in the fruit, gathered full ripe and kept entire, they would be more certain of succeeding. They should be sown in pots filled with rich kitchen-garden earth, and plunged into a hot-bed of tanners' bark, giving them water from time to time as the earth dries. If the seeds are good the plants will appear, and must have free air admitted to them in proportion to the warmth of the season. When they have acquired strength enough to bear removal, let them each be transplanted into a small pot filled with the same earth, and plunged into a fresh hot-bed, shading them from the sun until they have taken new root; then they should have a large share of free air admitted to them every day in warm weather, to prevent their drawing up weak: they should also be frequently refreshed with water in the summer. When the plants have filled these small pots with their roots, they should be taken out, and their roots parted, and put into larger pots filled with the same kind of earth, and plunged into the hot-bed again, where they should remain till autumn, and then be plunged into the tan-bed in the dry-stove. During the winter they should have a moderate warmth, and not too much water, and in summer they will require plenty of wet, and in hot weather a great share of air: under this management they will produce flowers and fruit in the third year, and may be continued a long time.

2. Psidium Pumilum; *Dwarf Guava.* Leaves lanceo-

late, acute, tomentose underneath; peduncles one-flowered. This has exactly the appearance of the preceding species, but is five times smaller in all its parts; being a shrub about two feet high; fruit the size of a hazel nut.—Native of Ceylon.

3. Psidium Aromaticum; *Aromatic Guava.* Leaves ovate, acuminate, smooth; peduncles one-flowered, bracted. This is a moderate tree, with a trunk about five feet in height, and branching at the top in a scattered manner. The fruit is globular, like a cherry, aromatic, and eatable. The bruised leaves have the smell of Balm.—It is a native of Cayenne and Guiana, growing in woods, and flowering in the month of October.

4. Psidium Grandiflorum; *Great-flowered Guava.* Leaves ovate, acuminate, smooth; peduncles one-flowered, bracted. This also is a middling-sized tree, branching from the top in an irregular manner. The flowers spring from the young branches: they are large and showy, white, and have a very agreeable odour.—Native of the woods of Cayenne; where it flowers in December, and produces the fruit, the seeds of which are enveloped in a succulent pulp, in February.

5. Psidium Decaspermum. Leaves ovate, acuminate, pubescent; peduncles one-flowered, bracted. This is a smooth shrub. Fruit small, globular, rugged. It differs from Guajava only in having all the seeds inserted, instead of their being in every position; in their being straightish, and not kidney-form; and in having no partition whatever.—Native of Otaheite, and the other Society Islands.

6. Psidium Pomiferum; *Red Guava.* Leaves oblong-lanceolate, pubescent underneath; peduncles three-flowered. This has a pretty thick trunk, twenty feet in height, covered with a smooth bark, and towards the top dividing into many angular branches; fruit shaped like a pomegranate; crown when ripe having an agreeable odour.—Native of both Indies, and of the woods of China and Cochin-china. In the latter countries, according to Loureiro, the fruit is eatable, but both the taste and smell of it is bad and unpleasant. The roots and younger leaves are astringent, and esteemed useful in curing fluxes, and strengthening the stomach.

7. Psidium Guianense; *African Guava.* Leaves ovate, quite entire, tomentose underneath; peduncles three-flowered. A small, smooth tree: the fruit small, roundish, tawny outside, deep red within, of a most grateful and exquisitely sweet taste.—Native of Prince's Island on the coast of Guinea, and cultivated in San Domingo.

8. Psidium Montanum; *Mountain Guava.* Leaves oblong, acuminate, crenulate, shining; peduncles many-flowered.—This is one of the largest trees in the woods of Jamaica, growing frequently to the height of sixty or seventy feet, with a proportioned thickness. The flowers are white, and fragrant, resembling those of the White Guava: the fruit is acid. It is an excellent timber wood, of a dark colour, and curled grain, works easily, takes a fine polish, and makes very beautiful walking-sticks.

Psoralea; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, dotted with tubercles, five-cleft; segments acute, equal, permanent; the lowest double the length of the others. *Corolla:* papilionaceous, five-petalled; standard roundish, emarginate, rising; wings crescent-shaped, blunt, small; keel two-petalled, crescent-shaped, blunt. *Stamina:* filamenta diadelphous, one single and bristle-shaped, nine united, ascending; antheræ roundish. *Pistil:* germen linear; style awl-shaped, ascending, the length of the stamina; stigma blunt. *Pericarp:* legume the length of the calix, compressed, ascending, acuminate. *Seed:* single, kidney-form. Essential Character. *Calix:* besprinkled with callous dots, the same length with the legume. *Stamina:* in two distinct sets. *Legume:* single-seeded, somewhat beaked, without valves. ——The species are,

1. Psoralea Rotundifolia; *Round-leaved Psoralea.* Leaves simple, ovate, quite entire; heads and bractes villose.—Native of the Cape. It only requires, like all its congeners from the Cape, the protection of a green-house or glass-case. See the second species.

2. Psoralea Pinnata; *Wing-leaved Psoralea.* Leaves pinnate, linear; flowers axillary. It rises with a soft shrubby stalk four or five feet high, much branched; leaves alternate, stalked, dark-green; leaflets about an inch long, narrow; stipules in pairs, ovate, pointed, flowers the size of the Laburnum, blue, with white claws. It flowers during the greater part of the summer, and the seeds ripen in autumn.—Native of the Cape. This is easily propagated by seeds sown upon a moderate hot-bed. When the plants come up, they should have much air and little heat; when they are of a size to remove, plant them in separate small pots filled with light earth. Plunge them into the new bed, shading them from the sun till they have taken new root, and gradually inure them to the open air, into which they should be removed about the end of May; and keep them abroad till October, then placing them in the green-house. It may also be increased by cuttings of the young shoots, planted, during any of the summer months, on a bed of light earth, covering them close with bell or hand glasses, shading them, and gently refreshing them with water as the ground dries: when they have taken root, harden them gradually, transplant them into small pots, and treat them like the seedling plants.

3. Psoralea Aculeata; *Prickly Psoralea.* Leaves ternate; leaflets wedge-form, recurved, mucronate; flowers axillary, solitary, approximating.—Found in ditches at the Cape.

4. Psoralea Bracteata; *Oval-spiked Psoralea.* Leaves ternate, obovate, recurved, mucronate; spikes ovate. It flowers in June and July. The flowers are numerous at the ends of the branches; standard violet; wings and keel blue.—Native of the Cape.

5. Psoralea Spicata; *Long-spiked Psoralea.* Leaves ternate, oblong, blunt; spikes cylindric.—Native of the Cape.

6. Psoralea Angustifolia; *Narrow-leaved Psoralea.* Leaves ternate, linear; peduncles axillary, solitary or trine, few-flowered.—Native of the Cape.

7. Psoralea Axillaris; *Axillary Psoralea.* Leaves ternate; leaflets lanceolate; peduncles axillary, one-flowered.—Native of the Cape.

8. Psoralea Stachydis. Leaves ternate, petioled; leaflets oblong, mucronate; spikes terminating, interrupted; calices villose.—Native of the Cape.

9. Psoralea Aphylla; *Leafless Psoralea.* Leaves none; stipules mucronate, very short, subimbricate towards the flowers. The long leafless scaly branches terminate in a longish cluster of several flowers, whose standard is blue, the other petals white.—Native of the Cape.

10. Psoralea Tenuifolia; *Fine-leaved Psoralea.* Lower leaves ternate; upper simple, lanceolate-subsessile.—Native of the Cape.

11. Psoralea Capitata; *Headed Psoralea.* Leaves ternate and simple, linear; head terminating.—Native of the Cape.

12. Psoralea Hirta; *Hairy Psoralea.* Leaves ternate; leaflets obovate, recurved, mucronate; flowers tern-spiked; calices tomentose.—Native of the Cape.

13. Psoralea Decumbens; *Trailing Psoralea.* Leaves ternate; leaflets wedge-lanceolate, with a recurved point; flowers axillary.—Native of the Cape; flowering in May.

14. Psoralea Repens; *Creeping Psoralea.* Leaves ternate;

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P. 398.

PRENANTHES SERPENTARIA.

— *Lion's-root.*

P. 419.

PSORALEA ESCULENTA.

Esculent Psoralea.

H. Frederick sc.

Published by Fisher, Son & C° Caxton, London, 1838.

obovate, emarginate; stem creeping; flowers subumbelled, blue.—Native of the Cape.

15. Psoralea Bituminosa; *Bituminous Psoralea.* All the leaves ternate; leaflets lanceolate; footstalks downy, without glands; spikes capitate, stalked, axillary. Roots perennial, but the stalks seldom last beyond two years. The leaves, if handled, emit a strong scent of bitumen. The corollas are blue.—Native of Italy, Sicily, and the south of France, and also of Barbary. It is propagated by seeds, which should be sown on a bed of light earth in April: in May the plants will come up, when they should be kept clean from weeds, and transplanted as soon as they are fit to remove. It will live through a favourable winter in a warm dry border; but it is generally sheltered in a green-house or glass-case.

16. Psoralea Glandulosa; *Stripe-flowered Psoralea.* All the leaves ternate; leaflets lanceolate; petioles rugged; flowers in spikes. It flowers from May to August.—Native of Peru, Spain, and the Balearic Isles.

17. Psoralea Palestina; *Palestine* or *Herbaceous Psoralea.* All the leaves ternate; leaflets ovate; petioles pubescent; flowers in heads. They are large, and violet-coloured.—Native of the Levant.

18. Psoralea Americana; *American Psoralea.* Leaves ternate; leaflets ovate, tooth-angular; spikes lateral.—Native of Madeira.

19. Psoralea Tetragonoloba. Leaves ternate, toothed; stem flexuose; spikes lateral; legumes strict, quadrangular; flowers alternate, on very short pedicels, a little larger than those of *Indigofera*, (to which genus it is suspected to belong;) having an acute keel, without the lateral horns of that plant.—Found by Forskahl in Arabia.

20. Psoralea Corylifolia; *Hazel-leaved Psoralea.* Leaves simple, ovate, somewhat toothed; spikes ovate. The habit is herbaceous: the flowers are produced on long slender axillary peduncles, and are collected into small round heads of a pale flesh-colour. It flowers in July, and grows naturally in India.—Sow the seeds upon a hot-bed in the spring: when the plants are fit to remove, plant them in separate small pots filled with light earth, and plunge them into a moderate hot-bed of tanners' bark, and shade them until they have taken new root; after which admit air freely to them in warm weather, and water them gently as often as necessary. When the plants have filled the pots with their roots, remove them into larger, and at the beginning of July place them in an airy glass-case, where they may be defended from cold, but have free air in warm weather; and thus treated, they will flower and ripen their seeds.

21. Psoralea Pentaphylla; *Five-leaved Psoralea.* Leaves digitate, quinate; leaflets unequal.—Native of Mexico and Malabar.

22. Psoralea Prostrata; *Prostrate Psoralea.* Leaves superdecompound, digitate, linear.—Native of the Cape.

23. Psoralea Dalea; *Annual Psoralea.* Leaves pinnate; spikes cylindrical, terminating. The flowers are collected in close oblong spikes at the ends of the branches; they are small, and of a bright blue colour. Native of New Spain.—Sow the seeds on a hot-bed; and treat them, when they come up, in the same way as other plants from hot countries. Keep those sorts which are perennial in a moderate warmth in the stove during winter, giving them a good share of free air in summer.

24. Psoralea Enneaphylla; *Nine-leaved Psoralea.* Leaves pinnate; spikes axillary. This is an upright slender shrub, five feet high, with a few pliant branches. On the back of the leaflets are little dots that appear like bags, as in *Hypericum Perforatum*, containing a gummy juice of an unpleasant smell: if rubbed, they stain the fingers of a yellow colour, and tinge water of a very beautiful clear yellow, which can hardly be washed out, and becomes gradually deeper.—Native of New Spain, in the coppices near Carthagena, flowering in May and the following month. It is propagated like the preceding species.

25. Psoralea Lævigata; *Polished Psoralea.* Leaves pinnate; stipules solid, subacute, very minute; flowers purple, not striated; pollen golden and shining.—Native of the Cape.

26. Psoralea Leporina; *Downy-spiked Psoralea.* Leaves pinnate, oblong-linear, very numerous; spikes without bractes, villose, lanceolate; root annual; stem smooth, striated. It flowers in October and November.—Native of Mexico. Propagated as the twenty-third species.

27. Psoralea Foliolosa; *Leafy Psoralea.* Leaves pinnate, oblong, numerous; spikes terminating, bracted, globular-ovate; calices compressed. Stem round, smooth, having ferruginous glands scattered over it, branched; corolla purple, pale at the base. It flowers in October and November.—Native country unknown. Treat it like the twenty-third species.

28. Psoralea Reclinata; *Reclining Psoralea.* Stem procumbent; leaves pinnate; flowers in close spikes; keel longer than the other petals.—Native of Mexico. Treat it in the same manner as the twenty-third species.

29. Psoralea Hirta. Leaves ternate; leaflets ovate; stem shrubby, hairy; flowers in terminating spikes; corollas purplish.—Native of South America. It requires the same management as the twenty-third species.

30. Psoralea Procumbens. Leaves pinnate, silvery; stems procumbent; flowers axillary. They are small and purple, and in small clusters.—Native of Malabar. Managed like the twenty-third species.

31. Psoralea Scandens; *Climbing Psoralea.* Leaves pinnate; stem branched, climbing; flowers axillary, sessile. They are small, of a bright blue colour, in little clusters.—Found at Campeachy.

32. Psoralea Capitata; *Headed Psoralea.* Leaves ternate; stem very branching, shrubby; flowers in heads, peduncled, axillary; corollas blue.—Found at Campeachy.

33. Psolea Humilis; *Humble Psoralea.* Leaves pinnate, with rounder villose leaflets; flowers in axillary and terminating heads; stems shrubby.—Found at Vera Cruz.

34. Psoralea Argophylla. Plant on every side silver-tomentose; leaves ternate; little leaves lanceolate-oblong; spikes terminal, interrupted; bractes ovate, acuminate; flowers subopposite, sessile, purple.—Grows on the banks of the Missouri. The silvery tomentum of this plant gives it a particularly handsome appearance.

35. Psoralea Esculenta; *Esculent Psoralea.* Plant on every side villose; leaves digitate-quinate; little leaves lanceolate, unequal, plain, very entire; spikes axillary, thick-flowered; segments of the calix lanceolate, a little shorter than the corolla; legumes ensiform-rostrate. Root simple, somewhat fusiform, bulbous above the middle; flowers pale blue.—Grows on the banks of the Missouri. "This plant," observes Pursh, "produces the famous *Bread-root* of the American Western Indians, on which they partly subsist in winter. They collect them in large quantities; and, if for present use, they roast them in the ashes, when they give a food similar to yams: if intended for winter use, they are carefully dried, and preserved in a dry place in their huts. When wanted for use, they are mashed between two stones, mixed with some water, and baked in cakes over the coals. It is a wholesome and nourishing food, and, according to Mr. Lewis's observation, agreeable to most constitutions; which, he observed, was not the case with the

rest of the roots collected by those Indians for food. This root has been frequently found by travellers in the canoes of the Indians, but the plant which produces it has not been known until lately." Mr. Thomas Nuttall says, "The taste of the root is rather insipid, but not disagreeable either raw or boiled; the latter is its common mode of preparation among the savages: its texture is laminated, always tenacious, solid, and never farinaceous; it is also somewhat medicinal, and operates as a diuretic."

36. Psoralea Lupinellus. Leaves quinate-digitate; little leaves in very fine lines; spikes with few flowers; legumes ovoideous, uncinate-mucronate, nervose-rugose.—Is found in the barrren fields of Carolina. The leaves of the seven last species of this genus are covered with resinous dots.

37. Psoralea Canescens. The whole plant canescent; leaves shortly petiolate, trifoliate; spikes with loose flowers; flowers pedicelled; calix very villose.—Grows in the barren sandy fields of Carolina and Georgia, and flowers in July.

38 Psoralea Melilotoides. Plant slightly pubescent; leaves ternate; little leaves lanceolate; spikes oblong; bractes lato-cordate, acuminated at great length; legumes rotund, very much wrinkled, and nervose; flowers blue.—Grows in pine-barrens from Carolina to Florida, and flowers from June to August.

39. Psoralea Tenuiflora. Plant pubescent, very branchy; leaves ternate; little leaves elliptical, rugose-punctated on both sides; peduncles axillary, longer than the leaf, somewhat triflorous; flowers very small, pale blue.—Grows on the banks of the Missouri.

40. Psoralea Lanceolata. Plant pubescent; leaves ternate; little leaves elongate-lanceolate; petioles thick; spikes axillary, scarcely longer than the leaf, thick-flowered; flowers pedicellated, small, bright blue; bractes scarcely longer than the pedicel; teeth of the calix coloured.—Grows on the banks of the Missouri, and flowers in July and August.

Psychotria; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth very small, five-toothed, superior, permanent. *Corolla:* monopetalous, salver-shaped or funnel-shaped; tube long; border short, five-cleft; segments obovate, acute. *Stamina:* filamenta five, capillary; antheræ linear, erect, not exceeding the tube. *Pistil:* germen inferior, roundish; style filiform; stigma bifid, with the segments thickish, blunt. *Pericarp:* berry roundish, ovate, or oblong, one-celled, (or, according to Gærtner, two-celled,) crowned with the calix. *Seeds:* two, hemispherical or oblong, on one side convex and five-grooved, on the other flat. Essential Character. *Calix:* five-toothed, crowning. *Corolla:* tubular. *Berry:* globular. *Seeds:* two, hemispherical, grooved.——The species are,

1. Psychotria Asiatica. Stipules emarginate; leaves lanceolate, ovate.—Native of the East and West Indies.

2. Psychotria Glabrata. Stipules acute, undivided, deciduous; leaves ovate, very smooth, shining; flowers panicled, erect.—Native of Jamaica, in the interior of the island, upon rocky places.

3. Psychotria Axillaris. Stipules acute, undivided; leaves ovate-acute; flowers axillary. Native of the woods of Guiana.

4. Psychotria Laurifolia. Stipules ovate, acuminate, deciduous; leaves lanceolate, ovate, acute, thickish, smooth; panicles erect; berries roundish.—Native of Hispaniola in dry coppices, also of Jamaica.

5. Psychotria Parviflora. Stipules ovate, cuspidate, deciduous; leaves elliptic, ovate, acuminate, parallel, veined; panicles erect; berries oval. The trunk of this species is ten or twelve feet high, with many branches at the top, and the bark reddish brown on the outside, and red within; flowers in terminating racemes; corolla white. The bark dyes silk and cotton of a fine red.—Native of the great forests of Guiana, especially in wet places.

6. Psychotria Hirsuta. Stipules lanceolate, entire, deciduous; leaves lanceolate, ovate, acute, rough-haired; stem extremely hirsute; panicle spreading. This differs from the rest of the genus in its very remarkable shagginess and extremely spreading habit.—Native of old woods in the southern parts of Jamaica.

7. Psychotria Fœtens. Stipules acuminate, entire, deciduous; leaves lanceolate, ovate, acute, smooth; panicle spreading very much; branches reflex, filiform. This differs from the preceding in its smoothness, and in having the branches of the panicle reflex. A peculiar and very fœtid subacid odour proceeds from the bruised leaves or broken branches, like that in *Comocladia Dentata* and *Schradera Capitata.*—Native of Jamaica, in the mountainous woods of the southern parts.

8. Psychotria Citrifolia. Stipules ovate, permanent; leaves elliptic, acuminate, subcoriaceous; panicles short; berries oblong, ribbed. The leaves are very like those of the Lemon in colour and consistence.—Native of the West Indies.

9. Psychotria Nitida. Stipules roundish, deciduous; leaves roundish, ovate, acuminate; panicle terminating; border of the corolla longer than the tube.—It flowers in September, on the banks of the river Sinemari in Guinea, where it is a native.

10. Psychotria Marginata. Stipules entire, acuminate, deciduous; leaves lanceolate, ovate, acute, cartilaginous-bristly at the end; panicle loose.—Found in the woods of Jamaica, flowering in spring.

11. Psychotria Tenuifolia. Stipules ovate, emarginate, deciduous; leaves oblong, acute, very thin, smooth; panicles erect, subsessile.—Native of Hispaniola, in coppices.

12. Psychotria Nervosa. Stipules oblong, emarginate, deciduous; leaves ovate, acuminate at both ends, nerved, somewhat waved; panicles sessile, almost erect. Willdenow observes, that the leaves are not properly nerved, but have prominent veins.—Native of Jamaica, in coppices.

13. Psychotria Carthaginensis. Stipules emarginate; leaves obovate, acuminate; panicle terminating. It is a suberect branched shrub, the height of a man. It flowers in August at Carthagena in New Spain, where it is a native; very common in coppices and hedges, and among bushes.

14. Psychotria Myristiphyllum. Stipules ovate, deciduous; leaves lanceolate-ovate, nerveless, shining, rigid; branches directed one way; racemes compound, terminating.—Native of dry coppices, among Logwood, in the northern parts of Jamaica. Browne says it is common about the ferry, and in the savannas, near Hunt's Bay.

15. Psychotria Laxa. Stipules ovate, acute, deciduous; leaves ovate, acuminate; racemes in threes, terminating, trichotomous; branches and pedicels subcapillary, loose.—Native of Jamaica, on mountainous coppices.

16. Psychotria Parasitica. Stipules embracing, retuse; leaves ovate, acuminate, veinless, somewhat succulent; racemes terminating or axillary, compound.—Native of the West Indies, in mountainous woods, where it grows for the most part parasitically, on the trunks of aged trees.

17. Psychotria Horizontalis. Stipules ovate; leaves lanceolate, ovate, acute; branches, leaves, and branchlets of the panicles horizontal. It may be distinguished from all the rest at first sight by the disposition of the branchlets.—Native of Hispaniola, on open spots, in a cretaceous soil.

18. Psychotria Nutans. Stipules two-toothed; leaves lan-

ceolate, acute, nerved; racemes three-parted, erect, in their fruiting state nodding.—Native of Hispaniola, in open spots, in a cretaceous soil.

19. Psychotria Speciosa. Arboreous: leaves oblong, lanceolate; involucre terminating, subtriflorous.—Native of the island of Otaheite.

20. Psychotria Involucrata. Stipules two-toothed; leaves lanceolate, ovate, shining; racemes terminating, corymbed; pedicels three-flowered; flowers involucred.—Native of Jamaica and Guiana.

21. Psychotria Flexuosa. Stipules two-toothed; leaves ovate, attenuated to both ends; panicle divaricating, flexuose.

22. Psychotria Racemosa. Stipules two-lobed; leaves oblong, acuminate; raceme terminating, simple; flowers involucred.—Native of Guiana, in the woods of Orapu, flowering and fruiting in August.

23. Psychotria Violacea. Stipules oblong, blunt, deciduous; leaves oblong, acuminate; flowers, panicle corymbed, involucred.—Native of Guiana in woods, flowering in July.

24. Psychotria Brachiata. Stipules ovate, bifid; raceme terminating, compound; branches brachiate; flowers aggregate, sessile.—It flowers in May and June, on high mountains, in the southern parts of Jamaica.

25. Psychotria Grandis. Stipules deltoid, revolute at the edge, awl-shaped at the tip; leaves cuneiform, obovate; stem angular.—Native of mountain-coppices in the interior of Jamaica, flowering in April.

26. Psychotria Patens. Stipules two-toothed; leaves distich, lanceolate-ovate, membranaceous; branches spreading; panicles directed one way. This is a singular species, the branches of the panicle divaricating, and being all directed one way.—Native of Jamaica, on the Blue Mountains.

27. Psychotria Uliginosa. Stipules connate, acute, convex; leaves lanceolate-oblong; seeds compressed, crested; stem subherbaceous, simple, erect.—It flowers in spring, and is a native of Jamaica, in wet places upon the mountains.

28. Psychotria Serpens. Stem subherbaceous, creeping; leaves ovate-acute at both ends.—Native of the East Indies.

29. Psychotria Herbacea. Stem herbaceous, creeping; leaves cordate, petioled. It produces flowers and ripe fruits in December.—Native of Jamaica, and various parts of the East and West Indies.

30. Psychotria Emetica; *Ipecacuanha Plant.* Herbaceous, procumbent: leaves lanceolate, smooth; stipules extrafoliaceous, subulate; heads axillary, peduncled, few-flowered. Root perpendicular, roundish, somewhat branched; leaves crowded; stipules deciduous; flowers axillary, white, stalked, from two to five on each stalk; berry nearly ovate.—Native of the warmest parts of North America. This plant is supposed to be the genuine Ipecacuanha: there are three sorts of the root in our shops; the ash-coloured or gray, the brown, and the white. The ash-coloured is brought from Peru, and is a small wrinkled root, bent into a great variety of figures, brought over in short pieces full of wrinkles, and deep circular fissures, down to a small white woody fibre that runs in the middle of each piece; the cortical part is compact and brittle, and looks smooth and resinous on breaking: it has very little smell; the taste is bitterish and subacrid, covering the tongue as it were with a kind of mucilage. The brown is small, somewhat more wrinkled than the above, of a brown-blackish colour without, and white within; this was brought from Brazil. The white sort is woody, has no wrinkles, and no perceptible bitterness; the ash-coloured is that usually preferred for medicinal use; the brown, even in a small dose, has been sometimes observed to produce violent effects; but the white, though taken in large quantities, has scarcely any effect at all. Dr. Irving has ascertained by experiments, that this root contains a gummy and resinous matter, and that the gum is in much greater proportion, and is more powerfully emetic, than the resin; that the cortical is more active than the woody part; and that the whole root possesses an antiseptic and astringent quality. The same physician observes, that its emetic property is most effectually counteracted by means of the acetous acid, insomuch that thirty grains of the powder, taken in two ounces of vinegar, produced only some loose stools. This medicine was first publicly noticed in the middle of the seventeenth century, but did not enter into the general practice till Helvetius employed it in the Hotel de Dieu, at Paris. Experience has proved it to be the mildest and safest emetic with which we are acquainted; having this peculiar advantage, that if it does not operate by vomit, it discharges itself by the usual evacuations. It was at first introduced with the character of an almost infallible remedy in dysenteries and other inveterate fluxes, and also in disorders proceeding from obstructions of long standing; nor has it since lost much of its reputation. In the spasmodic asthma, Dr. Akenside remarks, that where nothing contraindicates repeated vomiting, he knows no medicine so effectual. In violent paroxysms, a scruple procures immediate relief; where the complaint is habitual, from three to five grains every other morning, may be given for a month or six weeks. It has also been employed with success in hæmorrhages. Several cases of menorrhagia are mentioned by Dahlberg, in which one-third or half a grain was given every four hours till it effected a cure. These small doses are likewise found of great use in catarrhal and even consumptive cases, as well as in various states of fever. Cullen informs us, that he knew a practitioner who cured intermittents by giving five grains of Ipecacuanha, or enough to excite nausea, an hour before the accession of the fit was expected; and, that another proposed to cure agues by emetics given at the time of accession, or at the end of the cold stage, and was also successful. In short, Pringle, Lewis, Motherby, and Akenside, agree that this vomit may be ventured on in almost every case where the stomach requires to be unloaded of its contents. The common dose, when it is intended to vomit, is from ten grains to a scruple for a grown person, and in proportion for others. As a specific in the bloody flux, repeated experiments have established its reputation, and confirmed its efficacy, not only when given as an emetic, but in such small doses as scarcely produce any visible effect. In the slighter kinds of the disease it commonly performs a cure in a very short time, not by acting as an astringent, but apparently by promoting a gentle perspiration, which is here for the most part obstructed. Most of the common sudorifics, or sweating medicines, in these cases pass off without producing any effect. But if, after taking a puke of Ipecacuanha, the patient is covered up warm in bed, a gentle sweat soon succeeds, by which the disease is often terminated at once. But though in the putrid or malignant kinds of this disease it is not so speedily efficacious, it should by no means be omitted, either in small doses by itself, or joined with such other medicines as the case may require. This root, in its powdered state, is now, in fact, advantageously employed in every disease where vomiting is indicated, and, combined with opium, under the form of *Pulvis Sudorificus*, it furnishes us with the most useful and active sweating medicine which we possess. It is also given with good effects in those very small doses which produce no sensible operation. The *full* dose in substance is *one scruple*. The officinal preparation, sold by the druggists, is Vinum Ipecacuanhæ, or Ipecacuanha Wine.

31. Psychotria Corymbosa. Stipules two-toothed; leaves lanccolate, ovate, acute, subrigid, shining; flowers in corymbs; peduncles and pedicels coloured.—Native of the high mountains of Jamaica.

32. Psychotria Pubescens. Stipules two-toothed; leaves lanceolate, ovate, acuminate, pubescent; panicles cymed, spreading.—Common in Jamaica, and the other islands.

33. Psychotria Pedunculata. Stipules two-toothed; leaves ovate-lanceolate, somewhat wrinkled; flowers in a sort of cyme; common peduncle elongated.—Native of mountain-woods, in the interior of Jamaica.

34. Psychotria Crocea. Stipules two-toothed; leaves ovate, acute, nerved; panicles erect, and peduncles saffron-coloured. —Native of the West Indies, in mountainous coppices.

35. Psychotria Alpina. Stipules two-toothed; leaves lanceolate, ovate, membranaceous, netted-veined; panicles erect; corollas elongated, diaphanous.—Found on the Blue Mountains in Jamaica.

36. Psychotria Paniculata. Stipules two-toothed; leaves ovate; panicle erect; stem arboreous.—Found at Surinam, and in South America.

37. Psychotria Palicurea. Stipules two-lobed; leaves broad, ovate, acuminate at both ends; panicles erect; corollas cylindrical, ventricose, somewhat curved, mealy on the outside.—Native of the West Indies and Guiana.

38. Psychotria Lutea. Stipules two-lobed; leaves broad-ovate, acuminate; panicle erect; tube of the corolla narrowed at the base; segments of the border acute.—It flowers in September, on Mount Courose in Guiana, where it is a native.

39. Psychotria Longiflora. Stipules two-lobed; leaves ovate-lanceolate, acuminate; raceme terminating, almost simple; tube of the corolla curved in; segments of the border bluntish.—Native of barren places in Cayenne and Guiana, where it flowers in July and August.

Ptelea; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Male. Calix:* perianth four-parted, acute, small, deciduous. *Corolla:* petals four, oblong, concave, spreading, larger than the calix, coriaceous. *Stamina:* filamenta four, awl-shaped, erect, curved in at the top, flattish, and villose at the base, almost the length of the corolla; antheræ roundish. *Pistil:* germen ovate, small, abortive; style very short, bifid at the top; stigmas obsolete. *Female. Calix* and *Corolla:* as in the male. *Stamina:* filamenta as in the male, much shorter than the corolla; antheræ roundish, barren. *Pistil:* germen ovate, compressed, biggish; style short, compressed; stigmas two, bluntish, diverging. *Pericarp:* drupe roundish, large, juiceless, compressed, membranaceous, winged, two-celled. *Seeds:* solitary, oblong, attenuated upwards. *Observe.* Some of the flowers have a five-cleft calix, and a five-petalled corolla: in these, and even in the flowers that are four-cleft, there are often five, six, and seven stamina. Each of the germina contains two seeds, but only one of them, and sometimes only one in the whole drupe, comes to perfection. In the female flowers, the antheræ are sometimes polliniferous, and hence this genus might be referred to the class Polygamia, though Willdenow still places it in the class Tetrandria, where it was left by Linneus. Essential Character. *Calix:* four-parted, inferior. *Corolla:* four-petalled. *Stigmas:* two. *Fruit:* with a roundish membrane, having one seed in the middle.——The only known species is,

1. Ptelea Trifoliata; *Three-leaved Ptelea,* or *Shrubby Trefoil.* It rises with an upright woody stem, ten or twelve feet high, dividing upwards into many branches, covered with a smooth grayish bark, garnished with trifoliate leaves standing upon long footstalks. The flowers are produced in large bunches at the ends of the branches; they are of an herbaceous white colour.—Native of shady moist hedges, and the edges of woods among rocks, from New York to Carolina, flowering in June. This shrub may be propagated by cuttings, planted in pots of fresh rich earth, and plunged into a moderate hot-bed. The best time for this is in the beginning of March; but they must be carefully managed, so as not to have too much heat, and be shaded from the sun in the middle of the day, otherwise they will not succeed. It may also be propagated by layers, but these are often two years before they take root; and, if good seeds can be procured either at home or from abroad, the plants raised from them will be much stronger. The seeds may be sown in the beginning of April, on a bed of light earth, in a warm sheltered situation, where, if the ground be moistened in dry weather, the plants will come up in six weeks; but if the seeds are sown in pots, and placed on a very moderate hot-bed, they will come up much sooner, and make greater progress in the first year: but they must not be forced or drawn, for that would make them very tender; therefore in June the plants should be exposed to the open air in a sheltered situation, where they may remain till the frost comes on, when those in the pots should be either placed under a common frame to shelter them from severe frosts, or the pots plunged into the ground near a hedge, that the frost may be prevented from penetrating through the sides of the pots to the roots of the plants. In the following spring they may be planted into a nursery-bed, at about one foot distance, where they may grow two years, by which time they will be fit to transplant whither they are designed to remain. These plants are rather tender while young, and will, on that account, require some protection in the first and second year, but particularly from the early frosts in autumn, which frequently kills the tops of the tender shoots before they are hardened; and, the more vigorous the plants have grown the preceding summer, the greater is their danger of the frost killing them; but afterwards, as they advance in strength, the covering, which should be of mats, may be removed without risk.

Pteris; a genus of the class Cryptogamia, order Filices. Essential Character. *Fructifications:* in an uninterrupted marginal line. *Involucre:* from the margin of the frond turned in, uninterrupted, separating on the inner side. ——The species are,

* *With simple Fronds.*

1. Pteris Piloselloides. Barren fronds obovate; fertile, lanceolate, longer; shoots creeping.—Native of the East Indies, Japan, and Cochin-china, on rocks and trees.

2. Pteris Lanceolata. Fronds lanceolate, subangular, smooth, fruiting at the tip.—Native of San Domingo.

3. Pteris Angustifolia. Fronds lanceolate, linear, entire, erect, fruiting along the whole edge.—Native of the West Indies.

4. Pteris Lineata. Fronds linear, quite entire, fruiting longitudinally.—Native of St. Domingo.

5. Pteris Tricuspidata. Fronds linear, trifid at the top. —Native of the West Indies.

6. Pteris Furcata. Fronds dichotomous, hispid underneath, fruiting at the tips.—Native of the West Indies.

7. Pteris Quadrifolia. Frond quaternate, roundish, quite entire; shoots creeping.—Native of the East Indies.

** *With pinnate Leaves.*

8. Pteris Arborea. Leaflets pinnatifid; trunk arboreous, prickly.—Native country unknown.

9. Pteris Grandifolia. Pinnas opposite, ovate-linear, acuminate, quite entire. Native of the bogs of Dominica and Martinico.

10. Pteris Nervosa. Pinnas lanceolate, parallel-nerved, entire, the lowest binate.—Native of Japan.

11. Pteris Longifolia. Pinnas linear, repand, cordate at the base.—Native of Jamaica and Dominica, in cool moist places near rivulets.

12. Pteris Denticulata. Lower pinnas semipinnate, lanceolate; the barren ones toothlet-ciliate; the fertile ones quite entire.—Native of Hispaniola.

13. Pteris Vittata. Pinnas linear, straight, rounded at the base.—Native of China, Cochin-china, and Jamaica.

14. Pteris Stipularis. Pinnas linear, sessile; stipules lanceolate.—Native of South America.

15. Pteris Trichomanoides. Pinnas subovate, blunt, repand, hirsute underneath.—Native of the rocks in Dominica and Jamaica, where it is said to be common in the mountains of Liguanee.

16. Pteris Cretica. Pinnas opposite, lanceolate, serrulate, narrowed at the base; the lowest subtripartite. Native of the islands of Candia and Elba.

**** With subbipinnate or branched Fronds*

17. Pteris Pedata. Fronds five-angled, trifoliate; pinnas pinnatifid, the lateral ones two-parted. This little plant seldom rises above four or six inches from the ground; it is beautifully dissected, and of a very singular form, but varies much in its division and appearance.—Native of Jamaica, Dominica, and the Society Isles.

18. Pteris Sinuate. Fronds bipinnatifid; pinnules and sinuses rounded.—Native of Japan.

19. Pteris Aquilina; *Female Fern*, or *Brakes*. Fronds superdecompound; leaflets pinnate; pinnas lanceolate; lower pinnatifid, upper less. The roots are creeping, and when cut obliquely, present a kind of representation of the imperial eagle; hence Linneus called it *Aquilina*. The fronds are annual, springing from a perennial, scaly root, and rise from two to five feet, according to the soil: they are rigid and harsh, of a light green, and spread in a handsome manner. They are called *Brakens* in the north of England.—Native of most parts of Europe, on heaths and in woods. An alkali, which is tolerably pure, may be obtained from the ashes of this plant. The root dried, reduced to a fine powder, and given in doses of half an ounce, is a secret remedy for the tape-worm, and is supposed to be equally efficacious in the destruction of all other worms. The common people, in many parts of England, mix these ashes with water, and form them into balls; these balls are afterwards made hot in the fire, and used to make lye for scouring of linen. This plant certainly forms a very durable thatch, and affords an excellent litter for horses and cows. Where fuel is scarce, it is used to heat ovens, and burn limestone, for it will afford a very intense heat. In the most inhospitable northern climates, bread is actually made from the roots; and even in Japan, the young fronds, before their leaves are displayed, are exposed in the shop windows during the month of May, at which time they are eaten by the natives. The woody root is there also, bruised, soaked in water, boiled, and then, though quite black, eaten by the poorer sort.—This plant may sometimes be eradicated by repeated mowings in summer; but where it is troublesome, burning it is most effectual.

20. Pteris Caudata. Fronds superdecompound; pinnas linear; the lowest pinnate, toothed at the base; the terminating ones very long.—Native of Jamaica and Dominica; in the former of which, according to Browne, it is very common upon open spots in the mountains, where it thrives best in a stiff clay.

21. Pteris Mutilata. Fronds decompound; leaflets pinnate, the lowest semipinnatifid; the terminating ones, and those of the base, very long.—Native of the same islands, and growing like the preceding, only never rising so high: it delights in an open gravelly soil, and is very common on the lower hills of Jamaica.

22. Pteris Atropurpurea. Fronds decompound, pinnate; pinnas lanceolate; the terminating ones longer.—Native of Virginia.

23. Pteris Nigra. Frond tripinnate; leaflets ovate; the terminating one subtrilobate.—Native of China, near Canton.

24. Pteris Arguta. Frond subbipinnate; lower leaflets twice two-parted; pinnas lanceolate, serrate. This is probably a variety of the next species, the difference is so small.—Native of Madeira and Arabia.

25. Pteris Biaurita. Fronds pinnate; pinnas pinnatifid; the lowest two-parted. According to Browne, it rises generally to the height of two feet and a half, or more, and is easily distinguished by the regular division of its lower ribs.—Native of the West Indies and of Cochin-china.

26. Pteris Quadriaurita. Fronds pinnate; pinnas pinnatifid, toothed at the top; the four lower pairs bifid. It is very distinct from the preceding in size, in the serratures and number of the bifid pinnas.—Native of Ceylon.

27. Pteris Semipinnata. Fronds subbipinnate; the lateral leaflets and lowest lobe semipinnatifid.—Native of China and Japan.

28. Pteris Serrulata. Fronds semipinnate, linear, serrulate.—Native of Jamaica.

29. Pteris Heterophylla. Fronds bipinnate; pinnas ovate, oblong, serrate, blunt; the fertile ones quite entire. This is a small, but very elegant species, rising to the height of sixteen or eighteen inches.—Native of Jamaica, in moist shady places.

30. Pteris Lunulata. Frond pinnate; pinnules alternate, petioled, crescent-shaped, striated.—This beautiful Fern appears to have been sent from Bengal.

31. Pteris Esculenta; *Eatable-rooted Brake*. Fronds superdecompound, grooved; leaflets pinnate; pinnas linear, decurrent; the uppermost shorter.—Native of the Society Isles, and of Van Diemen's Land; where the natives eat the roots when better food is scarce: these are creeping, thick, knotty and bristly, and full of a starch-like pith. The fronds are two feet high, much resembling our common brake.

32. Pteris Comans. Fronds pinnate; leaflets pinnatifid; pinnas elongated, lanceolate, at the top attenuated, serrate.—Native of New Zealand.

33. Pteris Rotundifolia. Fronds pinnate, hispid; pinnas subopposite, roundish, obsoletely crenate.—Native of New Zealand.

34. Pteris Humilis. Fronds subbipinnate; leaflets oblong, gashed, subpinnate; the outmost obsoletely crenate, confluent.—Native of New Zealand.

Pterocarpus; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix*: perianth one-leafed, tubular, bell-shaped, five-toothed; teeth acute. *Corolla*: papilionaceous; standard with an oblong claw, roundish, cordate, spreading, convex; wings lanceolate, shorter than the standard; keel short. *Stamina*: filamenta ten, united; antheræ roundish. *Pistil*: germen pedicelled, oblong, compressed; style awl-shaped, stigma simple. *Pericarp*: legume roundish, sickle-shaped, leafy, compressed, varicose, with veiny sides, woody within, not opening; the cells longitudinal. *Seed*: solitary, kidney-shaped, thicker at the base, appendicled at the top. Essential Character. *Calix*: five-toothed. *Capsule*: sickle-shaped, leafy, varicose. *Seeds*: few, solitary.——The species are,

1. Pterocarpus Draco. Leaves pinnate, ovate, pointed;

stipulas oblong, obtuse; legume rounded at the extremity. This is a tree thirty feet high, yielding a red pellucid resin. The bark is thick, outwardly of a ferruginous gray colour: if cut transversely while fresh, it betrays no marks of redness at first, but in a short time is variegated with many blood-red dots, that collect into globules or tears. The tree itself, when cut in different parts, in a short time becomes full of the same bloody drops, which are shining and very clear, and harden in the space of a few minutes, especially if the sun shines hot; and are then collected under the name of Sanguis Draconis, or *Dragon's Blood*. The flowers are yellow, in compound axillary clusters. The bark, wood, and leaves, have an astringent taste; the bark of the trunk and root is cut into pieces, and used by the inhabitants of the West Indies for cleaning their teeth. The resin was formerly sent from Carthagena into Spain, but having fallen into disuse, is no longer gathered for exportation.—Native of South America and the West Indies.

2. Pterocarpus Lunatus. Leaves pinnate; spines stipular; fruits cresent-shaped. A rigid shrub, or tree, with a pair of strong hooked spines at the base of each leaf; panicle terminal, downy; flowers white.—Native of South America.

3. Pterocarpus Santalinus. Leaves ternate, roundish, retuse, very smooth; petals crenate, waved. This is a very lofty tree, having a bark like the Alder, and alternate branches. It is the true *Santalum Rubrum*, which Kœnig first detected in the East Indies. The wood is dark-red with black veins, heavy, close, capable of a good polish, and sinking in water. The sap of this tree, like that of the first species, yields one sort of Dragon's blood. Many of the red Indian woods transude a blood-red juice through the clefts of the bark, which also hardens into resin, not differing from that called Dragon's Blood, which is therefore to be collected from several trees, and from this among others; see *Calamus*, *Rotang*, *Dalbergia*, and *Dracœna*. It is, however, chiefly obtained from the first of these trees; the fruit of which is exposed to the steam of boiling water, or boiled; and the strained decoction inspissated, drying in with it the leaves of some reed. The best kind breaks smooth, is of a dark red colour, and, when powdered, changes to crimson: it readily melts and inflames, totally dissolves in pure spirit, and is soluble in expressed oils, but not in water. It has no smell, but a warm and pungent taste, and was formerly employed in hæmorrhages and alvine fluxes, but is now rarely used internally.

4. Pterocarpus Ecastaphyllum. Leaves simple, ovate, acuminate, silky underneath. This is a shrub or small tree, with a branched even stem, and spreading even branches; branches flexuose, round, pubescent, villose.—Native of the West Indies; found in swampy places about Kingston in Jamaica.

5. Pterocarpus Marsupium. Leaves pinnate, elliptical, emarginate; stipules none; clusters terminal, thrice compound. A large tree, the wood of a yellowish orange colour, hard but not hoary; flowers copious, white, with a tinge of yellow.—Native of the Circar mountains of Coromandel.

6. Pterocarpus Rohrii. Leaves pinnate; stipules none; fruits roundish. This is a tree with smooth round branches, covered with a dusky ash-coloured bark; flowers drooping.—Native of South America.

Pteronia; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common imbricate; scales lanceolate, keeled, acuminate. *Corolla:* compound uniform; corollets hermaphrodite, tubular, numerous, equal; proper one-petalled, funnel-form; border five-cleft, acute. *Stamina:* filamenta five, capillary, very short, antheræ cylindrical, tubular. *Pistil:* germen oblong; style filiform, the length of the stamina; stigma bifid. *Pericarp.* none; calix unchanged. *Seeds:* solitary, oblong, compressed; down sessile, subplumose, with subpilose rays. *Receptacle:* chaffy, flattish; chaffs many, parted into bristles, shorter than the seeds. Essential Character. *Receptacle;* with many-parted bristles. *Down:* subplumose. *Calix:* imbricate.—The habit of these plants is singular and peculiar, but some of the species having a naked receptacle, ought rather to be placed in the genus *Chrysocoma:* it follows at least that a new Generic Character should be constructed for Pteronia, or the natural genus torn asunder.——A genus of rather humble rigid shrubs, consisting, according to Willdenow, of twenty-six species, all natives of the Cape; of which the following are given as a specimen:

1. Pteronia Camphorata; *Aromatic Pteronia.* Leaves scattered, ciliate at the base; calix scales finely serrated. Stem much branched, about a yard high; flowers terminal, yellow, solitary. It blossoms from June to September, requiring the shelter of a greenhouse in winter.

2. Pteronia Oppositifolia; *Forked Pteronia.* Leaves opposite; branches dichotomous, divaricating. This is a small naked shrub; leaves small, ovate lanceolate; flowers terminal, sessile, yellow. It flowers in July.

3. Pteronia Stricta; *Cluster-flowered Pteronia.* Leaves scattered and in bundles, filiform, subciliate at the base; calicine leaflets entire; hollows of the receptacle many-parted, setaceous.

4. Pteronia Hirsuta; *Hairy Pteronia.* Leaves lanceolate, spreading, hairy; stem procumbent; calicine scales entire.

5. Pteronia Glabrata; *Smooth Pteronia.* Leaves lanceolate, smooth; calicine scales ovate, membranaceous.

6. Pteronia Inflexa. Leaves ovate, hairy; calicine scales subarticulate, membranaceous; peduncle bent in.

7. Pteronia Scariosa. Branches spiny; calices scariose; leaves oval.

8. Pteronia Glomerata. Leaves ovate, three-sided, smooth; stem four-cornered.

9. Pteronia Cinerea. Leaves oblong, tomentose; calicine scales ovate, membranaceous.

10. Pteronia Villosa. Leaves lanceolate, blunt, hairy; calicine scales ovate, membranaceous.

11. Pteronia Membranacea. Leaves ovate, mealy, tomentose; calicine scales awl-shaped, scariose at the edge.

12. Pteronia Spinosa; *Thorny Pteronia.* Leaves awl-shaped, spinescent, pungent. Stem woody, round, much branched; leaves remote, alternate, sessile, spreading; flowers about four, sessile, axillary, near the tops of the branches.

13. Pteronia Minuta. Leaves linear, wandering; flowers axillary.

14. Pteronia Fasciculata. Flowers in bundles, each of one floret only.

Pterospermum: a genus of the class Monadelphia, order Dodecandria.—Generic Character. *Calix:* perianth five-parted; leaflets coriaceous, oblong, reflex. *Corolla:* petals five, oblong, spreading. *Stamina:* filamenta fifteen, linear, united at the base into a tube; antheræ oblong, erect; ligules five, longer, coloured, almost upright, the length of the corolla, each between every three stamina. *Pistil:* germen roundish, pedicelled; style cylindrical, the length of the stamina; stigma thickish. *Pericarp:* capsule pedicelled, woody, ovate, five-celled, the cells two-valved. *Seeds:* numerous, oblong, compressed, with a membranaceous wing. Essential Character. *Calix:* simple, five-parted. *Corolla:* five-petalled; filamenta fifteen, with five ligules, one between every three filamenta. *Capsule:* five-celled, with the cells two-valved. *Seeds:* many, winged.——The species are,

1. Pterospermum Suberifolium. Leaves ovate, repand. A handsome plant, with erect branches, covered with a rusty down; flowers axillary, at the summits of the branches, one, two, or three together, white. The substance of the leaves is the same with that of the Ilex or Holm Oak.—Native of the East Indies; flowering in September and October.

2. Pterospermum Acerifolium. Leaves cordate, repand. This is much larger than the preceding species, but very similar in habit. The bark and underside of the leaves are covered with a white wool: the flowers are terminal, white, and fragrant. It flowers from July to September.—Native of the East Indies.

Pulmonaria; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-toothed, prismatic, pentagonal, permanent. *Corolla:* one-petalled, funnel-form; tube cylindrical, the length of the calix; border half five-cleft, blunt, from upright spreading; throat pervious. *Stamina:* filamenta five, in the throat, very short; antheræ erect, converging. *Pistil:* germina four; style filiform, shorter than the calix; stigma blunt, emarginate. *Pericarp:* none; calix unchanged, fostering the seeds at bottom. *Seeds:* four, roundish, blunt. Essential Character. *Calix:* prismatic, five-cornered. *Corolla:* funnel-form, with an open throat.——The species are,

1. Pulmonaria Angustifolia; *Narrow-leaved Lungwort.* Leaves hirsute; stem-leaves oblong, lanceolate, embracing; root-leaves elliptic. Root perennial, tuberous, dark, with thick fibres. The stalks rise a foot high, and have narrow leaves on them, of the same shape as those below, but smaller and almost embracing. The flowers are produced in bunches on the top of the stalks, like the others; the corollas are red before they expand, but when they are fully blown are of a most beautiful blue colour. It varies with a white flower: there is also a variety, the leaves of which are so much spotted with white, that they appear as if they were incrusted with sugarcandy; the variety occurs on the mountains of Switzerland.—Native of woods in Sweden, Denmark, Germany, Switzerland, Austria, Hungary, France, and England, flowering in May or June.

2. Pulmonaria Officinalis; *Common Lungwort.* Leaves hirsute; stem-leaves ovate, oblong; root-leaves subcordate. Root perennial, fibrous; corolla blue, before it expands red; varying as the preceding with white flowers.—Native of woods and shady places all over Europe, flowering from March to May. In England, though common in all gardens, it is often found also in its wild state, as at Thurleigh and Milton Ernys in Bedfordshire; in Cliff wood, six miles west of Darlington; in the New Forest; in several woods in Kent; and between Croydon and Godston in Surry. The leaves of this plant, which are the part recommended in medicine, have no peculiar smell, but in their recent state manifest a slightly astringent and mucilaginous taste; hence they are supposed to be demulcent and pectoral, and have been used in hemoptoes, tickling coughs, and catarrhal defluxions upon the lungs. The name *Pulmonaria* seems to have arisen from the speckled appearance of the leaves, resembling that of the lungs, rather than from any quality which experience has discovered in them suitable to pulmonary complaints. This, as also the first and fifth species, having perennial roots, may be cultivated by parting their roots either in the spring or autumn; but if the ground into which they are planted be moist, it should be done in the spring, but otherwise the autumn is preferable, that the plants may be well rooted before the dry weather returns; and also that they may flower stronger. The soil in which they are planted should not be rich, but rather a fresh, light, sandy ground, in which they will thrive much better than in a richer soil, as in that they often rot during winter. They should have a shady situation, and will thrive best in a most soil; for in a hot dry soil they burn and decay in summer, unless plentifully watered in dry weather. All the early sorts are better transplanted and parted in autumn, that they may flower strong in the following spring. They may also be propagated by seeds sown in autumn soon after they are ripe, where they are to remain; for the seedling plants do not succeed so well when they are transplanted. The common sorts will come up from scattered seeds

3. Pulmonaria Suffruticosa; *Shrubby Lungwort.* Leaves linear, rugged; calices awl-shaped, five-parted. Stems woody at bottom, perennial with the leaves; flowers blue.—Found on the mountains of Italy.

4. Pulmonaria Paniculata; *Panicled Lungwort.* Calices abbreviated, five-parted, hispid; leaves ovate-oblong, acuminate, somewhat hairy. It flowers in June, and varies from blue to white flowers.—Native of Hudson's Bay.

5. Pulmonaria Virginica; *Virginian Lungwort.* Calices abbreviated, very smooth; leaves lanceolate, bluntish. Root perennial, thick, fleshy, sending out many small fibres; stalks a foot and half high, dividing at the top into several short branches. Every small branch at the top of the stalk is terminated by a cluster of drooping flowers, each standing upon a separate short peduncle: the most common colour is blue, but there are some purple, others red, and some white: they appear in April, and, if they have a shady situation, will continue in beauty great part of May, and are sometimes followed by seeds in England. The leaves and stalks entirely decay in August, and the roots remain naked till the following spring. In favourable seasons, the flower-garden owes much of its gaiety to this elegant plant, and at a time when ornament is most desirable.—Native of North America, from Pennsylvania to Carolina, on the gravelly shores of rivers. It should not be placed in a very moist soil, for the roots run deep in the ground, and would rot with much moisture. It requires a pure air, and to be sheltered from the cold easterly April winds, which are very injurious to it while in flower.

6. Pulmonaria Sibirica; *Siberian Lungwort.* Calices abbreviated; root-leaves cordate. Root perennial. This is a middle sort, between the preceding and following species.—Native of Siberia.

7. Pulmonaria Maritima; *Sea Lungwort.* Calix abbreviated; leaves ovate, glaucous; stem branched, procumbent. Root perennial or biennial, woody, blackish; flowers racemose, terminal, of a beautiful purplish-blue. The whole plant turns black in drying, unless it be first immersed in fresh water for twenty-four hours. Dr. Blair relates, that he was credibly informed by a gentleman, that a farmer in a time of scarcity, being straitened for bread, taking this plant for Colewort, to which it is not unlike in colour, ordered a dish of it to be boiled, and gave it to his wife and children, with the servants in his family; all of them became very sick, some vomited excessively, others slept two or three days without intermission, and one or two of them died. It is possible however that the farmer was mistaken in the plant, though it is prudent to state the circumstance, that it may be examined if poisonous.—It is a native of Norway, Iceland, and Great Britain; being a very great ornament to the sandy sea-coasts in Scotland and the north of England, where it flowers in July. The roots strike deeply into the sand, or among pebbles: it has been noticed at the following places, at Scrammerston Mill, between the Salt Pans and Berwick; near Whitehaven and Maryport, in Cumberland; against Biggler in the isle of Walney, Lancashire; near Tre-

farthen in Anglesea; and by the river Uyfni in the way from Dinardindle to Clynog in Caernarvonshire; in several places along the Frith of Forth; on the coast of Fife, near St. Andrews; in the isle of Bute; in Arran, at Loch Ransa; at Lamlash, at Icolm Rill, and at Glen Elgin, Inverness-shire; also at the ferry on the sea-shore at Inverness; about Aberdeen; and on the western shore of the isle of Walney.—Gather the seeds as they ripen; sow them early in September or the ensuing February, in a pot of earth composed of three parts sea-sand or common sand, and one part rotten cow-dung finely sifted. In about six weeks or two months from the February sowing, these seeds will vegetate, and in the autumn the plants will be fit to transplant into separate pots, and most of them will flower the next year. Snails and slugs are uncommonly fond of this plant, which they will soon destroy, if it be placed in the open border: set them therefore with the green-house plants, and treat them in the same manner. Let as little water as possible drop upon the leaves, for every drop leaves an unpleasant mark.

Pultenæa; a genus of the class Decandria, order Monogynia.—Essential Character. *Calix:* five-toothed, two-lipped, with an appendage on each side. *Corolla:* papilionaceous; the wings shorter than the standard. *Germen:* sessile. *Style:* awl-shaped. *Stigma:* acute. *Legume:* of one cell, with two seeds, their appendages lobed and knotched. Eleven species have been described, all natives of New South Wales; of which the following are a specimen:

1. Pultenæa Stipularis. With linear, mucronated, subciliated leaves, and solitary, two-nerved, lacerated stipules. Stem shrubby, variously branched, and round. The wood is hard and whitish, the bark brown. The flowers are of a golden yellow, about twenty or more, in a round head among spreading leaves; corolla five-petalled.

2. Pultenæa Paleaeea. With linear, mucronated, smooth leaves, terminal head, and oblong, acuminate, toothed bractes, longer than the flower.

3. Pultenæa Linophylla. With linear, obtuse, mucronated, strigose leaves, few-flowered terminal heads, and scariose bifid bractes much shorter than the calix. This is a shrub six feet high, upright; stem branching; flowers of a pale orange colour.

4. Pultenæa Flexilis. Leaves linear, somewhat obovate, flat, with a small point, quite smooth, as well as the calix; stipules longer than footstalks; flowers axillary. It flowers in the green-house in spring; and is an elegant, slender, rather drooping shrub, with shining leaves, dark green, and copper-coloured branches.

5. Pultenæa Villosa. With oblong hairy leaves, solitary axillary flowers, and villose stem. A dense bushy shrub, with numerous short leafy branches, and copious axillary solitary yellow flowers

6. Pultenæa Daphnoides. With smooth, obovated, mucronated leaves, and terminal headed flowers. The flowers are large, and yellow, with a purple keel.

Pumpion, Pumpkin. See *Cucurbita.*

Punica; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-cleft, acute, coloured, permanent. *Corolla:* petals five, roundish, from upright spreading, inserted into the calix. *Stamina:* filamenta numerous, capillary, shorter than the calix, and inserted into it; antheræ somewhat oblong. *Pistil:* germen inferior, roundish; style simple, the length of the stamina; stigma headed. *Pericarp:* pome subglobular, large, crowned with the calix, divided into two chambers by a transverse partition; the upper having about nine, the lower about three cells; partitions membranaceous. *Seeds:* very many, angular, succulent; receptacle fleshy, pitted, dividing each cell of the pericarp two ways. Essential Character. *Calix:* five-cleft, superior. *Petals:* five. *Pome:* many-celled. *Seeds:* numerous, pulpy.—The species are,

1. Punica Granatum; *Common Pomegranate Tree.* Leaves lanceolate; stem arboreous. This tree rises with a woody stem eighteen or twenty feet high, sending out branches the whole length, which likewise put out many slender twigs, rendering it very thick and bushy. The flowers come out at the ends of the branches, singly or three or four together; frequently one of the largest terminates the branch; and immediately under that, are two or three smaller buds, which continue a succession of flowers for some months; the calix is very thick and fleshy, and of a fine red colour; the petals are scarlet. Fruit is as big as an orange, of a tawny brown, with a thick astringent coat, containing abundance of seeds, enveloped in a very juicy crimson coat, whose flavour in a wild state is a pure very strong acid, but when cultivated, sweet, and highly grateful. The varieties are, 1. The Wild Pomegranate, with single and double flowers. 2. The Sweet Pomegranate. 3. The Small-flowering Pomegranate, with single and double flowers. 4. The Pomegranate with striped flowers. The rind of the fruit is powerfully astringent, and has long been successfully employed externally and internally for gargles and in diarrhœa. The dose in substance is from half a drachm to a drachm; in infusion or decoction, half an ounce. Both are strongly astringent: a decoction of them stops bleedings and purgings of all kinds, and is good in the whites. The flowers of the Pomegranate-tree are kept in the shops, under the title of Balustines; and are given in powder or decoction, to check purgings, bloody stools, and immoderate menses. A strong infusion of them cures ulcers in the mouth and throat, and fastens loose teeth.—Native of Spain, Portugal, Italy, Barbary, Persia, Japan, China, and Cochin-china. This tree is supposed to have been introduced into the West Indies from Europe: the fruit there is larger and better flavoured. The single Pomegranate is now rather common in the English gardens, where it was formerly nursed up in cases, and preserved with great care in green-houses along with the double-flowering kind, though they are each hardy enough to withstand the severest cold of our climate in the open air; and if planted against warm walls in a good situation, the first will often produce fruit, which in the warm seasons will ripen tolerably well; but as these fruits do not ripen till late in the autumn, they are seldom well-tasted in England, and on this account the double-flowered sort is usually preferred. All these plants may be easily propagated, by laying down their branches in the spring, which in one year's time will take good root, and may then be transplanted where they are intended to remain. The best season for transplanting these trees is spring, just before they begin to shoot; they should have a strong rich soil, in which they flower much better, and produce more fruit than if planted on a dry poor ground; but in order to obtain those in plenty, there should be care taken in the pruning of these trees, for the want of which they are often crowded with small shoots: to prevent this evil, observe, that as the flowers of this tree always proceed from the extremity of the branches, which are produced in the same year, that circumstance itself points out the necessity of cutting out all weak branches of the former year, and that the stronger shoots should be shortened in proportion to their strength, in order to obtain new shoots in every part of the tree. The branches may be laid in against the wall about four or five inches asunder; for as their leaves are small, there is no necessity to allow them a greater distance. The best

The Double-flowering Pomegranate.

The Fruit-bearing Pomegranate.

F. Hilliard sc.

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CALIFORNIA

time for this work is about Michaelmas, or a little later, according to the mildness of the season; for if they are left until the spring before they are pruned, they seldom put out their shoots so early, and the earlier they come out, the sooner the flowers will appear, which is of great consequence where the fruit is desired. In summer they will require no other dressing, but to cut off all vigorous shoots which grow from the wall, and never produce flowers, for it is the middling shoots only that are fruitful. When the fruit is formed, the branches on which they grow should be fastened to the wall to support them; otherwise the weight of the fruit, when grown large, will be apt to break them down. Though after all possible care and precaution the fruit of this tree seldom arrives to any perfection in this country, so as to render it valuable, yet for the beauty of its scarlet-coloured flowers, together with the variety of its fruit, there should be one good tree planted in every good garden, since the culture they require is chiefly this, to plant them in a rich strong soil and warm situation. Upon some trees favoured with these two advantages, great quantities of full-sized fruit have rewarded the gardener's toils; but they are seldom well-flavoured, though they make a very handsome appearance upon the trees. The double-flowering kind is the most esteemed in this country, for the sake of its large fine double flowers, which are of a most beautiful scarlet colour; and if the trees are supplied with nourishment, will continue to produce flowers for two months successively, which render it one of the most valuable flowering trees yet known. It must be pruned and managed in the same manner as has been already directed for the fruit-bearing kind: but it will produce a greater abundance of its beautiful flowers by grafting it upon stocks of the single kind, which will check the luxuriancy of the trees, and cause them to produce flowers upon almost every shoot; so that a low tree planted in the open air, being full of flowers, has made a most elegant appearance.

2. Punica Nana; *Dwarf Pomegranate Tree.* Leaves linear; stem shrubby. It seldom rises above five or six feet high. The flowers are much smaller than those of the common sort; the leaves are shorter and narrower; and the fruit is not larger than a nutmeg, and has little flavour. In the West Indies, where it is a native, and is planted for hedges, it continues flowering great part of the year. It may be propagated by layers like the former, but must be planted in pots filled with rich earth, and preserved in a green-house. In the summer, when the flowers begin to appear, if the plants are exposed to the open air, the buds will fall off without opening; they should be placed therefore in an airy glass-case, and a large share of air should be given them every day in warm weather. By this treatment they may be continued in flower upwards of three months, and will make a fine show.

Purging Nut. See *Jatropha Gossipifolia.*

Purslane. See *Portulacca.*

Purslane, Sea. See *Atriplex Halimus.*

Purslane Tree. See *Portulacaria.*

Pyrola; a genus of the class Decandria, order Monogynia.—Generic Character *Calix:* perianth five-parted, very small, permanent. *Corolla:* petals five, roundish, concave, spreading. *Stamina:* filamenta ten, awl-shaped, shorter than the corolla; antheræ nodding, large, two-horned upwards. *Pistil:* germen roundish, angular; style filiform, longer than the stamina, permanent, various in length and direction, sometimes scarcely any; stigma thickish, variously shaped. *Pericarp:* capsule roundish, depressed, five-cornered, five-celled, five-valved, opening at the corners; partitions contracted. *Seeds:* numerous, chaffy. Essential Character. *Calix:* five-parted. *Petals:* five. *Capsule:* superior, five-celled, opening at the corners, many-seeded. *Antheræ:* with two pores.——The species are,

1. Pyrola Rotundifolia; *Round-leaved Winter-green.* Stamina ascending; pistil declining; raceme many-flowered. Root creeping, perennial, scaly; stems angular, short, leafy; leaves four or five, on bordered smooth footstalks, roundish or elliptical, smooth, shining, veined; flower-stalks terminal, solitary, a span long, terminating in a loose cluster of fragrant white flowers; seeds very numerous and very small, consisting of a globular nucleus, within an arillus shaped like saw-dust. The Germans use this plant in all their wound-drinks, and in many of their ointments and plasters. A decoction of the leaves, with the addition of a little cinnamon and red wine, restrains overflowings of the menses, and cures bloody stools, ulcers of the bladder, and bloody urine, if Hill's testimony be correct.—Native of the north of Europe, Germany, Switzerland, the south of France, and the north of Italy; in Great Britain it is not common, but flowers in July, and has been found at Bradwell common, near Yarmouth; and in some woods of Scotland.—The plants of this genus are all very difficult to cultivate in gardens; for as they grow on very cold hills, and in mossy moorish soil, they seldom live long when removed to a better soil and a warm situation. The best time to transplant them into gardens is about Michaelmas, when the roots should be taken up with balls of earth to them, and planted in a shady situation and on a moist undunged soil, where they should be frequently watered in dry weather. Or they may be planted in pots filled with the same earth in which they grew, placed in a shady situation in pans of water, or at least constantly watered in dry weather.

2. Pyrola Minor; *Lesser Winter-green.* Stamina and pistilla straight; flowers in racemes, dispersed. This has the habit of the preceding, but is smaller, and the leaves more elliptical: the flowers are numerous, drooping, white, with more or less of a pink tinge.—Native of the north of Europe. Found in Scotland, and in the north of Yorkshire; in Stokenchurch woods, Oxfordshire; at Whipsnal, and in woods about Luton, in Bedfordshire; and near Tring in Hertfordshire.

3. Pyrola Secunda; *Notch-leaved Winter-green.* Leaves ovate-acute, serrated; raceme one-sided; roots small and fibrous. The stems are long and trailing; and the flowers greenish-white.—Native of woods in the north of Europe, and even in Switzerland, France, and Italy. It is found in Fir and Beech woods in the Highlands of Scotland; in Yorkshire, and in Westmoreland.

4. Pyrola Umbellata; *Umbelled Winter-green.* Leaves obovate, serrated; peduncles in a sort of umbel. Root very long; stem upright or a little decumbent at the base, naked at the bottom, hard and woody, roughened here and there with tubercles.—Native of Europe, Austria, and North America, where it is found with its congeners in Fir woods, especially those which are old, shady, and deserted. They all love, as Linneus remarks, a deep shade and a rocky barren soil.

5. Pyrola Maculata; *Spotted-leaved Winter-green.* Leaves ovato-lanceolate, with tooth-like serratures; peduncles two-flowered. Root woody; stems two or three, woody, a foot and half high. The flowers are produced at the end of the stalk on slender peduncles about three inches long, each sustaining two small pale-coloured flowers at the top: they appear in June.—Found in shady gravelly woods from Canada to Carolina.

6. Pyrola Uniflora; *One-flowered Winter-green.* Peduncle one-flowered. The long branched roots of this plant run deep among Moss in moist alpine woods. The peduncle is

solitary, longer than the leaves, upright, bearing one flower, of a white or slightly reddish colour, larger than in the other species, of great elegance, possessing all the fragrance of the Lily of the Valley.—Native of woods in the northern parts of Europe, in Germany, Carniola, and even the south of France, and the north of Italy. It has been found in Fir woods near Brodic-house in Moray; and on the islands of Harris and Bernera, among the Hebrides.—This species may be distinguished by the stigma, which in the first species is incrassated, five-toothed, with the teeth upright and acute; which this exactly resembles, except in being larger and peltate.

7. Pyrola Asarifolia. Leaves kidney-shaped; flowers yellowish-green.—Grows in Canada, and on the mountains of Pennsylvania, in Beech-woods.

Pyrostria; a genus of the class Tetrandria, order Monogynia.—Essential Character. *Calix:* very small, four-toothed. *Corolla:* bell-shaped, four-cleft, tomentose in the throat. *Stamina:* four. *Pistil:* germen turbinate, inferior; style short, cylindrical; stigma capitate. *Pericarp:* drupe pear-shaped, inferior, small, eight-streaked, not crowned. *Seed:* nuts eight, one-seeded.——The only known species is,

1. Pyrostria Salicifolia. A shrub, with round, smooth, grayish branches, and opposite-stalked leaves, which are bluntish, attenuated at the base, quite entire.—Native of the Mauritius.

Pyrus; a genus of the class Icosandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, concave, five-cleft, permanent; segments spreading. *Corolla:* petals five, roundish, concave, large, inserted into the calix. *Stamina:* filamenta twenty, awl-shaped, shorter than the corolla, inserted into the calix; antheræ simple, roundish. *Pistil:* germen inferior, roundish; styles five, filiform, the length of the stamina; stigmas simple. *Pericarp:* pome roundish, umbilicate, fleshy, with five membranaceous cells. *Seeds:* mostly two in each cell, oblong, blunt, acuminate at the base, convex on one side, flat on the other. Essential Character. *Calix:* five-cleft. *Petals:* five. *Pome:* inferior, five-celled. *Seeds:* two in each cell.——The species are,

1. Pyrus Communis; *Common Pear Tree.* Leaves ovate, serrate, finally smooth; flower-stalks corymbose; fruit elongated at the base. This grows to a lofty tree, with upright branches, but the twigs or branchlets hanging down: flowers in terminating villose corymbs; corollas snow-white. Its fruit was familiar to the ancients, and has long been a great favourite with our French neighbours. As it is a native of Europe, it was unquestionably known to our remote ancestors, who, like most of their descendants, appear to have preferred the Apple. The Wild Pear, supposed to be the mother of all the orchard and garden varieties, is thorny; the stipules are setaceous, white, or reddish, deciduous; the peduncles alternate; the calix clothed with a ferruginous wool. The wood of the Pear-tree is light, smooth, and compact; it is used by turners, and to make joiner's tools, and for common picture frames, being stained black. The leaves afford a yellow dye, and may be used to give a green to blued cloths. The fermented juice is called Perry, which, when made from the Squash, Oldfield, and Barland Pears, is esteemed little inferior to wine.—Mr. Miller has selected eighty varieties of those Pears which are most esteemed; and from his list we shall again select the most approved kinds, in as large a number as our limited space will admit. 1. The Musk, or, as it is commonly called, the Supreme Pear, is generally produced in large clusters, and has a musky juice. If gathered before it is ripe, about the middle of July, it is a good fruit, but will only keep for a few days. 2. The Red Muscadelle, or, as the French call it, the Fairest, is an excellent large early Pear, the skin of which is of a fine yellow colour, beautifully striped with red when ripe. The flesh is half melted, and has a rich flavour, if not suffered to hang on the tree till it becomes mealy. It sometimes produces two crops of fruit in a year; the first ripening at the end of July, and the second in September, though the last crop is seldom well-tasted. 3. The Jargonelle, or, as the French call it, Cuisso Madame, is a very long fruit, of a russet-green colour from the sun, but towards it inclining to an iron-colour. It is one of the best early summer Pears yet known; it has a rich musky flavour; and is ripe at the beginning of August. 4. The Windsor Pear is good for nothing if suffered to hang two or three days after it is ripe. 5. That which the French gardeners call the Jargonelle, is apt to become mealy, but being a plentiful bearer, is much propagated for the London markets, that being the grand requisite in the eyes of the growers. 6. The Skinless Pear, is a middle-sized fruit, of a long shape: the flesh is melting, and full of a rich sugary juice. It ripens in the middle of August. 7. The Rose Pear, is a short fruit, shaped like the Onion, but much larger, of a yellowish-green colour. The flesh is breaking, and the juice musky: it ripens at the end of August. 8. The Perfumed Pear, is a middle-sized round fruit. The flesh is melting but dry, and has a perfumed flavour. It ripens at the end of August. 9. The summer Boncrêtien, is a large oblong fruit, the skin of which is smooth and thin; the side next the sun is of a beautiful red colour, but the other side of a whitish-green. The flesh is between breaking and tender, and very full of juice. It ripens in the beginning of September. 10. The Russelet Pear, is large and oblong: the skin is brown, and of a dark red colour next the sun; the flesh is soft and tender, without much cover. Its juice is agreeably perfumed, if gathered before it be over-ripe. It produces larger fruit on an espalier than on standard-trees, and ripens in the middle of September. 11. Prince's Pear, is a small roundish fruit, of a bright red colour next the sun, but a yellowish colour on the opposite side. The flesh is between breaking and melting, and the juice very highly flavoured. This is a great bearer, ripening its fruit in the middle of September. Its fruit will keep good for a fortnight. 12. The Great Mouth Water Pear, is a large round fruit, with a smooth green skin; the stalk is short and thick; the flesh melting and full of juice: it should be gathered before it is quite ripe, or else it will grow mealy. It ripens in the middle of September. 13. The Summer Bergamot Pear, called by some Hamden's Bergamot, is a roundish large flat Pear, of a greenish-yellow colour, hollowed a little at both ends like an Apple. The flesh is melting, and the juice highly perfumed: it ripens about the middle of September. 14. The Autumn Bergamot, is a smaller Pear than the former, but nearly of the same shape; the skin is of a yellowish-green, but changes to a faint red on the side next the sun; the flesh is melting, and its juice richly perfumed. It is a great bearer, ripens at the end of September, and is one of the best Pears of the season. 15. The Swiss Bergamot, is somewhat rounder than either of the two former. The flesh is melting and full of juice, but not so highly perfumed as either of the former. It ripens in September. 16. The Red Butter Pear, is very melting, and full of a rich sugary juice. It ripens at the beginning of October, and when gathered from the tree is one of the very best sort of Pears we have. It is a large long fruit, generally of a brown colour. There is also the Gray Butter Pear, and the Green Butter Pear, but these different names are occasioned by the different colours of the same sort of Pear, owing either to the difference of soil and situation, or to the stock; those upon free-stocks

generally assuming a browner colour than those upon Quince-stocks, which has led some to suppose them to be different fruits, though in reality they are the same. 17. The White and Gray Monsieur John Pear, are undoubtedly the same fruit varied. This Pear, when grafted on a free-stock, and planted on a middling soil, neither too wet nor over dry, is an excellent autumn Pear; but when it is grafted on a Quince-stock, it is apt to be very stony; or on a very dry soil, will yield only small and worthless fruit. This, however, when rightly managed, is one of the best Pears we have. It ripens at the end of October, and will continue good near a month. 18. The Flowered Muscat Pear, is a very excellent kind, having a tender and delicately-flavoured flesh. It ripens at the end of October, at the same time with the (19.) Vine Pear, which ought to be gathered before it is ripe, and has a very melting flesh, full of a very clammy juice. 20. The Rousseline Pear, is very tender and delicate, with an agreeable perfumed sweet juice. It ripens at the end of October. 21. The Colmar Pear has a green skin, with a few yellowish spots, but is sometimes a little coloured on the side next the sun. The flesh is very tender, and the juice is greatly sugared. It is in eating at the latter end of December, but will often keep good till the end of January, and is esteemed one of the best fruits of that season. 22. The Winter Thorn Pear, is a large fine fruit, nearly of a pyramidal figure: the skin is smooth, and of a pale green colour, inclining to yellow as it ripens. The flesh is melting and buttery; the juice is very sweet, and, in a dry season, is highly perfumed; but when it is planted on a moist soil, or the season proves wet, it is very insipid, so that it ought never to be planted on a strong soil. It ripens at the end of December, and will continue good two months. 23. The St. Germain Pear, is very sweet, when the tree is planted on a warm dry soil; but when planted on a very moist soil, the juice is apt to be very harsh and austere, which renders it less esteemed by some persons; though in general it is greatly valued, and is in eating from December till February. 24. The Pound Pear, or, as it is generally called in England, Parkinson's Warden, or the Black Pear of Worcester, is a very large fruit, often weighing more than a pound. It is an excellent sort for baking and stewing, and is in season from December to March. 25. The Winter Citron Pear, or, as it is sometimes called, the Musk Orange Pear, is very like an Orange or Citron in shape and colour. It bakes well, and is in season from December to March. 26. The Winter Russelet: the colour of this is a greenish-yellow inclining to brown; the stalk is long and slender, and the flesh buttery and melting, generally filled with a very sweet juice; but the skin often contains an austere flavour, so that it requires paring to render it agreeable to most palates. It is in season in January and February. 27. The Franc Real Pear, or the Golden End of Winter, is almost of a globular figure; the skin is yellow spotted with red, and the stalk short; the flesh is rather dry and apt to be stony, but it bakes exceedingly well, and continues good from January till March. 28. The Double-flowering Pear, derives its name from the double range of petals or leaves. It is a large short Pear, the stalk is long and straight, the skin very smooth and yellowish, next the sun generally of a fine red or purple colour. It is the best Pear known for baking or composts, and is good from February to May. 29. The Union Pear, called also Dr. Uvedale's St. Germain; it is a very long Pear, of a deep green colour, but the side next the sun sometimes changes to a red as it ripens. It is not fit for eating, but bakes very well; and being a great bearer, and a very large fruit, deserves a place in every good collection. It is in season from Christmas to April. 30. The Pear d'Auch, introduced by the late duke of Northumberland; it much resembles the Colmar, but is fuller towards the stalk. It is in eating from Christmas to April, and is, without exception, the best of all the winter Pears. 31. The Swan's Egg Pear, is of a middle size, shaped like an egg, of a green colour, thinly covered with brown: the flesh is melting, and full of a pleasant musky juice. It comes into eating in November. It is healthy, and bears well, as a standard, or in any other way.—There are innumerable other sorts of Pears, which are still continued in old gardens; but as those above-mentioned are selected from the best sorts known, it would be needless to enumerate inferior kinds, because every one who intends to plant fruit-trees, would prefer those which are most valued, the expense and trouble of a bad sort being the same as a good one.—*Propagation and Culture.* Pears are propagated by budding or grafting them upon stocks of their own kind, which are commonly called free-stocks; or upon Quince-stocks, or White Thorn, upon all which they will take; though the last sort of stock is suitable only for moderate growers. Quince-stocks are generally used in the nursery for all sorts of Pears which are designed for dwarfs or walls, in order to check the luxuriancy of their growth, so that they may be kept in compass better than upon free-stocks. But against the general use of these stocks, for all sorts of Pears indifferently, there are very great objections: 1. Because some sorts of Pears will not thrive upon these stocks, but in two or three years decay, or only just remain alive. 2. Most of the sorts of hard-breaking Pears are rendered stony and good for little; so that whenever any of them are thus injudiciously raised, the fruit, allthough the kind be ever so good, is condemned as good for nothing, when the fault is entirely owing to the stock on which it was grafted. On the contrary, most melting buttery Pears are greatly improved by being upon Quince-stocks, provided they are planted on a strong soil; but if the ground be very dry and gravelly, no sort of Pear will do well upon Quince-stocks. For the raising, budding, and grafting of these stocks, see *Nursery* and *Inoculating*. The distance at which Pear-trees should be planted, either against walls or espaliers, must not be less than forty feet; for if they have not room to spread, it will be impossible to keep them in good order, especially free-stocks, which shoot the more they are pruned.—The next thing, after being furnished with proper trees, is preparing the ground to receive them: in doing of which, there should be great regard had to the nature of the soil where the trees are to grow; for if it be a strong stiff land, and subject to wet in the winter, the borders should be raised as much as possible above the level of the ground; and if under the good soil there be a sufficient quantity of lime, rubbish, or stones, laid to prevent the roots from running downwards, it will be very beneficial to the trees. The borders should not be less than eight feet broad; but if twelve feet, all the better. These borders may be planted with such esculent plants as do not grow large, nor meet together on the surface, and whose roots do not grow deep, as they will no harm to the Pear-trees, which are not so nice in their culture as Peaches and Nectarines; but Cabbages and Beans are very injurious, and therefore inadmissible. If the soil be shallow, and the bottom gravel or chalk, there must be a sufficient depth of good earth laid upon the borders, so as to make them two feet and a half deep; for if the ground be not of that depth, the trees will not thrive well. If the garden is to be new-made from a field, then all the good earth on the surface should be carefully preserved, and if it be taken out where the walks are intended to be made, and laid upon the borders or in the quarters, it will add to the depth

of the soil, and save the bringing in new earth. If the ground can be prepared one year before it is planted, the trees will thrive the better; for by laying the ground in ridges, and turning it over two or three times, it will loosen the soil, and render it much better for planting. Where there is any necessity of bringing fresh earth for the borders, it will be proper to do it as soon as possible, and to mix this with the surface of the earth of the borders, that it may be turned over two or three times, that the parts may be well mixed and incorporated before the trees are planted, adding to it some very rotten dung. In chusing the earth which is to be brought into the garden, take care that if the natural soil of the garden be light and dry, the new earth should be loamy and stiff; but where the natural soil is strong and loamy, then the new earth should be light and sandy. Some persons recommend laying the whole depth of the borders with what they call virgin earth, that is, such as is taken from a pasture where the land has not been ploughed; but unless it be brought into the garden at least a year before the trees are planted, and turned over to sweeten it, this will not be so good as that which is taken from a kitchen-garden, where the land is good, and has been well wrought; for by often turning and breaking the soil, it will be better prepared for receiving the trees. In making the borders on wet ground, covered drains must be formed to carry off the water in winter, otherwise it will greatly injure if not destroy the trees. In building the walls round a kitchen-garden, where the ground is inclinable to be wet, there should be some arches turned in the foundations of those walls, at the lowest part of the garden, to let off the moisture.—The manner of preparing these trees for planting is the same as has been directed for other fruit-trees, viz. to cut off all the small fibres from the roots, and to shorten some of the longest roots, and cut off all the bruised ones, or such as shoot downright; this being done, plant them at the distance already mentioned. The best time to plant them, if upon a middling or dry soil, is in October or November, leaving their heads on till spring, which should be fastened either to the walls or stakes, to prevent the wind from disturbing their roots; and in the beginning of March the heads should be cut off in the manner already directed for Peaches and other fruit-trees, observing also to lay some mulch upon the surface of the ground about their roots when they are planted. In wet ground, the trees may be planted in February, or at the beginning of March, at any time before the buds are much swelled; but these may be cut down when they are planted. The first summer after planting, the branches should be trained to a wall or espalier, (against whichever they are planted,) without shortening them, in a horizontal position as they are produced; and at the Michaelmas following, some of these shoots should be shortened down to five or six eyes, in order to obtain a sufficient quantity of branches to furnish the lower part of the wall or espaliers: but the shoots ought not to be shortened, unless where there is a want of branches to fill a vacancy; therefore the less a knife is used to these trees, the better they will succeed; for when the shoots are stopped, it occasions the buds immediately below the cuts to send forth two or more shoots, whereby there will be a confusion of branches, and fruit is rarely produced under this management. The distance at which the branches of Pears should be trained, must be proportioned to the size of their fruit; therefore such sorts, the fruit of which are small, may be allowed five or six inches, but the larger at least require seven or eight. If this be observed, and the branches trained horizontally as they are produced, there will be no occasion for so much cutting as is generally practised on these trees, which, instead of checking their growth, causes them to shoot the stronger. The following are the directions of Mr. Miller for the pruning and proper management of these trees; by which, he asserts, a learner will be sufficiently instructed in the shortest way possible. Pear-trees generally produce their blossom-buds first at the extremity of the last year's shoots, so that if they are shortened, the blossoms are cut off; this occasions the buds immediately below the cut to put forth two or more shoots, which will increase the number of branches, and crowd the trees with too much wood. Besides, those buds which by the management produce shoots, would have only produced cursons or spurs, upon which the blossom-buds are produced, if the leading branch had not been shortened; therefore these should never be shortened, unless to furnish wood for a vacancy. It is not necessary to provide a new supply of wood in Pear-trees, as must be done for Peaches, Nectarines, &c. which only produce their fruit upon young wood, for Pears produce theirs upon cursons or spurs emitted from branches of three or four years old. During summer, these trees should be often looked over to train in the shoots, as they are produced regularly to the wall or espalier, and to displace foreright and luxuriant branches as they shoot out, whereby the fruit will be equally exposed to the air and sun, which will render them more beautiful and better tasted than when they are shaded by the branches; and by thus managing the trees in summer, they will always appear beautiful, and will require but little pruning in winter. Where Pear-trees are thus regularly trained without stopping their shoots, and have full room for their branches to extend on each side, there will never be any occasion for disbarking the branches, or cutting off the roots, which methods, however they may answer the intention for the present, will certainly injure the trees, as must all violent amputations; which should as much as possible be avoided in the management of fruit-trees. The season for pruning these trees is any time after the fruits are gathered, until the beginning of March; but the sooner it is done after the fruit is gathered, the better, for the same reasons already given for pruning of Peach-trees; see *Amygdalus*. The deferring of this indeed till spring, where there are large quantities of trees to prune, is not so injurious to them as to some tender fruits; but if the branches are regularly trained in summer, and the luxuriant shoots rubbed off, there will be little left to do to them in winter. All the sorts of Summer Pears will ripen very well on standards, dwarfs, or espaliers, and so will Autumn Pears; but where persons are very curious in their fruit, they should plant them against espaliers, in which method they take up but little room in the garden, and, if well managed, appear very beautiful; and the fruit is larger and better tasted than those produced on dwarfs, as before observed; but some of the Winter Pears must be planted against east, south-east, or south-west walls, otherwise they will not ripen well in unfavourable seasons. But though this may be the case with some of the late Winter Pears, yet most of them ripen extremely well in all warm situations, when they are planted in espalier, and the fruit will be better flavoured than that which grows against walls, and will keep much longer good; for as the heat against walls which are exposed to the sun will be very great at some times, and at others there will be little warmth, all fruit which grow near them will be hastened unequally, and therefore are never so well flavoured as the same sorts are which ripen in the open air; and all the fruit which is thus unequally ripened, will decay much sooner than those which ripen gradually in the open air; therefore those Winter Pears which grow in espalier may be kept six weeks longer than

those which grew against walls, which is a very desirable thing; for to have plenty of this fruit at a season when it is very rare to find any other, except Apples, is very desirable, and may be accomplished by planting many of the late sorts in espalier, where, although the fruit will not be so well coloured as those from the walls, yet they will be found exceedingly good. Wherever a person has a warm situation and a kindly soil, there is no need of building walls for Pear-trees, which will ripen their fruit better upon espaliers, especially if a sufficient quantity of reed-mats were made to fix up against the back of the espalier in the spring while the trees are in blossom, which will screen them from cold winds, and preserve the tender fruit until they are past danger. The reeds may then be removed under a shed to preserve them from the weather, and, if the autumn should prove bad, may be fixed up again; which will forward the ripening of the fruit, and also prevent the winds from blowing down and bruising it. Nevertheless, after it is set and growing, further care will be necessary to ensure its goodness; for it is not enough to have preserved a good crop of fruit on the trees, and then leave them entirely to nature during the season of their growth, but there will require some skill and attendance on the trees, to help nature, or supply the deficiency of seasons; for besides the pruning and training trees in the manner before directed, there will also be wanting some management of their roots, according to the nature of the soil and the difference of the seasons. In all strong land, where the ground is apt to bind very hard in dry weather, the surface of the border should be now and then forked over to loosen the earth, which will admit the showers and dews to penetrate and moisten the ground, will destroy the weeds, and also forward the growth of the trees and fruit. If the soil be light and dry, in droughty seasons large hollows should be made round the stems of the trees to hold water; and into each of these there should be poured eight or nine pots of water, which should be repeated once in a week or ten days, during the months of June and July, in dry seasons. There should also be some mulch laid over the surface of these hollows, to prevent the sun and air from drying the ground. Where this is done, the fruit will be kept constantly growing, and prove large and plump; whereas if it be omitted, the fruit will often turn out small, crack, and even fall off from the trees: for if the fruit be once stinted in its growth, and rain should fall plentifully after, it will occasion a great quantity of fruit to fall off the trees; and those which remain to ripen, will not keep so long as those which never received any check in their growth: and it is from this cause that some years the fruit in general decays before the usual time; for after it has been some time stinted in its growth, if the season prove favourable, it receives a sudden supply of juice, and becomes so distended that the vessels burst, and the fruit loses its firmness, and decays. Some dressing should be laid on the ground near these fruit-trees in autumn, after they are pruned. This dressing should be different, according to the nature of the soil. If the land be warm and dry, then the dressing should be of very rotten dung, mixed with loam; and if this be mixed six or eight months before it is laid upon the borders, and three or four times turned over, it will be the better; and so will the mixture, if it be cow's or hog's dung, both which are colder than horse-dung, and therefore more proper for hot land. But in cold stiff land, rotten horse-dung, mixed with light sandy earth, or sea-coal ashes, will be most proper, as it will loosen the ground and add a warmth to it. These dressings should be repeated every other year, otherwise the trees will not thrive so well, nor the fruit be so good, for the finest fruit in England is produced on land which is most dunged and worked. Wherever the ground in the quarters is well dressed and trenched, the fruit-trees will partake of the benefit; for as they advance in their growth, their roots extend to a greater distance from each stem, and it is chiefly from the distant roots that the trees are supplied with their nourishment; and hence dressing the borders only will not be sufficient for old fruit-trees.—In gathering of Pears, great regard should be had to the bud which is formed at the bottom of the footstalk, for the next year's blossoms, which, by forcing off the Pear before it be mature, is many times spoiled; for while the fruit is growing, there is always a bud formed by the side of the footstalk upon the same spur, for the next year's fruit; but when the Pears are ripe, if they be gently turned upward, the footstalk will readily part from the spur, without injuring the bud. The season for gathering all summer Pears is just as they are ripe, for none of them will remain good above a day or two after they are taken from the tree; nor will many of the autumn Pears keep good above ten days or a fortnight after they are gathered. But the winter fruit should hang as long upon the trees as the season will permit; for they must not be exposed to the frost, which will cause them to rot, and render their juices flat and ill-tasted; but if the weather continue mild until the end of October, it will then be a good season for gathering them in, which must always be done in dry weather, and when the trees are perfectly dry. In doing this, carefully avoid bruising them; therefore you should have a broad flat basket to lay them in as they are gathered; and when they are carried into the store-room, they should be taken out singly, and each sort laid up in a close heap on a dry place in order to sweat, where they may remain for ten days or a fortnight, leaving the windows open to admit the air, in order to carry off all the moisture perspired from the fruit: after this the Pears should be taken singly, and wiped dry with a woollen cloth, and then packed up in close baskets, observing to put some wheat straw in the bottoms and round the sides of the baskets, to prevent their bruising against the baskets. And if some thick soft paper be laid double or treble all round the basket, between the straw and the Pears, it will prevent them from imbibing the musty taste so often communicated to fruit when in contact with straw; which taste often penetrates so strongly through the skin, that when the fruit is pared the taste will remain. You should also observe to put but one sort of fruit into a basket, lest by their different fermentations they should rot each other; but if you have enough of one sort to fill a basket which holds two or three bushels, it will be still better. After you have filled the baskets, you must cover them over with wheat-straw very close, first laying a covering of paper two or three times double over the fruit, and fasten them down; then place these baskets in a close room, where they may be kept dry, and from frost; but the less air is let into the room, the better the fruit will keep. It will be very necessary to fix a label to each basket, denoting the sort of fruit therein contained, which will save the trouble of opening them whenever you want to know the sorts of fruit; for the oftener they are opened before the season for eating, the worse they will keep. Some imagine fruit cannot be laid too thin; for which reason they make shelves to dispose them singly upon, and are fond of admitting fresh air whenever the weather is mild, supposing it necessary to preserve the fruit; but the reverse of this is found true, by those persons who have large stocks of fruit laid up in their store-houses at London, which remain closely shut up for several months, in the manner before related; and when these are opened,

the fruit is always found plumper and sounder than any of those fruits which are preserved singly upon shelves, the skins of which are generally dry and shrivelled. For, as Mr. Boyle observes, the air is the cause of putrefaction; and in order to prove this, that celebrated writer put fruits of several kinds into glasses where the air was exhausted, in which places they remained sound for several months, but, upon being exposed to the air, rotted in a very short time after; which plainly shews the absurdity of exposing gathered fruit to the operation of the air.

2. Pyrus Pollveria; *Woolly-leaved Pear Tree.* Leaves serrate, tomentose underneath; flowers corymbed. This differs from the common Pear-tree, in having the leaves downy on both sides, but especially beneath; and the flowers cream-coloured, smaller, and more numerous, about forty in each corymb: the fruit is small, and falls easily when ripe. —Native of Germany.

3. Pyrus Nivalis; *Alpine Pear Tree.* Leaves quite entire; flowers corymbed; fruit globular, extremely acerb, but when ripe melting and very sweet.—Native of the mountains of Austria.

4. Pyrus Malus; *Common Apple Tree.* Leaves elliptic-oblong, acuminate, serrate, smooth; umbels simple, sessile; claws of the corolla shorter than the calices; stem smooth. —This is a spreading tree, with the branches and twigs irregular and twisted, more horizontal than in the Pear-tree: flowers in terminating, sessile, villose umbels; corollas white, but finely tinged with red on the outside. The Apple-tree in its wild state is called the Crab, or Wilding, and, like the Wild Pear, is armed with thorns. Linneus distinguishes two varieties of the Wild Apple: the common one, with a very acid fruit, and another with a bitter fruit, which becomes sweetish when ripe. Mr. Miller also mentions two varieties in the fruit of the Crab Apple, one white; the other purple towards the sun: it is, however, commonly yellowish green with a tinge of red. He also mentions a variety with variegated leaves; but when the trees grow vigorous, the leaves soon become plain.—The following discrimination of the Apple-tree from that of the Pear, will materially assist young botanical students; it is the fruit of Haller's observations. The Apple-tree has many things in common with the Pear-tree, but the leaf is more shortly mucronate, less manifestly serrate, subhirsute underneath; the flowers tinged with red, and smelling very sweet; the peduncle shorter; the stamina usually from nineteen to twenty-five, the Pear having only twenty-two; the fruit round, hollowed at the peduncle, depressed at top, less astringent, but more acid than the Pear, and of a softer texture. The Apple has woody threads passing through it from the peduncle, ten of which are regularly disposed round the capsules, and tend to the calix: the Pear also has them, but they are not so distinct, on account of the calculous or stony congeries. In the Apple they are placed very regularly, one at the point of each cell of the capsule, and one in the middle between the other five, and are very apparent on a transverse section of the fruit. The cells are differently shaped in the two fruits: in the Apple they are narrow and pointed at both ends; in the Pear they are obovate, broad exteriorly, and drawing to a point at the end next the centre of the fruit. The Pear, however it may vary in shape, size, colour, taste, &c. by cultivation, is generally convex, and lengthened at the base; whereas in the Apple it is always concave there. Besides this, the leaves of the Apple are commonly wider in proportion to their length, of a yellower green above, and whitish underneath; whereas in the Pear they are dark green above, and quite smooth on both sides. Their vascular system is very different, being loose in the Apple, and very close in the Pear; hence the leaves of the latter are much stouter and more permanent. Lastly, the growth of these trees is quite different; the Pear being lofty and upright, the Apple low and spreading.—The wood of the Wild Apple is tolerably hard; it turns very clean; and, when made into cogs for wheels, acquires a polish, and lasts a long time. The bark affords a yellow dye. The acid juice of the fruit is called Verjuice, and is much used in recent sprains, and in other cases, as an astringent or repellent. With a proper addition of sugar, it is probable a very grateful liquor might be made with the juice, little inferior to Rhenish wine. Lightfoot asserts, that the Crab mixed with cultivated Apples, or even alone, if thoroughly ripe, will make a sound masculine cider. Every one knows that cider is made from the juice of a variety of cultivated Apples, pressed and fermented. Pomatum is so called, because the lard is, or ought to be, beaten up with the pulp of Apples. This fruit when ripe is laxative; and the juice is excellent in the dysentery; boiled or roasted, it fortifies a weak stomach; and they are equally efficacious in putrid or malignant fevers, with juice of lemons or currants.—The following is Miller's account of the varieties of Apples. After enumerating and briefly describing those Apples which have been introduced from France into England, Mr. Miller observes, that only two or three of them are much esteemed, viz. 1. The French Rennet, which is a large fine fruit, of a roundish figure, and of a pale green, changing a little yellowish when ripe, having some small gray spots: the juice is sugary, and it is good for eating or baking, and will keep sound till after Christmas. 2. The Rennette Grise, is a middle-sized fruit, of a deep gray colour on the side next the sun, but on the other side intermixed with yellow: it is a very juicy good Apple, of a quick flavour, and ripens in October, but will not keep long. 3. The Violet Apple, which is a pretty large pale green fruit, striped with deep red in the sun. The juice is sugary, and has a flavour of violets, from which it derived its name.—1. The first English Apple brought to market is the Codlin, which is so well known that it needs no description. 2. The next is the Margaret Apple: this fruit is not so long as the Codlin, and of a middling size; the side next the sun changes to a faint red when ripe; the other side is of a pale green: the fruit is firm, of a quick pleasant taste, but does not keep long. 3. The Summer Pearmain, is an oblong fruit, striped with red next the sun; the flesh is soft, and soon becomes mealy, so that it is not greatly esteemed. 4. The Kentish Fill-basket, is a species of Codlin, of a large size, and somewhat longer-shaped than the Codlin: it ripens a little later in the season, and is generally used for baking. 5. The Transparent Apple, was brought to England some years since, and was esteemed a curiosity: it came from Petersburgh, where it is asserted to be so transparent that the kernels may be perfectly seen when the Apple is held to the light; but in this country it is a mealy insipid fruit not worth cultivation. 6. Loan's Pearmain: this is a beautiful fruit, being of a middling size; the side next the sun is of a beautiful red, and striped with the same colour on the other; the flesh is vinous, but as it soon grows mealy, it is not greatly esteemed. 7. The Quince Apple, is a small fruit, seldom larger than the Golden Pippin; but is in shape like the Quince, especially towards the stalk; the side next the sun is of a russet colour, on the other side inclining to yellow: it is an excellent Apple for about three weeks in September, but will not keep much longer. 8. The Golden Rennet, needs no description; it ripens about Michaelmas, and for about a month is very good fruit either for eating raw or baking. 9. The Aromatic Pippin, is also a very good apple: it is about the size of a

Nonpareil, but not so flat, and is a little longer; the side next the sun is of a bright russet colour: the flesh is breaking, and has an aromatic flavour. It ripens in October. 10. The Hertfordshire Pearmain, sometimes called the Winter Pearmain, is a good-sized fruit, rather long than round, of a fine red next the sun, and striped with the same colour on the other side; the flesh is juicy, and stews well, but is not esteemed for eating by any nice palates. This is fit for use in November and December. 11. The Kentish Pippin, is a large handsome fruit, of an oblong figure; the skin is of a pale green colour: the flesh is breaking, and full of juice, which is of a quick acid flavour. This is a very good kitchen fruit, and will keep till February. 12. The Holland Pippin, is larger than the former; the fruit is somewhat longer, the skin of a darker green, and the flesh firm and juicy. This is a very good kitchen fruit, and will keep late in the season. 13. The Monstrous Rennet, is a very large apple, of an oblong shape, turning red towards the sun, but of a dark green on the other side; but, as the flesh is apt to be mealy, it is generally preserved solely for the magnitude of the fruit. 14. The Embroidered Apple, is a pretty large fruit, somewhat shaped like the Pearmain, but the stripes of red are very broad, from whence the gardeners have given it this title: it is a middling fruit, and is commonly used as a kitchen apple, though there are many better. 15. The Royal Russet, by some called the Leather Coat Russet, on account of the deep russet colour of the skin, is a large fair fruit, of an oblong figure, broad towards the base, with a flesh inclinable to yellow. This is one of the best kitchen Apples we have, and is a very great bearer: the trees grow large and handsome; and the fruit, which is pleasant eating, is in season from October to April. 16. Wheeler's Russet, is middling-sized, flat, and round; the stalk is slender; the side next the sun of a light russet colour, and the other side inclining to a pale yellow when ripe. The flesh is firm, and the juice has a very quick acid flavour, but is an excellent kitchen-fruit, and will keep a long time. 17. Pile's Russet, is not quite so large as the former, but is of an oval figure, of a russet colour to the sun, and of a dark green on the other side; it is a very firm fruit, of a sharp acid flavour, but much esteemed for baking, and will keep sound till April or later, if they are well preserved. 18. The Nonpareil, is a fruit pretty generally known in England, though there is another apple frequently sold in the markets for it, which is what the French call Haute-bonne; this is a larger fairer fruit than the Nonpareil, more inclining to yellow, the russet colour brighter, and it is earlier ripe and decays sooner: this is not so flat as the true Nonpareil, nor is the juice so sharp, though it is a good apple in its season; but the Nonpareil is seldom ripe before Christmas, and, if well preserved, will keep perfectly sound till May. This therefore is justly esteemed one of the best apples yet known. 19. The Golden Pippin, is a fruit almost peculiar to England, as there are few other countries where it succeeds well; nor indeed does it, in some parts of England itself, produce such good fruit as it might; which is in some measure owing to their being grafted on free-stocks, which enlarge the fruit, but render it less valuable, because the flesh is not so firm, nor the flavour so quick; hence it is apt to be dry and mealy, and should, to prevent that, be always grafted on a Crab-stock, which will not canker like the others; and though the fruit will be less sightly, it will be better flavoured, and keep longer. The above are the best sorts of Apples, so that where they can be had, no person will prefer others.—In Mr. Miller's time, the apples in most esteem for cider-making, were the Red Streak, which is still in being, but on the decline. The Devonshire Royal Wilding; the Whitsour; the Herefordshire Under-Leaf; the John Apple; the Everlasting Hanger; the Gennet Moyle. These have been since gradually yielding to other varieties, which will be supplanted in their turn by others; and it is now generally allowed, that apples, which are the produce of art and cultivation, cannot be continued beyond a certain period. The law of nature, Mr. Marshal observes, though it suffer man to improve the fruits which are presented to him, appears to have set bounds to his art, and to have determined the years of his creations. Artificial propagation cannot preserve the varieties in perpetuity; a time arrives, when they can be no longer propagated with success; hence all the old Cider fruits are lost, or are so far on the decline as to be deemed irrecoverable. The popular idea among the orchard-men of Herefordshire is, that the decline of the old fruits is owing to a want of fresh grafts from abroad, under a notion that the highest flavoured apples grow there in a state of nature, as the Crab does in this island. It hardly needs to be observed, that this is a gross error.—*Propagation and Culture.* All the sorts of Apples are propagated by grafting or budding upon the stocks of the same kind, for they will not take upon any other sort of fruit-tree. In the nurseries there are three sorts of stocks generally used to graft Apples upon; the first are called free-stocks; these are raised from the kernels of all sorts of Apples indiscriminately, and sometimes they are all called Crab-stocks; for all those trees which are produced from the seeds before they are grafted, are termed Crabs, without any distinction: but I, says the judicious Philip Miller, should always prefer such stocks as are raised from the kernels of Crabs, where they are pressed for verjuice, and I find several of the old writers of the same mind. Austen, who wrote above a hundred years ago, says, the stock which he accounts best for Apple-grafts, is the Crab, which is better than sweeter Apple-trees to graft on, because they are usually free from canker, and will become very large trees, and, I conceive, will last longer than stocks of sweeter Apples, and will make the fruit more strong and hardy to endure frost: it is in fact very certain, that by frequently grafting some sorts of Apples upon freer-stocks, the fruits have been rendered less firm and poignant, and of shorter duration. The second sort of stock is the Dutch Paradise Apple, or Creeper; these are designed to stint the growth of the trees, and to keep them in compass for dwarfs or espaliers. The third sort is the Paradise Apple, which is a very low shrub, and the only proper trees which are kept in pots by way of curiosity, for they do not continue long. Some persons have made use of Codlin-stocks for grafting Apples, in order to stint their growth; but as these are commonly propagated by suckers, I would by no means, says Mr. Miller, advise the using them; nor would I chuse to raise the Codlin-trees from suckers, but to graft them upon Crab-stocks, which will cause the fruit to be firmer, last longer, and have a sharper flavour; and such trees will last much longer sound, and never put out suckers, as the Codlins always do, which if not constantly taken off, will weaken the trees, causing them to canker: it is not only from the roots, but from the knots of their stems, that there are generally a great number of strong shoots produced, which fill the trees with useless wood, and render them unsightly, and the fruit small and crumpled. The method of raising stocks from the kernels of Crabs or Apples, is to procure them where they are pressed for verjuice or cider, and after they are cleared of the pulp, they may be sown upon a bed of light earth, covering them over about half an inch thick with the same light earth: these may be sown in November and December, where the ground is dry; but in wet ground, it will be better to defer it till February, but then

the seeds should be preserved in dry sand, and kept out of the reach of vermin; and mice and rat traps should be set, to protect them from those destructive animals. In the spring, when the plants begin to appear, they must be carefully weeded, and, if the season should prove dry, it will be of great service to water them two or three times a week; and during the summer they must be kept clean from weeds, which, when suffered to grow, will soon overtop the plants, and spoil their growth. If these thrive well, they will be fit to transplant into the nursery in October following, at which time the ground should be carefully digged, and cleansed from the roots of all bad weeds; then the stocks should be planted in rows three feet asunder, and the plants one foot distance in the rows, closing the earth pretty fast to their roots; when the stocks are transplanted out of the seed-bed, the first autumn after sowing they need not be headed; but where they are inclined to shoot downward, the tap-root must be shortened, in order to force out horizontal roots; if the ground be pretty good in which these stocks are planted, and the weeds constantly cleared away, the stocks will make great progress, so that those which are intended for dwarfs may be grafted the spring twelve-months after they are planted out of the seed-bed; but those which are designed for standards, will require two or three years' more growth before they will be fit to graft, by which time they will be upward of six feet high. The grafting should be performed in March, either by whip or cleft-grafting, according to the size of the stock. See *Grafting*. The stocks designed for dwarfs must be grafted within six inches of the ground; and the standards may also be grafted low, one shoot from the graft being trained up for a stem; or on tall stocks, at the height of five or six feet, but for low and half-standards, at from two or three to four or five feet, and lower for dwarf standards. The other necessary directions for the cultivation of these trees, while they remain in the nursery, will be found by referring to the article *Nursery*.—The manmanner of planting such of these trees as are designed for espaliers: In the kitchen-garden, if there be an extent of ground, it will be proper to plant, not only such sorts as are for the use of the table, but also a quantity of trees to supply the kitchen; but where the kitchen-garden is small, the latter must be supplied from standard-trees, either from the orchard, or wherever they are planted; but as many of these kitchen Apples are large, and hang late in the autumn upon the trees, they will be much more exposed to the strong winds on standard trees, than in espaliers. The distance proper for these trees should not be less than thirty feet, for such sorts as are of moderate growth, if upon Crab or free stocks; but the larger growing sorts should not be allowed less than thirty-five or forty feet, which will be found full near enough, if the ground be good, and the trees properly trained; for as the branches of these trees should not be shortened, but trained in their full length, so in a few years they will be found to meet. Indeed, at the first planting, the distance will appear so great to those persons who have not observed the vigorous growth of these trees, that they will suppose they never can extend their branches so far as to cover the espalier; but if those persons will but observe the growth of standard trees of the same kinds, and see how wide their branches are extended on every side, they may be soon convinced, that as these espalier trees are allowed to spread but on two sides, they will of course make more progress (as the whole nourishment of the root will be employed in these side-branches) than where there is a greater number of branches on every side of the tree, which are to be supplied with the same nourishment.—The next thing to be observed, is to choose such sorts of fruit as grow nearly alike, to plant in the same espalier. This is of great consequence, because of the distance at which they are to be placed, otherwise those sorts which make the longest shoots may be allowed less room to spread than those of smaller growth: beside, when all the trees in one espalier are nearly equal in growth, they will have a better appearance than when some are tall and others short. To avoid this, the different sorts of Apples are here divided into three classes according to their growth. *First Class.* Largest growing trees. 1. All the sorts of Pearmains. 2. Kentish Pippin. 3. Holland Pippin. 4. Monstrous Rennet. 5. Royal Russet. 6. Wheeler's Russet. 7. Pile's Russet. 8. Nonpareil. 9. Violet Apple.—*Second Class.* Middle growing trees. 1. Margaret Apple. 2. Golden Rennet. 3. Aromatic Pippin. 4. Embroidered Apple. 5. Rennet Grise. 6. White Rennet. 7. Codlin.—*Third Class.* Smallest growing trees. 1. Quince Apple. 2. Transparent Apple. 3. Golden Pippin. 4. Pomme d' Api. 5. Fenouillet. All these are supposed to be grafted on the same sort of stocks. If these Apples be grafted upon Crab-stocks in a good soil, place the largest-growing trees forty feet asunder, the middle-growing thirty-five feet, and the small-growing at twenty-five feet. When planted at shorter distances, the branches have almost joined in seven years' time, so that it is better to place them at first at a proper distance, introducing Dwarf Cherries, Currants, or other sorts of fruit, between, for a few years, and cutting them away as fast as the branches of the Apple-trees require more room. When the trees are grafted upon the Dutch Dwarf-stock, the distance should be for the larger-growing trees thirty feet, for those of middle growth twenty-five, and the smallest twenty feet, which will be found full near where the trees thrive well.—The next thing is to choose the trees, which should not be more than two years' growth from the graft, but those of one year should be preferred; you should also be careful that their stocks are young, sound, and smooth, free from canker, and which have not been cut down once or twice in the nursery; when they are taken up, all the small fibres should be entirely cut off from their roots, for, if left on, they will moulder and decay, and obstruct the new fibres, which would soon push out in their growth. The extreme part of the root must also be shortened, and all bruised roots cut off; and if there are any misplaced roots which cross each other, they also should be cut away. As to the pruning of the head of these trees, there need be nothing more done than to cut off any branches which are so situated as that they cannot be trained to the line of the espalier; in the planting, there must be care taken not to place their roots too deep in the ground, especially if the soil is moist, but rather raise them on a little hill, which will be necessary to allow for the raising of the border afterwards. The best season for planting these trees is at the end of November; after they are planted, it will be proper to place down a stake to each tree, to which the branches should be fastened, to prevent the winds from shaking or loosening their roots, which will destroy the young fibres; for when these trees are planted pretty early in autumn, they will very soon push out a great number of new fibres, which being very tender, are soon broken by the wind shaking the trees, which is very injurious. If the winter should prove severe, it will be proper to lay some rotten dung, tanner's bark, or some other sort of mulch, about their roots, to prevent the frost from penetrating the ground, which might kill the tender fibres. This mulch should not be laid down before the frost begins; for if laid over the surface of the ground about their roots, as is often done, soon after the trees are planted, it will prevent the moisture entering the ground,

and do more harm than good to the trees. The following spring, before the trees begin to push, there should be two or three short stakes put down on each side every tree, to which the branches should be fastened down as horizontally as possible; never cutting them down, for there will be no danger of their putting out branches enough to furnish the espalier, if the trees are once well established in their new quarters. In the pruning of these trees, the chief point is, never to shorten any of the branches, unless there be an absolute want of shoots to fill the spaces of the espalier, so that the best method to manage these trees is to go over them three or four times in the growing season, and rub off all such shoots as are irregularly produced, and train the others down to the stakes in the position they are to remain: if this be carefully performed in summer, there will be little left to be done in the winter; and by bending their shoots from time to time as they are produced, there will be no occasion to use force to bring them down, nor any danger of breaking the branches. The distance which these branches should be trained from each other, for the largest sorts of fruit, should be about seven or eight inches, and for the smaller four or five. If these plain instructions be followed, it will save much unnecessary labour of pruning, and the trees will at all times make a handsomer appearance. The cursons or spurs upon which all the sorts of Apples produce their fruit, will continue fruitful a great number of years, and should not be cut off in pruning, for that very reason. The method of making *Espaliers* will be found under that article; here it is only necessary to repeat, that it will be best to defer making the espalier till the trees have had three or four years' growth; for before that time the branches may be supported by a few upright stakes, so that there will be no necessity to make the espalier until there are sufficient branches to furnish all the lower part.—*Orchards.* The following are Mr. Miller's directions for planting an orchard, so as to produce the greatest profit. The best situation for an orchard is on the ascent of gentle hills, facing the south or south-east; but this ascent must not be too steep, lest the earth be washed down by hasty rains. There are many who prefer low situations at the foot of hills, but I am thoroughly convinced that all bottoms, where there are hills on each side, are very improper for this purpose; for the air is drawn down into these valleys in strong currents, which, being pent in, renders these bottoms much colder than the open situations; during the winter and spring they are very damp, and unhealthy to all vegetables: therefore the gentle rise of a hill, fully exposed to the sun and air, is by much the best situation. As to the soil, a gentle hazel-loam which is easy to work, and that does not detain the wet, is the best; if this happens to be three feet deep, it will be better for the growth of the trees; for although these trees will grow upon very strong land, yet they are seldom so thriving, nor is their fruit so well flavoured, as those which grow in a gentle soil: while, on the other hand, these trees will not do well upon a dry gravel or sand; so that those soils should never be chosen for orchards. The ground intended to be planted ought to be well prepared the week before, by ploughing it thoroughly; and if some dung be laid upon it the year before, it will be of great service to the trees; if in the preceding spring a crop of Peas or Beans be planted on the ground, provided they are sown or planted in rows at a proper distance, so that the ground between may be horse-hoed, that will destroy the weeds and loosen the ground, and form a good preparation for the trees, as the earth cannot be too much wrought or pulverized for this purpose: these crops will be taken off the ground long before the season for planting these trees, which should be performed instantly when the trees begin to shed their leaves. In chusing orchard trees, I would advise the taking such as are but of two years' growth from the graft, and never to plant old trees, or such as are grafted upon old stocks, for young trees are not only more certain to grow, but make a much greater progress. The roots must be pruned in the same manner as above directed for the espaliers: in pruning their heads, little more is necessary than to cut out such branches as are ill placed, or that cross and chafe each other: heading them down, as it is properly called, never fails to injure and kill many trees. The distance at which these orchard trees should be planted, where the soil is good, must be fifty or sixty feet, and forty feet only in inferior soils. Nothing is worse than crowding trees too closely in orchards; and it appears to have been the opinion of the most eminent cultivators, that the trees had much better be too far apart than too near, the latter excluding the sunshine and fresh air from the roots, trunks, branches, and blossoms of the tree. When the trees are planted, they should be staked, to prevent their being shaken or blown out of the ground by strong winds; but in doing this there should be particular care taken to put either straw, hay-bands, or woollen cloth, between the trees and the stakes, to prevent the trees from being rubbed and bruised by the shaking against the stakes. If the first winter should prove very severe, it will be proper to cover the surface of the ground about their roots with some mulch, to defend the fibres of their roots: this mulch ought not to be too soon laid on, lest it should prevent the moisture from soaking down to the roots of the trees; nor should it lie on too long in the spring, for the same reason: but where persons will be at the trouble to lay it on in frosty weather, and remove it again after the frost is over, that the wet in February may have free access to the roots of the trees, it will do good; and if March should prove dry, with sharp north or west winds, which often happens, it will be proper to cover the ground again with the mulch, to prevent the winds from penetrating and drying the ground, and will be of singular service to the trees. Many will object to this on account of the trouble, which may appear to be great; but when it is considered how much of this business may be done by a single person in a short time, it can have little force; and the benefit which the trees will receive by this management, will greatly recompense the trouble and expense. As these trees must be constantly fenced from cattle, it will be the best way to keep the land in tillage for some years, that by constant ploughing or digging the ground, the roots of the trees may be more encouraged, and they will make the more progress in their growth; but where this is done, whatever crops are sown or planted should not be brought too near the trees, lest the nourishment be drawn away from them: and as in the ploughing of the ground, where it is so tilled, there must be care taken not to go too near the stem of the trees, whereby their roots would be injured, or the bark of the stems rubbed off; so it will be of great service to dig the ground about the trees where the plough does not come, every autumn, for five or six years after planting, by which time their roots will have extended themselves to a greater distance. It is a common practice in many parts of England to lay the ground down for pasture after the orchard-trees are grown pretty large; but this is injudicious, for horses will destroy trees even of twenty years' growth, and sheep will constantly rub their bodies against the stems of the trees, and their grease adhering to the bark is very detrimental. In pruning these trees after they are established, nothing more should be done than to cut out all those branches which cross each other, and if

left would rub and tear off the bark, as also decayed branches, but never shorten any of their roots. If suckers or shoots from their stems should come out, they must be entirely taken off annually; and when any branches are broken by the wind, they should be cut off, either down to the division of the branch, or close to the stem from whence it was produced; the best time for this work is in November, for it should not be done in frosty weather, nor in the spring, when the sap begins to be in motion.—The best method to keep Apples for winter use is, to let them hang upon the trees till there is danger of frost, and to gather them in dry weather, laying them in large heaps to sweat for three or four weeks or a month; afterwards look them over carefully, taking out all such as have appearance of decay, wiping all the sound fruit dry, and pack them up in large oil-jars which have been thoroughly scalded and dried, stopping them down close to exclude the external air: this will preserve the fruit plump and sound for use.

5. Pyrus Dioica; *Diœcious Pear Tree.* Leaves oval, serrate; flowers solitary, diœcous; petals linear, the length of the calix.—This is supposed to be a mere variety of the Common Apple-tree.

6. Pyrus Spectabilis; *Chinese Apple Tree.* Leaves oval-oblong, serrate, even; umbels sessile; claws of the corolla longer than the calix; styles woolly at the base. This answers truly to its trivial name; a more showy tree can hardly be found to decorate the ornamental plantation. It blossoms about the end of April, or beginning of May. The flowers are large, of a pale red when open, and semi-double; the buds are of a much deeper hue. The fruit is of but little account, and sparingly produced.—Though perfectly hardy, it should be placed in a sheltered situation. It is usually increased by grafting it on a Crab-stock.

7. Pyrus Prunifolia; *Siberian Crab Tree.* Leaves ovate, acuminate; umbels sessile; peduncles pubescent; styles woolly at the base. The flowers come out in bunches at the side of the branches, on long slender peduncles; the petals are white, and shaped like those of the Pear-tree: they appear in April, and are succeeded by roundish fruit, about the size of large Duke Cherries, changing to a yellow colour variegated with red, of a very austere taste, decaying like the fruit of the Medlar, and then more palatable.—It is supposed to be a native of Siberia.

8. Pyrus Baccata; *Small-fruited Crab Tree.* Leaves equally serrulate; peduncles clustered; pomes berried; calices deciduous.—The fruit, which is of the size of a small cherry, has a reddish pulp and an acid juice, used for making quas and punch in Siberia, where it naturally grows; as also about the lake Baikal, and in Dauria.

9. Pyrus Coronaria; *Sweet-scented Crab Tree.* Leaves cordate, gash-serrate, angular, smooth; peduncles corymbed.—This tree was first observed in Virginia, North America, where it is frequently planted near farms, on account of the fine raspberry-like smell which the flowers afford: they expand in the beginning of May. The fruit is only fit to make vinegar.—It may be increased by grafting or budding on the Common Crab; but it is somewhat tender whilst young.

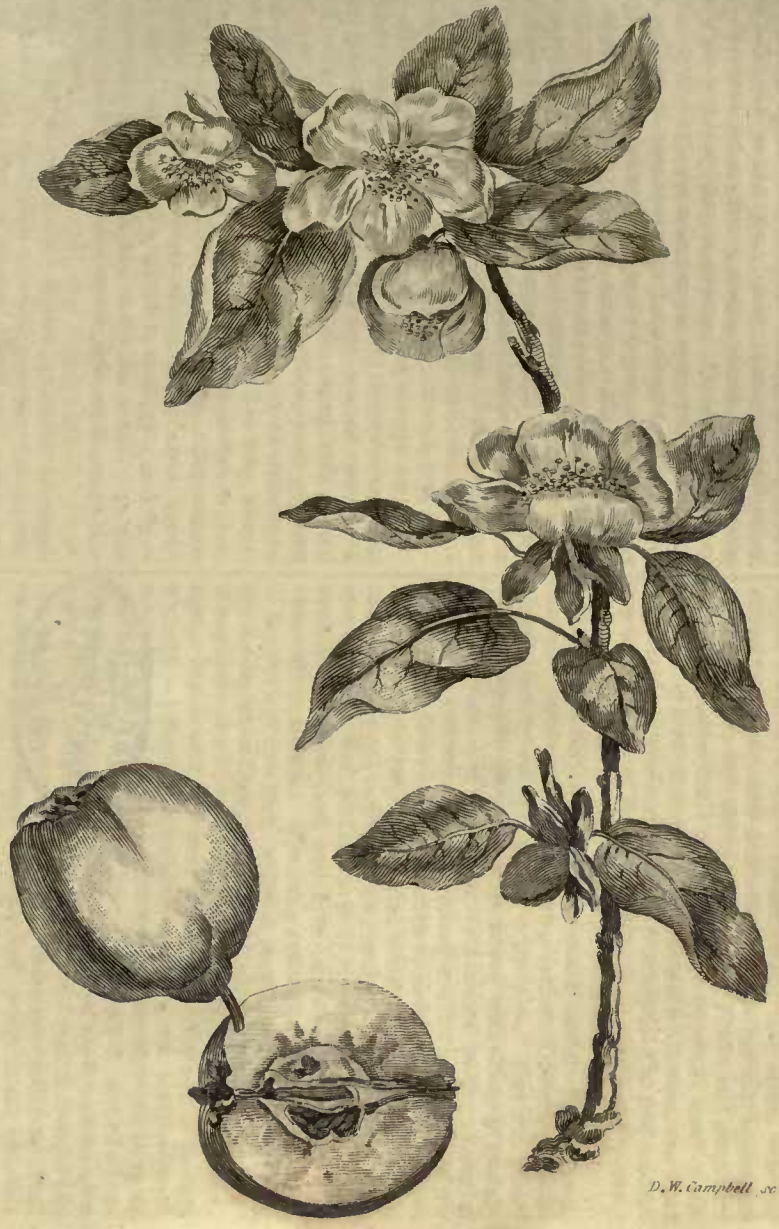
10. Pyrus Angustifolia; *Narrow-leaved Crab Tree.* Leaves lanceolate-oblong, shining, tooth-serrate, attenuated at the base, entire; peduncles corymbed. Fruit very small. It flowers here in May.—Native of North America.

11. Pyrus Japonica; *Japan Apple Tree.* Leaves wedge-shaped, crenate, smooth; flowers solitary.—This small shrub is a native of Japan.

12. Pyrus Cydonia; *Common Quince Tree.* Leaves roundish-elliptic, quite entire, downy beneath; flowers solitary, stalked; calix serrated, reflexed. This is a low, crooked, and distorted tree, covered with a brown bark, and much branched. Petals large, flesh-coloured; fruit large, yellow, very austere and astringent, but with a peculiar and very powerful fragrance, but is rendered mild by cookery, and highly grateful. The variety represented in the accompanying plate is the Pear-shaped Quince. The Apple Quince has more ovate leaves and a rounder fruit; and the Portugal Quince, with obovate leaves and an oblong fruit, is more juicy and less harsh than the others, and therefore most valuable. The expressed juice, repeatedly taken in small quantities, is said to be cooling, restringent, and stomachic, useful in nausea, vomitings, nidorous eructations, and some alvine fluxes. Formerly this juice was ordered to be made into a syrup; but the only preparation of the Quince now directed, is a mucilage of the seeds, made by boiling a drachm of them in eight ounces of water till it acquires a proper consistence: this has been recommended in apthous affections, and excoriations of the mouth and fauces. The pulp of the Portugal Quince is the best for making marmalade.—This species, and all its varieties, may be occasionally propagated either by layers, suckers, or cuttings, which must be planted on a moist soil. Those raised from suckers are seldom so well rooted as those which are obtained from cuttings or layers, and are subject to produce suckers again in greater plenty, which is not so proper for fruit-bearing trees. The cuttings should be planted very early in the autumn, and in very dry weather must be often watered to assist their rooting. The second year after they should be removed into a nursery, three feet distance row from row, and one foot asunder in the rows; where they must be managed as was directed for Apples. In two or three years' time these trees will be fit to transplant where they are to remain, which should be either by the side of a ditch, river, or in a moist place: where they will produce more and larger fruit than in a dry soil, though those in a dry soil will be better tasted and earlier ripe. These trees require very little pruning: the chief thing to be observed is to keep their stems clear from suckers, and to cut off such branches as cross each other; likewise all upright luxuriant shoots from the middle of the tree should be entirely taken out, that the head may not be too much crowded with wood, which is of ill consequence to all sorts of fruit-trees. They may also be propagated by budding or grafting upon stocks raised by cuttings; so that by this method the best sorts may be cultivated in greater plenty than in any other way, and the trees will bear fruit much sooner, and be more fruitful, than those which come from suckers or layers. These trees are also in great esteem for stocks, to graft or bud summer and autumn Pears upon. These stocks greatly improve the Pear-trees, especially those designed for walls and espaliers; for the trees upon these stocks do not shoot so vigorously, and are therefore sooner disposed to bear fruit: but hard winter fruits do not succeed so well upon these stocks, their fruit being very subject to crack, and turning stony, especially all the breaking Pears; hence these stocks are only proper for the melting Pears, and for a moist soil; and the best Quince-stocks are those raised from cuttings or layers. As the Pear will take upon the Quince by grafting or budding, and the Quince upon the Pear, we may conclude there is a near alliance between them; but neither of these will take upon the Apple, nor that upon either of these.

13. Pyrus Salicifolia; *Willow-leaved Crab Tree.* Leaves linear-lanceolate, hoary, white, tomentose underneath; flowers axillary, solitary, subsessile. This is a low bushy tree, from six to nine feet high, branched very much, and shooting up from the root.—Native of Siberia and America.

PYRUS BACCATA ___ *Siberian Crab.*



D. W. Campbell sc.

PYRUS CYDONIA ___ *Pear-shaped Quince.*

Published by Henry Fisher, Caxton, Liverpool. Oct. 1818.

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QUAKING GRASS. See *Briza.*

Qualea; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, deeply four-parted; segments ovate, coriaceous, concave, unequal, the two lower larger, gaping. *Corolla:* petals two, unequal, inserted into the calix; upper erect, roundish, emarginate, ending at the base in a horn-shaped, short, blunt nectary, prominent between the upper segments of the calix; lower larger, bending down. *Stamina:* filamentum one, short, ascending, inserted between the lower petal and the germen; antheræ oblong, grooved, recurved. *Pistil:* germen globular; style filiform, ascending, the length of the stamina; stigma blunt. *Pericarp:* berry one-celled. *Seeds:* very many, nestling in the pulp. *Observe.* The corolla has a bilabiate form. The genus is allied to *Cucullaria.* Essential Character. *Calix:* four-parted. *Corolla:* two-petalled. *Berry:* with many seeds.——The species are,

1. Qualea Rosea. Lower petals blunt; leaves acuminate. This tree attains the height of sixty feet, and of two feet in diameter: the bark is wrinkled, and the wood reddish and compact: at the top it has large branches, some growing right up, others horizontal, spreading wide in all directions. Panicles terminal; flowers numerous, two inches long, sweet-scented, white outside, rose-coloured and yellowish within. —It grows in the forests of Guiana; flowering in September.

2. Qualea Cœrulea. Petals emarginate; leaves acute. This is a tree, from sixty to eighty feet in height, and three feet in diameter, with a bark and wood like the former; the flowers are smaller, and have a sweet pleasant odour.—Native of Guiana.

Quassia: a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, very short; leaflets ovate, permanent. *Corolla:* petals five, lanceolate, elongated, sessile, equal; nectary of five ovate villose scales, inserted into the interior base of the filamenta. *Stamina:* filamenta ten, filiform, equal, the length of the corolla; antheræ oblong, incumbent. *Pistil:* receptacle fleshy, orbicular, elevated, wider than the germen; germen ovate, composed of five; style filiform, the length of the stamina; stigma five-angled. *Pericarp:* five, lateral, distant, inserted into the fleshy orbicular receptacle, ovate, obtuse, two-valved. *Seeds:* solitary, globular. Essential Character. *Calix:* five-leaved. *Petals:* five. *Nectary:* of five scales. *Pericarp:* five, distant, each having one seed.

1. Quassia Amara; *Bitter Quassia.* Flowers hermaphrodite; leaves unequally pinnate; leaflets opposite, sessile; petioles jointed, winged; flowers in racemes. A small tree, or shrub, with many branches: the wood is white and light, the bark thin, and of a gray colour. The root, wood, bark, and indeed all its parts, are intensely bitter. The wood is thought to be less bitter than the bark; and is now regarded as the most powerful medicine.—Quassia has no sensible odour; its taste is that of a pure bitter, more intense and durable than that of almost any other known substance: it imparts its virtues more completely to watery than spirituous menstrua, and its infusions are not blackened by the addition of martial vitriol. Dr. Cullen mentions it as an excellent bitter, and thinks it will do all that a simple bitter can do, but no more: he ascribes the extraordinary commendations which are given it, to the partiality so often shewn to new medicines. It may be given in infusion, or in pills made from the watery extract; the former is generally preferred, in the proportion of three or four drachms of the wood to twelve ounces of water. Quassia derived its name from a negro, named *Quassi,* or *Coissi,* who is said to have employed it with uncommon success as a secret remedy in malignant endemic fevers, which frequently prevailed at Surinam. For a valuable consideration, this secret was disclosed to Daniel Rolander, a Swede, who brought specimens of the wood to Stockholm, in the year 1756; and since that time, the effects of this drug have been generally tried in Europe. The medicinal qualities ascribed to Quassia, are those of a tonic, stomachic, antiseptic febrifuge.—The tree producing it is a native of South America, particularly of Surinam; and also of some of the West India islands.

2. Quassia Simaruba; *Wing-leaved Quassia.* Flowers monœcous; leaves abruptly pinnate; leaflets alternate, subpetioled; petiole naked; flowers in panicles. This tree grows to a considerable height and thickness, with alternate spreading branches. It is known in Jamaica by the names of Mountain Damson, Bitter Damson, and Stave-wood. In the beginning of the last century, an epidemic flux, which prevailed very generally in France, resisted all the medicines usually employed in such cases; under these circumstances, recourse was had to the bark of this plant, which proved remarkably efficacious, and first established its medicinal character in Europe. The drug called *Simaruba* is the bark of the roots of this tree, which is rough, scaly, and warted; the inside, when fresh, is a full yellow, but when dry paler: it has little smell; and the taste is bitter, but not disagreeable. Macerated in water, or in rectified spirit, it quickly impregnates them with its bitterness, and with a yellow tincture: the cold infusion in water is rather stronger in taste than the decoction; which last grows turbid, and of a reddish brown as it cools. Dr. Wright says, most authors who have written on this drug agree, that in fluxes it restores the lost tone of the intestines, allays their spasmodic motions, promotes the secretions by urine and perspiration, removes the lowness of spirits attending dysenteries, and disposes the patient to sleep; the gripes and tenesmus are taken off, and the stools are changed to their natural colour and consistence. In a moderate dose it occasions no disturbance nor uneasiness, but in large doses produces sickness at the stomach and vomiting. He recommends two drachms of the bark to be boiled in twenty-four ounces of water until only twelve remain; the decoction is then to be strained, and divided into three equal parts, the whole of which is to be taken in twenty-four hours; and when the stomach is reconciled to this medicine, the quantity of the bark may be increased to three drachms. To this decoction some join aromatics, others a few drops of laudanum to each dose. Modern physicians have generally found this medicine successful only in the third stage of a dysentery without fever, where the stomach is uninjured, and where the gripes and tenesmus are only continued by a weakness in the bowels. Dr. Cullen says, he cannot perceive any thing in this bark but that of a simple bitter; and observes, that the virtues ascribed to it in dysentery have not been confirmed by his experience, or that of other practitioners in Scotland: indeed, he found an infusion of Chamomile flowers a more useful remedy.—Native of South America, and of most islands in the West Indies.

3. Quassia Excelsa; *Lofty Quassia.* Flowers polygamous, five-stamined, panicled; leaves unequally pinnate; leaflets opposite, petioled; petiole naked. A lofty tree, with a straight trunk. The English call it bitter wood, or bitter ash; and it is frequently sold for the true Quassia.—Native of Jamaica and the Caribbean islands.

Queen's Gilliflowers. See *Hesperis.*

Queen of the Meadows. See *Spiræa.*

Quercus; a genus of the class Monœcia, order Polyandria. —Generic Character. *Male Flowers. Calix:* ament

filiform, long, loose; perianth one-leafed, subquinquefid; segments acute, often bifid. *Corolla:* none. *Stamina:* filamenta five to ten, very short; antheræ large, twin. *Females,* sessile in the bud, on the same plant with the males. *Calix:* involucre consisting of very many imbricate scales, united at the base into coriaceous, hemispherical, little cups; the outer ones larger, one-flowered, permanent; perianth very small, superior, six-cleft, permanent; segments acute, surrounding the base of the style, pressed close. *Corolla:* none. *Pistil:* germen very small, ovate, inferior, three-celled; rudiments of the seeds double; style simple, short, thicker at the base; stigmas three, reflex. *Pericarp:* none. *Seed:* a nut, (acorn,) ovate, cylindrical, coriaceous, smooth, filed at the base, one-celled, fixed in a short hemispherical cup, which is tubercled on the outside. ESSENTIAL CHARACTER. *Male. Calix:* commonly five-cleft. *Corolla:* none. *Stamina:* five to ten. *Female. Calix:* one-leafed, quite entire, rugged. *Corolla:* none. *Style:* one. *Stigmas:* two to five. *Seed:* one, ovate.

——The species are,

1. Quercus Phellos; *Willow-leaved Oak Tree.* Leaves deciduous, lanceolate, quite entire; nut roundish.—This grows naturally in North America, where they distinguish two sorts; one of them called the Highland Willow Oak, and grows upon poor dry land: the other grows in low moist land, and rises to a much greater height; the leaves are larger and narrower, but the acorns are of the same size and shape. The difference arises from soil and situation.

2. Quercus Molucca. Leaves lanceolate, ovate, smooth, quite entire. A large and lofty tree, whose wood is hard and heavy, lasting long under water.—It received its trivial name from being found in the Molucca Islands.

3. Quercus Glabra. Leaves lanceolate-oblong, acuminate, smooth; branches by twos or threes, wrinkled, knobbed, from upright spreading.—Native of Japan.

4. Quercus Acuta. Leaves oblong, cusped, entire; the younger ones tomentose. Branches knobbed, dotted with white, ash-coloured, smooth, tomentose at the end; spikes of flowers axillary, ferruginous, tomentose.—Native of Japan.

5. Quercus Glauca. Leaves obovate, acuminate, serrate at the tip, glaucous underneath. This is a very large tree, with axillary flowers.—Native of Japan.

6. Quercus Cuspidata. Leaves ovate, cuspid, serrate, smooth; branches striated, smooth, spreading; calix prickly. —The acorns are said to be eaten both raw and dressed in Japan, where it is indigenous.

7. Quercus Serrata. Leaves oblong, serrated, villous and downy, with parallel veins.—Native of Japan.

8. Quercus Dentata. Leaves ovate-oblong, obtuse, gash-toothed, tomentose underneath.—Native of Japan.

9. Quercus Ilex; *Evergreen Holm Oak Tree.* Leaves evergreen, lanceolate or oblong, tomentose underneath; calices ciliate; nut ovate; bark even. It usually forms a large bushy tree, but sometimes rises with a straight and naked trunk, and round head, to a great height. There are several varieties, differing greatly in the size and shape of their leaves; but they will all arise from acorns of the same tree. Some great authorities praise the timber of this tree: Evelyn describes it as serviceable for stocks of tools, mallet heads, chairs, axle-trees, wedges, beetles, pins, and palisadoes in fortifications: it supplies almost all Spain with the best and most durable charcoal. Mr. Boutcher asserts, that these trees soon form warm and lofty hedges, forty or fifty feet high; but that they should not be planted near the house or in the gardens, because they make a great litter in April and May, when they cast their old leaves.—Native of the south of Europe, Cochin-china, and Barbary.

10. Quercus Gramuntia; *Holly-leaved Evergreen Oak Tree.* Leaves roundish, ovate, cordate at the base, sinuate, tooth-letted, pungent, waved, tomentose underneath; antheræ roundish. This is rather a small straggling tree, with numerous round gray branches, downy when young. It flowers in June.—Native of the south of France.

11. Quercus Ballota. Leaves evergreen, elliptic, tooth-letted or entire, tomentose underneath; acorn very long. The acorns are eaten, and are palatable both raw and roasted. The wood being compact and very hard, is used for many purposes.—Native of Barbary, and probably of Spain.

12. Quercus Cornea. Leaves oblong-ovate, repand, serrate. This is a large tree, with ascending branches. The wood is very hard, heavy, and brown.—Native of lofty forests in China, and Cochin-china.

13. Quercus Concentrica. Leaves lanceolate-ovate, quite entire, incurved; calices loose, very short, excavated, with concentrical circles. This is a lofty tree, with ascending branches. Leaves scattered, stalked, smooth on both sides; acorns oblong-ovate, red. This species seems to resemble the second species in the leaves, yet differs in their curvature, and in the cup. Both it and this, together with the ninth species, afford excellent timber for ship-building, and for all domestic and rural purposes; but the twelfth is superior to them all for bearing great weights.—Native of the lofty forests of Cochin-china.

14. Quercus Suber; *Cork-barked Oak,* or *Cork Tree.* Leaves evergreen, ovate-oblong, tomentose underneath, waved; bark cloven, fungose. There are two or three varieties of the Cork-tree; and the acorns are in all of them very like those of the Common Oak. The exterior bark is the cork, which is taken from the tree every eight or ten years; but there is an interior bark which nourishes them, so that stripping off the outer bark is so far from injuring the trees, that it is necessary to continue them; for when this bark is not removed, they seldom last longer than fifty or sixty years in health, whereas trees which are barked every eight or ten years will live a century and a half. The bark of a young tree is porous, and good for little; however, it is necessary to take it off when the trees are twelve or fifteen years old, for without this the bark will never be good. After eight or ten years it will be fit to take off again; but this second peeling is of little use: at the third peeling the bark will be in perfection, and will continue so for a hundred and fifty years, for the best cork is obtained from old trees. The time for stripping the bark is in July, when the second sap flows plentifully: the operation is performed with an instrument like that which is used for stripping Oak. The uses of cork are multifarious: fishermen and liquor dealers cannot carry on trade without it; and probably if persons in the decline of life were to expend upon cork-soles to their shoes the money laid out in snuff and tobacco, they would suffer little or nothing from rheumatic attacks, and live many years longer in this variable climate, besides being less disgusting to the cleanlier members of society. The Germans call it *Pantoffel-holts,* or Slipper-wood, from its lightness; but it is its impenetrability by moisture, that makes it so excellent for the soles of shoes. Its lightness, only, caused it to be preferred by the Venetian females, for the silly purpose of elevating their heels, in order to ape the stature of the men: this Evelyn seriously calls, "affecting or usurping an artificial eminency, which nature has denied them; though it rather deserves to be laughed at, than seriously condemned. The poor people in Spain lay broad planks of it by their bedsides, as carpets to tread upon; and sometimes they line the walls and insides of their stone houses with this bark, which

renders them very warm, and corrects the moisture of the air. They also employ it for bee-hives; for which purpose the bark of young trees, and of the branches, are rolled into a cylinder by the natives of Barbary.—Native of the south of Europe, and north of Africa.

15. Quercus Coccifera; *Kermes Oak Tree.* Leaves ovate, cordate at the base, tooth-spiny, smooth on both sides; nut ovate.—This is a tree of small growth, seldom rising above twelve or fourteen feet high. From this species the Kermes, or Scarlet Grain, a little red gall, occasioned by the puncture of an insect called the Coccus Ilicis. These grains appear on the stems and small branches, some near the bottom, but mostly on the upper branches, yet always protected by the leaves, and fixed to the stem by a glue resembling thin white leather, spread over the stem, and covering, like the cup of the acorn, a segment of the grana. The agglutinating coat may be traced through a small hole into the grana, from whence it proceeds, and where it spreads, like the placenta, on the internal surface. These grana are of various sizes, from one-eighth to one-fourth of an inch in diameter, perfectly spherical, and covered with a white powder, which being rubbed off, the surface appears red, smooth, and polished. On the same stem they may be found in several stages, as in tough membranes filled with a red juice resembling blood, but on paper leaving a stain as bright and beautiful as the best carmine. In the second stage, under the first coat or pellicle, is a thin tough membrane enclosing the eggs, then most minute, and scarcely to be distinguished without the assistance of a glass. Between this membrane and the pellicle is the same red liquor, but less in quantity. The pellicle is evidently separated from the inner membrane by what seems to be the viscera and blood-vessels: but near the hole, these two coats adhere closely together. The interior membrane is thin, white, and tough, with a lunar septum forming the ovary, which at first is very small and scarcely discernible, but progressively enlarges, till in the third stage it occupies the whole space; when the tincturing juice disappears, and nothing remains but a great number of eggs. It is clear that the grana, or grains, derive no nourishment from the plant on which it is fixed; and from its position it would appear, that the little animal chooses the prickly leaf of this tree, which resembles the Holly, only for the sake of shelter and protection from birds. With this insect the ancients are said to have dyed cloth of a beautiful colour, called *coccineus* or *coccus*, being different from the *purpura* which the Phœnicians obtained from the shell-fish *murex*, which was neglected in course of time, and the kermes or grana introduced. This last supported its reputation until the discovery of *cochineal;* see *Cactus*. Desfontaines relates, that although this tree abounds in Barbary, and bears great quantities of cocci, yet is it totally neglected by the inhabitants, who actually purchase the very drug with which they dye their woollen cloths red, at an exorbitant rate, from the French merchants.—Native of the south of Europe.

16. Quercus Virens; *Live Oak Tree.* Leaves evergreen, coriaceous, elliptic-oblong, subtomentose underneath, undivided and sinuated; fruit stalked; nut oblong. This rises to the height of forty feet. The grain of the wood is hard, tough, and coarse; the bark is grayish. The acorns are small and oblong, with short cups; they are very sweet, and are eaten by the Indians, who lay them up in store for winter; and draw from them a very sweet oil, little inferior to that of sweet almonds.—It is a native of North America, and very much used there in ship-building.

17. Quercus Prinus; *Chestnut-leaved Oak Tree.* Leaves deciduous, ovate-elliptic, pubescent underneath, deeply-toothed; teeth very wide, blunt, almost equal. There are two varieties of this tree, the largest growing in rich low lands, where they are the largest of all the North American Oaks, and remarkable for the beauty of its form, as well as the large size of its acorns, which are plentiful and sweet, affording a rich food for various animals. The wood is not of a very fine grain, but is very serviceable. It flowers in May and June.

18. Quercus Aquatica; *Water Oak Tree.* Leaves annual, somewhat wedge-shaped, attenuated at the base, lobed, smooth. There is great variety in the leaves of this species.—Native of North America.

19. Quercus Nigra; *Black Oak Tree.* Leaves annual, wedge-form, somewhat cordate at the base, obsoletely lobed; lobes dilated.—This tree grows on poor land in most parts of North America, where it never attains to a large size, and the wood is of little value.

20. Quercus Rubra; *Red Oak Tree.* Leaves annual, smooth on both sides, obtusely sinuate; sinuses divaricating; segments acute, setaceous, mucronate. There are many varieties.—It grows naturally, and to a large size, in North America.

21. Quercus Discolor; *Downy-leaved Oak Tree.* Leaves annual, pubescent underneath, sinuate; sinuses spreading; segments setaceous, mucronate.—Native of North America.

22. Quercus Alba; *White Oak Tree.* Leaves annual, pinnatifid; sinuses narrowed; segments oblong-linear, awnless.—The wood of this tree is preferred in America to any of the other sort, especially for building, being the most durable.

23. Quercus Esculus; *Italian* or *Small Prickly-cupped Oak Tree.* Leaves pinnatifid, pubescent, and smooth; segments lanceolate, acute, rameated, axillary, filiform; acorns oblong; calices muricated. The acorns are sweet, and frequently eaten by the poor in the south of France, who in times of scarcity grind them, and make bread with the flour.—It flowers in May, and is a native of the south of Europe.

24. Quercus Robur; *Common British Oak.* Leaves oblong, smooth, sinuate; lobes rounded; acorns oblong. This famous tree, which affords that most essential article for the construction of our ships of war, its almost everlasting timber, is noted for the slowness of its growth, as well as for the large size to which it attains. It has been remarked, that in fourscore years the trunk has not exceeded twenty inches in diameter, and sometimes not more than fourteen. The age of this tree is generally estimated at three hundred years. Of its bulk, stature, and extent, we have abundant recorded instances. In Worksop park there was a tree spreading almost three thousand yards square, so that nearly a thousand horses might stand commodiously under it at one time. Dr. Plot mentions an Oak at Narbury, which was fifteen yards in girth; and being felled, two men, one on each side, upon a horse, could not see each other. The same author mentions an Oak between Nuneham, Courtney, and Clifton, spreading eighty-one feet, shading in circumference five hundred and sixty yards of ground. Herne's Oak, celebrated by Shakspeare in his licentious play of the *Merry Wives of Windsor*, when last measured, was about twenty-four feet in circumference: it is still said to exist in the little park at Windsor. The remarkable tree in Hainault forest, Essex, called Fairlop Oak, though preserved with all possible care, has been long dead, and is gradually decaying and falling to pieces. The stem once measured thirty-six feet in girth, and the boughs extended above three hundred in circumference. It is observed by Du Hamel, that Oaks in forests being propagated from the acorn, assume so many varieties, that it is difficult to find two resembling each other in every respect. There are also many varieties of Oak, which dealers

in timber, and woodmen, distinguish by their use, qualities, and accidents, and to which they give different names; but these being merely local, and not founded on permanent characters, it is difficult to ascertain them. The wood of the Oak, when of a good sort, is well known to be hard, tough, tolerably flexile, and not easily splintering, strong without being too heavy, and not easily admitting water; for these qualities it is preferred in ship-building, and is also adapted to almost every purpose of the carpenter; it would be difficult to enumerate all the uses to which it may be applied. There is a kind, says Evelyn, so tough and compact, that our sharpest tools will not enter it; and though some trees be harder, yet we find them more fragile, and not so well qualified to support great weights; nor is there any kind of timber more lasting. That which is twined, and a little wreathed, is forced to support burdens for posts, columns, &c. for all which our English Oak is greatly preferable to the French: and it is found that the rough-grained body of a stubbed Oak, is fittest for the case of a cider mill, and such like engines, as best enduring the action of a ponderous rolling stone. For shingles, pales, laths, coopers' ware, clapboard for wainscot, Oak is excellent, and was much esteemed in former times for wheel-spokes, pins, and pegs for tiling. The knottiest is most proper for water-works, piles, &c. because it will drive best, and last longest: and the crooked makes excellent knee-timber in shipping, and for mill-wheels. The particular and most valued qualities of the Oak, says Mr. Gilpin, are hardness and toughness. Box and Ebony are harder, Yew and Ash are tougher, than Oak; but no timber is possest of both these requisites together, in so great a degree, as the British Oak. Almost all arts and manufactures are indebted to it, but in ship-building its elasticity and strength are applied to most advantage. It is not the erect and stately tree that is the most useful in ship-building, but more often the crooked one, forming short turns and elbows, commonly called knee-timber. Nor is it the straight tall stem, with the fibres running in parallel lines, that is the most useful in bearing burdens, but what Shakspeare terms "the unwedgeable and gnarled Oak." It is one of the most picturesque trees that animates our landscapes. It adds new dignity to the ruined tower, and throws its broad arms with equal effect across the purling brook or above the mantling pool. Coppice Oak makes the best hoops. The smaller truncheons and spray, make billet, bavine, and coals, poles, sedgels, and walking-staffs. Of the roots were formerly made hafts for daggers, hangers, and knives, handles for officers' staves, boxes, and mathematical instruments. Oak saw-dust is the principal indigenous vegetable used in dying fustian: all the varieties of drabs, and different shades of brown, are made with Oak saw-dust, variously managed and compounded. Oak-apples are also used in dyeing, as a substitute for galls; the black obtained from them, by the addition of copperas, is more beautiful than that from the oriental galls, but not so durable. The galls upon the leaves, are occasioned by a small insect, called *Cynips Quercifolii*, which deposits an egg in the substance of the leaf, by making a small perforation on the under surface. As a medicine, they are to be considered as applicable to the same purposes as Oak-bark, and, by possessing a greater degree of astringent and styptic power, seem to have an advantage over it, and to be better suited for external use. Reduced into fine powder, and made into an ointment, they have been found of great service in hæmorrhoidal affections. The bark is universally used to tan leather; and an infusion of it, with a small quantity of copperas, is used by the common people to dye woollen of a purplish blue, and the colour, though not very bright, is durable. The Scotch Highlanders use it to dye their yarn of a brown colour; and a herdsman there, would think himself and his flock unfortunate, if he had not a staff of this wood. The saw-dust, and even the leaves, may be used for tanning; but they are much inferior to the bark, for that purpose. The leaves are very subject to be covered with a sweet viscid juice, called honey-dew, which bees and other insects are very fond of; the larvæ of many insects feed upon the leaves: which, if they can be obtained in great quantities, may be dried and used for litter. By some persons the leaves are preferred to dung, for making hot-beds for melons, and may probably be used with success instead of the bark in tanning. Acorns were of considerable importance formerly, when a great proportion of this island was forest, for feeding swine. About the end of the seventh century, king Ina, among the few laws which he made, to regulate the simple economy of our Saxon ancestors, gave particular directions relating to the fattening of swine in woods, since his time called pawnage or pannage. The astringent effects of the Oak were well known to the ancients, by whom different parts of the tree were used; but it is the bark which is now employed in medicine. To the taste, it manifests a strong astringency, accompanied with a moderate bitterness, qualities which are extracted both by water and spirit. Like other astringents, it has been recommended in agues, and for restraining hæmorrhages, alvine fluxes, and other immoderate evacuations. A decoction of it has likewise been advantageously employed as a gargle and fomentation. Dr. Cullen frequently employed the decoction with success, in slight tumefactions of the mucous membrane of the fauces, and other disorders arising from cold; which, when it was early applied, were often prevented. Dr. Cullen almost constantly added a portion of alum to these decoctions, but he did not find a solution of alum alone so effectual. Some have supposed that this bark is not less efficacious than that of the Cinchona, especially in the form of extract; but this opinion now obtains few supporters, though there is no doubt that Oak-bark will cure intermittents, both alone and joined with Chamomile flowers.—*Propagation and Culture of the Oak.* All the sorts of Oak are propagated by sowing their acorns, and the sooner they are put into the ground after they are ripe, the better they will succeed; for they are very apt to sprout, if spread thin; and if laid in heaps, will ferment and rot in a little time: the best season therefore for sowing them is in the beginning of November, by which time they will have fallen from the trees. This early sowing seems to be the most natural, but the destruction occasioned by field-mice has induced many to prefer spring-sowing: and seedsmen who adopt that plan preserve the vegetative power of their acorns through the winter, by laying them thinly upon a boarded floor, taking care that they are first fully ripe. Mr. Miller gives the following directions for raising the several sorts of Oak in a nursery, when they are intended to be planted out for ornament only. The acorns should be sown in beds four feet wide, with paths of two feet broad between them; in these beds there may be four rows sown, at about nine inches distance from each other, though some allow only four inches between the rows. Draw straight drills with the hoe, into which drop the acorns, two or three inches apart, covering them carefully with the earth two inches thick. In the spring, when the plants begin to appear, clear them carefully from weeds; and if the season prove dry, refresh them now and then with a little water. Let them remain until the following autumn; at which time have a spot of ground, in size proportioned to the quantity of plants, well trenched and levelled; at the middle or end of October carefully take up the plants, so as not to injure their roots, and plant them

out in rows, three feet asunder, and eighteen inches apart in the rows; never suffering the plants to abide long out of the ground, that the roots may not become dry. This work may be done in March, if there was not time for it in autumn. Deep-trenching or double-digging being very expensive, those who plant on a large scale may take a crop of Oats, Rape, or Turnips, off the land, the year before they plant; by which means the sward may be effectually destroyed, and the land cleaned. After the crop is off, let the ground be trench-ploughed, and then harrowed with heavy harrows. About the end of October, let it be again ploughed cross-wise, and harrowed as before, previous to the planting of the sets. In planting these, having taken them carefully out of the seed-bed, Hunter, in his *Evelyn*, advises to shorten the tap-root, and take off part of the side-shoots. Each line should have a man and boy: the man strikes his spade into the earth, close to the line; he gives another stroke at right angles with it; then the boy, having a parcel of plants under his left arm, takes one with his right hand, and puts it into the crevice made by the spade at the second stroke; after this, the man gently presses the mould to it with his foot. An active man and boy will thus plant fifteen hundred or two thousand in a day, and while they are planting, others should be employed in taking up fresh sets, sorting them, and preparing the roots. There should be a sufficient number of hands, for the ground cannot be too soon planted when it is ready; neither can the plants be put in too soon after they are taken up; and the weakest may be left a year longer, to regain their strength. When they have taken root in the nursery, they will require little more care than to keep them free from weeds, and dig the ground between the rows every spring; in doing which, you should cut off such roots as extend very far from the trunks of the trees, which will render them better for transplanting again. Prune off also all such side-branches as extend themselves very far, and retard the upright shoot; but on no account cut off all the small lateral branches, some of which are absolutely necessary to be left on to detain the sap for the augmentation of the trunk. When these trees have remained in the nursery three or four years, they will then be large enough to transplant to the places where they are to remain, for it is hazardous to let them grow very large before they are planted out, especially after they have taken deep root.—The above directions are designed for small plantations for pleasure only, in a garden or park; we shall now subjoin the directions and observations of the most experienced planters concerning that most important national concern, the cultivation of Oak for timber. Where these trees, says Mr. Miller, are cultivated with a view to profit, the acorns should be planted where the trees are designed to grow; for those which are transplanted will never grow to the size of those which are sown, nor yet last so long sound. The first thing is, to prepare the ground by feneing it, to keep out cattle, hares, and rabbits, which would soon destroy all the young trees; for though the plants will in a few years grow out of danger from hares and rabbits, as it will be many years before they are past injury from cattle, durable fences should be put round the ground. If in the beginning, a pale-fence is made about the land, which may be close at the bottom, and open above, and within the pale a quick-hedge is planted; this will become a good fence, by the time the pale decays, against all sorts of cattle, by which time the trees will be too hard for hares and rabbits to gnaw. After the ground is well fenced, it should be prepared three or four times, and harrowed well after each ploughing, to break the clods, and to cleanse the grounds from Couch, and the roots of all bad weeds. Indeed, if the ground be green-sward, it will be better to have one crop of Beans, Pease, or Turnips, off it, before the acorns are sown, especially if these crops be well hoed, to stir the surface and destroy the weeds. But the ground should be ploughed as soon as possible after the crop is taken off, to prepare it for the acorns, which should be sown as soon as possible after they are ripe. This, with all its risk, Mr. Miller thinks is the best plan. In choosing the acorns, all those should be preferred which are taken from the largest and most thriving trees. Those from pollard-trees should always be rejected. The season for sowing the acorns being come, and the ground having been ploughed, and levelled smooth, the next work is to sow the acorns, which must be done by drawing drills across the ground, at about four feet asunder, and two inches deep, dropping the acorns into them six or eight inches asunder. These drills may be drawn either with a drill-plough, or by hand with a hoe; but the former is the most expeditious method, and should be preferred in large plantations. In drawing the drills, where the land slopes to one side, they should be made the same way as the ground slopes, that there may be no stoppage of the wet by the rows of plants crossing the hanging of the land. This should be particularly observed in all wet ground, or where the wet is subject to lie in winter, but in dry land it is not of much consequence. When the acorns are sown, the drills, should be carefully filled in, so as to cover the acorns securely, for if any of them are exposed, they will entice the birds and mice; and if either of these once attack them, they will make great havock. Drills made at this distance will allow of stirring the ground between the rows, and also of weeding, without which it cannot be expected that the young plants can make much progress. Whoever, Mr. Miller insists, hopes to have success in their Oak plantations, should determine to keep them clean for eight or ten years after sowing, by which time the plants will have acquired strength enough to keep down the weeds: and it is nothing but the entire neglect of this which has caused so many plantations to miscarry. About the middle of April, the young plants will appear above the ground; but before this, if the ground should produce many young weeds, it will be good husbandry to scuffle the surface over with Dutch hoes in a dry time, at the latter end of March or the beginning of April, just before the plants come up. In the first summer, while the plants are young, it will be the best way to perform those hoeings by hand, but afterwards it may be done with the hoe-plough; for as the roots are to be placed four feet asunder, there will be room enough for this plough to work; and as this will stir and loosen the ground, it will be of great service to the plants: but there will require a little hand labour even where the plough is used, in order to destroy the weeds which will come up in the rows between the plants, for these will be out of the reach of the plough; and if they are not destroyed, they will soon overgrow and bear down the young plants. After they have grown two years, it will be proper to draw out some of them, where they grow too close; but in doing this, especial care must be taken not to injure the roots of those left, for as the plants to be drawn out will afterwards be only fit for pleasure plantations, they should be always sacrificed, wherever it will ensure the safety of those which are to remain. In the thinning of these plantations, the plants may at the first time be left about one foot asunder, which will give them room enough to grow two or three years longer, by which time it may be easy to judge which are likely to make the best trees, which may then be marked to remain; and it will be prudent to mark double the desired number, to provide against unexpected failure. If at this second thinning they be left four

feet distant in the rows, they will have room enough to grow three or four years longer; by which time, if the plants have made good progress, their roots will be spread over the ground, and render it proper to take up every other tree in the rows. The best plants should, however, be allowed to stand, whichever row they may be in, or if they should not stand exactly at the distance here assigned; all that is designed here being to lay down general rules, which should be as nearly complied with as the plants will permit: hence every one should be guided by the growth and appearance of the young trees. When they have been reduced to the distance of about eight feet, they will not require any more thinning. But in two or three years those which are not finally to remain, will be fit to cut down to make stools for underwood; and those which are to remain, will make such progress as to become a shelter to each other; for this is what should be particularly attended to whenever the trees are thinned. Hence, in all places much exposed to the wind, the trees should be thinned with great caution, and by slow degrees; for if the air be let too much at once into the plantation, it will give a sudden check to the trees, and greatly retard their growth; but in sheltered situations there need not be so great caution used as in open places. The proper distance at which trees designed to furnish timber should remain, is from twenty-five to about thirty feet; this will not be too near where they thrive well, in which case their heads will spread so as to meet in about thirty or thirty-five years; nor will this distance be too great, so as to impede the upright growth of the trees. This distance is intended, that the trees should enjoy the whole benefit of the soil; therefore, after one crop of the underwood, or at most two crops, are cut, the stools should be stubbed up, that the ground may be entirely clear for the advantage of growing timber, which is what should be principally regarded: but in general most people have more regard for the immediate profit of the underwood than the future good of the timber, and by so doing frequently spoil both; for if the underwood be left after the trees are spread so far as that their heads meet, the underwood will not be of much worth, and yet by their stools being left they will retard the progress of the timber-trees by absorbing their nourishment. The soil in which the Oak makes the greatest progress, is a deep rich loam, in which the trees grow to the largest size; and the timber of those trees which grow upon this land is generally more pliable than that which grows on a shallower or drier ground; but the wood of the latter is compact and hard. Indeed there are few soils in England in which the Oak will not grow, provided there be due care taken in their cultivation, though this tree will not thrive equally in all soils; but yet it might be cultivated to a national advantage upon many large wastes in several parts, as well as to the improvement of the estates, part of which lie uncultivated, and produce nothing to the owner. The cutting down Oaks in the spring of the year, at the time when the sap is flowing, is very injurious: it is done merely for the sake of the bark, which will then easily peel off. But the timber is not half so durable as that felled in the winter; so that ships built of this spring-cut timber have decayed more in seven or eight years, than others, built with timber cut in winter, have done in twenty or thirty. In raising Oaks for timber, draining should be well attended to, nothing contributing more to their growth and health than keeping the land dry, if it be in the least degree swampy. The Oak flourishes best, and grows quickest, in a rich deep loam; it will also grow exceedingly well on clays and sandy soils; and on the last kind of soil the finest-grained timber is produced. There can certainly be no harm in taking the acorns from flourishing healthy trees, if taken when they are full ripe, and beginning to fall: if a small quantity only be required, those which may be easily shaken from the trees should be preferred. Evelyn says, that six bushels of acorns will plant an acre, at the distance of one foot from each other. Two bushels, therefore, which some recommend as sufficient, must be much under the mark, unless sown with the seeds of other trees for a mixt wood or coppice. One of the most essential things to be observed in the management of Oak-woods, is the judicious thinning of them, as before directed.—The striped variety of the Oak is propagated by budding or grafting on the common sort; it is a beautiful variegation, and may be improved by joining it to the Scarlet, Virginian, or Chestnut-leaved. The more tender sorts will become hardier, and the dwarfs improve in size, by grafting or budding on the Common Oak. For further particulars on this interesting and most important subject, see the articles *Timber* and *Woods*.

25. Quercus Infectoria; *Oriental Gall Oak Tree*. Leaves ovate-oblong, very smooth on both sides, deeply toothed, deciduous; fruit sessile; calix tessallated; nut oblong, nearly cylindrical.—This Oak is scattered throughout all Asia Minor: it seldom attains the height of six feet, and the stem is crooked, with the habit of a shrub, rather than a tree. The galls produced on the young branches, from the puncture of a species of *Diplolepis*, are preferred to all others for dyeing, and are a great article in the Levant trade.

26. Quercus Ægilops; *Great Prickly-cupped Oak Tree*. Leaves ovate-oblong, tomentose underneath, sinuate, repand; segments acuminate: calices very large, scaly, squarrose. This is one of the handsomest species of Oak, but is not so lofty as some species; the branches extend very wide on every side, and are covered with a grayish bark intermixed with brown spots.—Native of the Levant, whence the acorns are annually brought to Europe for dyeing.

27. Quercus Cerris; *Turkey Oak Tree*. Leaves sinuate, pinnatifid, pubescent underneath; segments sharpish; raments axillary, filiform; calices echinate ramentaceous. A tall handsome tree.—Native of the south of Europe.

28. Quercus Heterophylla. Leaves petioled at considerable length, ovate-lanceolate, oblong or entire, or unequally large-toothed; acorn-cup hemispherical; gland subglobose.—Grows on the banks of the Delaware, Pennsylvania. Pursh observes, that there is only one individual of this singular species known, which grows on the plantation of the Messrs. Bartrams, near Philadelphia. Michaux considers this tree to be a distinct species; but Pursh is inclined to rank it among the hybrid plants.

29. Quercus Ambigua. Leaves sinuate, glabrous, acute at the base; sinuses subacute; acorn-cup subscutellated; gland turgidly ovate.—Grows on Hudson's Bay, and in Nova Scotia. This tree is called Gray Oak by Michaux.

30. Quercus Oliviæformis. Leaves oblong, glabrous, glaucous on the under side, deeply and unequally sinuate-pinnatifid; fruit elliptic-ovate; acorn-cup deeply cratered, crinited on the upper side; gland elliptic-oval.—Grows on the banks of Hudson's river, and the western parts of New York. It is also found in Pennsylvania and Virginia, on iron-ore hills.

Queria; a genus of the class Triandria, order Trigynia.—Generic Character. *Calix:* perianth five-leaved, erect; leaflets oblong, acute, permanent; the outer ones recurved. *Corolla:* none. *Stamina:* filamenta three, capillary, short; antheræ roundish. *Pistil:* germen ovate; styles three, the length of the stamina; stigmas simple. *Pericarp:* capsule roundish, one-celled, three-valved, (the second species valve-

less.) *Seed:* single. Essential Character. *Calix:* five-leaved. *Corolla:* none. *Capsule:* one-celled. *Seed:* one. ——The species are,

1. Queria Hispanica. Flowers in clusters. A diminutive hardy annual, flowering most part of the summer; colour of the plant whitish.—Native of Spain.

2. Queria Canadensis. Flowers solitary; stem dichotomous. Root fibrous, perennial; seed reniform-globular, very smooth, shining, dark; leaves opposite, lanceolate, ovate, quite entire, with dusky spots scattered over them on each side; stem solitary, a span high, round, jointed, smooth, reddish, erect, an leafy.—Native of dry lime-stone hills from New York to Kentucky, flowering from June to August.

3. Queria Trichotoma. Flowers in racemes; stem trichotomous.—Native of Japan.

Quick. See *Triticum.*

Quick—generally means a live hedge, of whatever plants composed; in contradistinction to that which is formed of stakes, &c. and therefore called a dead one. It more particularly applies to the Hawthorn, or Whitethorn, (see *Cratægus Oxycantha,*) young plants, or sets of which, are sold under this name by the nursery-gardeners, for the purpose of planting to form live hedges. In choosing these sets, prefer those out of the nursery, because such plants as are taken out of the wood seldom have good roots. It would indeed be better still, to sow the seeds or haws in the place where the hedge is wanted, as the plants would form a much stronger and more durable fence than after having undergone transplantation. This practice would be generally resorted to, but it is condemned as tedious; though, if the haws were only buried a year in the ground to prepare them for vegetation before sowing, they would form a good fence much sooner than is imagined. In some trials of this kind, plants that have remained where they came up from seed, have in five or six years overtaken those which were transplanted at two years old, when the former were only just sown. When the hedges are raised from seed, it will not be amiss to mix the Holly berries with the haws, and they also should be one year previously buried to prepare them, so that then both will come up together in the following spring; and this mixture, of Holly with the Quick, will not only have a beautiful appearance in the winter, but will also thicken the hedge at the bottom, and make it the better fence. But where the hedge is to be planted, the sets should not be more than three years old from the haws; for when they are older, their roots will be hard and woody: and as they are commonly trimmed off before the sets are planted, so they very often miscarry, and such of them as do live, will not make such good progress as younger plants, nor are they so durable; for these plants will not bear transplanting so well as many others, especially when they have stood long in the seed-bed unremoved. Quick does well on good stong land; but on dry, gravelly, or poor soils, it seldom prospers. The reasons of this are: first, that the sets are placed too low or flat on the surface, whence their roots only occupy a little depth of the soil; secondly, when set higher, they are generally too near the slope of the bank, and do not receive the benefit of the rain. To remedy these inconveniences, two lines may be marked out, twelve feet from each other; from three feet within each line the upper part of the soil is to be taken, and cast into the centre of the space, so as to form a flat bed three feet broad, in the middle of which the Quicks are to be planted; the remaining eighteen inches on each side is to be filled up with earth, gravel, or sand, taken out of the ditches: this extends the bed to five feet, allowing six inches for the slope of the bank: the Quicks planted in this body of soil will find sufficient nourishment before the tap-root reaches the barren gravel below; and the earth thus placed, especially if the bed be laid concave, or sloping a little in the middle, will retain sufficient moisture to nourish the plants, and they will soon form a fence. By raising the bank on each side at pleasure, the plants may be defended from sharp winds or the sea air. The space required is no great object on low-priced land, and a good thriving hedge is an ample compensation. On such dry soils, Furze, called also Gorse and Whins, is propagated easily from seed, grows fast, and, when sown in a triple row, makes a very formidable fence; but as it is liable to be completely cut down by a severe winter, no dependence can be placed on it, except as a temporary defence, during the minority of the Whitethorn. The nursing of young Quick hedges, by proper training and weeding, has been greatly neglected. The luxuriant side-shoots should be taken off, which will promote the upright growth of the plant, by training it to a single stem. One advantage of this method is, that of rearing every plant with a degree of certainty, the tops being in this operation attended to as well as the stems; those of the stronger plants being lessened, to give head-room to the weaker. Another great advantage, especially on a sheep-farm, is that of getting the young plants out of harm's way. Sheep are great enemies to young Quick, and every expedient should be employed to defend it from them for three or four years; after which they will, by the above management, rise out of the reach of those animals. The pruning should be performed in winter or spring, while the sap is down. Young Quick hedges should be kept constantly free from weeds, and, if foul, should be hoed and weeded by hand twice every year; otherwise, if the weeds be numerous and strong enough to outgrow the shoots, the latter will be greatly injured. Root or perennial hedge weeds should be carefully eradicated; as, the Common Creeping Thistle, Docks, Nettles, Bindweeds, and Fern; in moist situations, the Meadow Sweet and Willow Herbs, but especially the Persicarias, which are almost certain suffocation to weak plants in the first and second years, if not removed by hand. Grasses in general may be destroyed by the hoe, but scarcely any means can entirely free young hedges from Quick-grass or Couch; which ought therefore at almost any cost to be destroyed before the young hedge is planted. Cleavers, otherwise called Hariff, and other climbing plants, are a burden to the taller and more upright shoots. Biennial and annual weeds, such as Sowthistles, the Hawkweed, and several other umbelliferous plants, provincially called Keksies, also Charlock, and several of the Wild Vetches, with a variety of small weeds, which rob the plants of their nourishment, all ought to be cut off with the hoe as often as they rise, or at least before they come to seed. Great care is requisite in weeding young hedge-shoots: they are very brittle, and roughness in handling is very liable to break them off at the stub. They ought not to be pulled aside nor weeded overhand; but the weeds should be drawn out at the bottom, by putting the hand or fingers gently in between the stubs. For further particulars, see the articles *Fences* and *Hedges.*

Quicken Tree. See *Sorbus Aucuparia.*

Quillwort. See *Isoetes.*

Quince Tree. See *Pyrus Cydonia.*

Quinchamala; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth superior, of one leaf, in four deep, ovate, unequal segments; one larger than the rest. *Corolla:* of one petal; tube funnel-shaped, much longer than the calix, quadrangular, curved; limb in five lanceolate, acute, spreading segments. *Stamina:*

filamenta five, very short, inserted into the top of the tube; antheræ oblong, the length of the limb. *Pistil:* germen roundish; style thread-shaped, the length of the tube; stigma capitate. *Pericarp:* berry roundish. *Seed:* solitary. Essential Character. *Calix:* in four unequal segments, superior. *Corolla:* funnel-shaped, five-cleft. *Stigma:* capitate, undivided. *Berry:* dry.——The only known species is,

1. Quinchamala Chiliensis. Root annual, composed of a few simple yellow fibres; stems several, prostrate, simple, round, leafy, four to six inches long; leaves alternate, linear, acute, quite entire; flowers corymbed. The Indians take a decoction of this plant for internal disorders.—Native of Chili.

Quisqualis; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth filiform, very long, tubular, with a five-cleft patulous mouth, deciduous. *Corolla:* petals five, inserted into the jaws of the calix, sessile, oblong, blunt, spreading, larger than the border of the calix. *Stamina:* filamenta ten, bristle-shaped, inserted into the jaws of the calix, five of them lower; antheræ oblong, in the jaws of the calix. *Pistil:* germen ovate; style filiform, longer than the stamina; stigma obtuse, wider. *Pericarp:* drupe dry, five-cornered. *Seed:* nut roundish. Essential Character. *Calix:* five-cleft, filiform. *Petals:* five. *Drupe:* five-cornered.——The single species known is,

1. Quisqualis Indica. Leaves opposite, petioled, cordate or ovate, quite entire; branches round, pubescent. Loureiro describes it as a large unarmed shrub, with a thick, almost upright stem, and climbing branches; the flowers white, tinged with red, in terminating corymbs.—Native of the East Indies, China, and Cochin-china.

RAN

RADISH. See *Raphanus.*

Radish, Horse. See *Cochlearia.*

Ragged Robin. See *Lychnis.*

Ragwort. See *Othonna, Senecio,* and *Solidago.*

Rajania; a genus of the class Diœcia, order Hexandria.—Generic Character. *Male. Calix:* perianth six-parted, bell-shaped; leaflets oblong, acuminate, more spreading above. *Corolla:* none. *Stamina:* filamenta six, bristle-shaped, shorter than the calix; antheræ simple. *Female. Calix:* perianth one-leafed, six-parted, bell-shaped, permanent, shrivelling. *Corolla:* none. *Pistil:* germen inferior, compressed, one side augmented with a prominent rim, three-celled; styles three, the length of the calix; stigmas blunt. *Pericarp:* capsules membranaceous, three-celled, valveless, crowned with the calix; two of the cells barren, almost obliterated, wingless; the third fertile, compressed, extended into a very large, half-ovate, membranaceous, wing. *Seed:* single, subelliptic, compressed. Essential Character. *Calix:* six-parted. *Corolla:* none. *Female. Styles:* three. *Germen:* inferior, three-celled, with two of the cells obliterated. *Capsule:* membraneous, with one wing. *Seed:* solitary.——The species are,

1. Rajania Hastata. Leaves hastate, cordate. Root large and ovate, sometimes four or five inches long, and two thick, rounded at each end, the flesh very white, tasting like a bean; stem long, slender, knotty, climbing; leaves scattered, about three inches long; flowers small, whitish, in simple, axillary, drooping clusters.—Native of St. Domingo.

2. Rajania Cordata. Leaves cordate, seven-nerved.—Native of South America.

3. Rajania Angustifolia. Leaves linear-lanceolate, rounded at the base, three-ribbed. It flowers in May, and seeds in June.—An annual plant, and is found in the driest coppices of Hispaniola, on the western coast, climbing up the tall trees.

4. Rajania Ovata. Leaves ovate-acuminate, three-nerved.—Native of Hispaniola.

5. Rajania Quinquefolia. Leaves in fives, ovate-oblong; clusters lateral, between the joints.—Native of the W. Indies.

6. Rajania Quinata. Leaves quinate; leaflets emarginate; flowers umbelled, axillary.—Native of Japan.

7. Rajania Hexaphylla. Leaves serrate; leaflets oblong, acute; flowers in racemes, snow-white.—Native of Japan.

Rampions. See *Campanula.*

Ramsons. See *Allium.*

Ranunculus; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* perianth five-leaved; leaflets ovate, concave, coloured, a little deciduous. *Corolla:* petals five, blunt, shining, with small claws; nectary a little cavity just above the claw, in each petal. *Stamina:* filamenta very many, shorter by half than the corolla; antheræ oblong, blunt, twin. *Pistil:* germina numerous, collected into a head; styles none; stigmas reflex, very small. *Pericarp:* none; receptacle collecting the seeds by very minute peduncles. *Seeds:* very many, irregular, varying in figure, naked, with a reflex point. *Observe.* The essence of this genus consists in the nectary; the other parts of the fructification are always inconstant. This nectary is in some species a naked pore; in others, encompassed by a cylindrical border; and in others, again, closed by an emarginate scale. The ninth species has a three-leaved calix, and more than five petals. The sixteenth has an awl-shaped receptacle, and the fruit in a spike. The forty-third has an ensiform tail to the seeds, and the calix appendicled at the base. The forty-fourth has only five stamina. In some species the seeds are roundish, in others depressed; sometimes they are beset with prickles like a hedge-hog, and sometimes they are but few in number. Essential Character. *Calix:* five-leaved. *Petals:* five to eight, with a honied pore at the claw. *Seeds:* naked.——The species are,

* *With simple Leaves, and undivided.*

1. Ranunculus Flammula; *Lesser Spearwort.* Leaves ovate-lanceolate, bluntish, petioled; stem declined. Root perennial, composed of simple, very long, and rather large fibres. This species varies wonderfully in magnitude, and in gravelly soils degenerates to a trailing dwarfish size, with linear leaves. Flowers numerous, solitary, on long stalks, of a bright golden yellow. The plant is very acrid; and when externally applied, inflames and blisters the skin. Its acrimony rises in distillation. Many years ago, a man travelled in different parts of England, administering vomits, which, like white vitriol, operated the instant they were swallowed. The distilled water of this plant was his medicine; and Dr. Withering declares, from the experience he himself had of it, that in case of poison being swallowed, or other circumstances occurring in which it is desirable to make the patient instantly vomit, that he found it preferable to any other medicine yet known, as it did not excite those painful contractions which sometimes attend the white vitriol, and defeat the intention for which it was given. It is used, in many parts of the Highlands of Scotland, to raise blisters; for this purpose the leaves are well bruised in a mortar, and applied in one or more limpet shells, to the part where the blisters are to be

raised. This is the practice in the Isle of Skye, and other places, especially in the wet and boggy parts of heaths and commons, where it flowers from June to September. It is found also in Sweden, Russia, Switzerland, and Germany, on the banks of lakes.

2. Ranunculus Lingua; *Great Spearwort.* Leaves lanceolate, acuminate; stem erect, many-flowered. This also is an acrid herb, with a perennial root like the preceding; and likewise varies with serrate leaves. The flowers are large, and of a bright golden colour. It flowers in July, and generally grows in muddy ditches or bogs by the sides of lakes. It is reckoned rather a rare plant in England, but occurs in many places, as between Rotherhithe and Deptford, near London; on Iver heath near Uxbridge; in several parts of Norfolk; on Feversham Moor, near Cambridge, and in the isle of Ely; at Goldington and Oakley in Bedfordshire; in ditches near a pool of water called Brayford in Lincolnshire; on the banks of the Cherwell near King's Mill, in Oxfordshire; in the bogs on Malvern Chase, Worcestershire; in Kiveson Pool, near Stafford; on the sides of Ancott Pool in Salop; in several parts of the north of England and Scotland; at Duddington Loch, near Edinburgh; and about Restennet in Angus-shire.

3. Ranunculus Nodiflorus. Leaves ovate, petioled; flowers sessile.—This is found about Paris, and in the marshy places of the island of Sicily.

4. Ranunculus Gramineus; *Grassy Crowfoot.* Leaves linear-lanceolate, many-nerved, sessile; stem upright, few-flowered, very smooth; root perennial. It is distinguished from the next species by its yellow flowers and tuberous root. —Native of mountainous situations in the south of France. It flowers in April and May; and is easily propagated by parting the roots in autumn.

5. Ranunculus Pyrænеus; *Pyrænean Crowfoot.* Leaves linear, undivided; stem upright, striated, subbiflorous. Root bulbous; flowers white.—Native of the Alps, Pyrenees, and Switzerland, Carinthia, Dauphiny, &c.

6. Ranunculus Parnassifolius; *Parnassia-leaved Crowfoot.* Leaves subovate, nerved, marked with lines, quite entire, petioled; flowers umbelled, of a brilliant white colour. It varies with a stem scarcely two inches high, with only one, two, or three flowers at most.—Native of the south of Europe, in alpine situations. It may be easily propagated, by parting the roots in autumn.

7. Ranunculus Amplexicaulis; *Plantain-leaved Crowfoot.* Leaves ovate, acuminate, embracing; stem many-flowered; roots in bundles. In colour, the leaves differ from most others of the genus, being of a grayer or more glaucous hue, which, joined to the delicate whiteness of the flowers, renders this species very desirable in a collection of hardy herbaceous plants, more especially as it occupies little space, may be easily propagated by parting its roots in autumn, and has no tendency to injure the growth of others.—It flowers in April and May, and is a native of the Appennine and Pyrenean mountains.

8. Ranunculus Bullatus; *Portugal Crowfoot.* Leaves ovate, serrate; scape naked, one-flowered.—Native of Portugal, the Isle of Candia, and Barbary.

9. Ranunculus Ficaria; *Pilewort*, or *Lesser Celandine.* Leaves cordate, angular, petioled; petals numerous. This plant is easily distinguished by its roots, formed of many knobs or tubers, shaped like the Fig; hence its trivial name. The tops of these tubers send forth many small fibres. The whole plant is smooth. It differs from the Crowfoots in the number of the petals in the corolla, and leaflets in the calix, yet agrees with them in the same general nature and habit, as well as in the nectary or little scale at the base of the petals, so that it seems to be of the same natural genus with them. In the spring, almost every grove, thicket, and hedge-bottom, is enamelled with the glossy golden flowers of this plant; but when they have been exposed a few days to the bright sun, they become white, and fall off soon afterwards. It blows earlier than the Crowfoots, and is therefore liable to have its parts of fructification injured by the inclemency of the weather; to secure it from which, it has the power of closing its petals in a much greater degree, and in this state it is usually found from five in the evening till nine in the morning, and in wet weather. At its first appearance in the spring, this plant is small, and extends but little; but in the month of May, particularly by the side of moist ditches, it grows much more luxuriantly, and in this state puts forth small bulbs like grains of wheat from the bosoms of the leaves: these, as the stalks lie on the ground, get into the earth, and become the tuberous roots of young plants. Thus the plant readily propagates itself; and this providential provision is the more necessary, because the seeds usually prove abortive. Linneus says, that the young leaves, boiled as greens in the spring, are eaten by the common people in some parts of Sweden. Though it is milder than most of the genus, it retains something of that acrimony which many of the species possess in a high degree. The particular form of the roots probably recommended this plant as a cure for the piles: and this fancied quality was the origin of the English name. The roots are sometimes washed bare by the rains, and this induced the ignorant and superstitious to imagine that it rained wheat, to which the uncovered tubercles bear a little resemblance. It choaks the plants which grow near it, and ought to be extirpated, as cattle will not eat it, from our meadows. Nothing discourages its increase more than coal or wood ashes, which are both at the same time excellent dresses for meadow-land. It is sometimes seen in gardens with a double root; and is common in meadows, orchards, and plantations, flowering in February, and continuing through March and a great part of April.

10. Ranunculus Salsuginosus; *Salt-marsh Crowfoot.* Leaves ovate, somewhat cordate, toothed at the extremity; stem creeping, thread-shaped; flowers solitary, yellow, as big as our common Crowfoots. The root sends out many runners.—Found on the banks of the Neva, and in the salt plains of Siberia, beyond the lake Baical.

11. Ranunculus Thora; *Kidney-leaved Crowfoot.* Leaves kidney-form, subtrilobate, crenate; the radical ones on long stalks. Root round, brownish, from one to two inches long, perpendicular, the thickness of a straw, and permanent, in its whole length putting forth many fusiform, long, pale, subimbricate fibres; stem solitary, simple, a span high, terminating in one, rarely more, long-stalked golden flowers, half an inch wide. The root of this plant is said to be extremely acrid and poisonous. It flowers in May and June.—Native of the Alps of Switzerland and Austria; the Pyrenees, Dauphiny, Piedmont, and Silesia.

12. Ranunculus Pusillus; *Diminutive Crowfoot.* Plant glabrous; leaves petiolate; inferior leaves ovate, dentate; superior leaves linear-lanceolate, dentated at the tip; pedunclеs alternate, solitary, one-flowered; petals pale yellow. This is a small species, with exceeding small flowers; and flowers from June to August.—Native of North America.

13. Ranunculus Filiformis; *Slender Creeping Crowfoot.* Plant glabrous, small; stems filiform, creeping, geniculate; joints with one flower each; leaves linear, subulate, obtuse. —Grows in inundated places on the river St. Lawrence, Hudson's Bay, and Labrador, and flowers in June and July.

14. Ranunculus Cymbalaria; *Small Trailing Crowfoot.* Plant glabrous, very small, filiform, creeping, taking root at the joints; leaves cordate-reniform, obtusely quinquedentated; peduncles radical, solitary, for the most part two-flowered; petals linear, pale yellow, and sometimes white; fruit oblong.—Grows in saline marshes near the salt-works of Onondago, New York, and flowers in June and July.

15. Ranunculus Muricatus. Plant without hair, diffuse; leaves simple, subrotund, trilobate; calix of the width of the corolla; flowers yellow.—Grows in the old fields of Virginia and Carolina, and flowers in June and July.

16. Ranunculus Echinatus. Plant without hair, simple; leaves simple, subrotund, trilobate; petals as long again as the calix; flowers yellow, more than twice the size of the preceding one.—Grows in Charleston, South Carolina.

** *With dissected and divided Leaves.*

17. Ranunculus Creticus; *Cretan Crowfoot.* Root-leaves kidney-form, crenate, sublobate; stem-leaves three-parted, lanceolate, quite entire; stem many-flowered. Root perennial, of many thick, tapering, fleshy fibres; stem thick, moderately branched, eighteen inches high, hairy, as well as the rest of the herbage; flowers yellow.—It flowers early in June; and is a native of the island of Candia or Crete.

18. Ranunculus Cassabicus. Root-leaves roundish-cordate, crenate; stem-leaves digitate, toothed; stem many-flowered. Flowers small, yellow.—Native of Germany and Siberia.

19. Ranunculus Auricomus; *Wood Crowfoot,* or *Goldilocks.* Root-leaves kidney-form, three-parted, crenate; stem-leaves digitate, linear; stem many-flowered; calix coloured. Root fibrous, perennial; flowers terminating, erect, solitary, of a bright golden hue, on round pubescent peduncles. In cold backward seasons, in gardens in unsheltered situations, and in more northern countries, the real petals are sometimes wanting, the calix being dilated and more coloured than usual, so as to supply their place. It has been called Goldilocks and Sweet Wood Crowfoot: the epithet Sweet being intended to express that it has none of the acrid or caustic flavour usual in this genus; the term Wood expresses its place of growth. It is easily distinguished from the other Wild Crowfoots, by its yellow patulous calix; the nakedness of its nectary, which is a small oblique hole running downwards at the base of each petal; by the bottom-leaves being less cut, and the upper ones narrower than in most of the others; and by the petals being often wanting. It sometimes has double flowers.—Native of woods and shady places throughout Europe.

20. Ranunculus Abortivus. Root-leaves cordate, crenate; stem-leaves ternate, angular; stem subtriflorous.—Native of Virginia and Canada.

21. Ranunculus Sceleratus; *Marsh* or *Celery-leaved Crowfoot.* Lower leaves palmate; upper digitate; fruits oblong. Root annual, composed of many whitish fibres; herb various in size and luxuriance, of a pale shining green colour, juicy, and very smooth, except the flower-stalks and upper part of the stem, which are occasionally hairy; flowers numerous, peduncled, small, of a palish yellow. This species is easily distinguished by its broad shining bottom leaves, thick stalk, small yellow flowers, and smooth oblong seed-heads. It is one of the most virulent of native plants: bruised and applied to the skin, it soon raises a blister, and creates a sore by no means easy to heal. When chewed, it inflames the tongue, and produces very violent effects.—Common in watery places, in most parts of Europe and North America; flowering and seeding from July to August.

22. Ranunculus Aconitifolius; *Aconite-leaved Crowfoot.* Leaves five-lobed, toothed; lobes acuminate, the intermediate ones trifid; floral leaves digitate, sessile, lanceolate. This is a very handsome species, four feet high, and branched; stem hollow within.—Native of the European Alps. The double-flowering variety has been obtained by seeds, and is preserved in many curious gardens for the beauty of its flowers. Some gardeners call it, Fair Maid of France. The flowers are pure white and very double, each standing upon a short footstalk.—It is easily propagated by parting the roots in autumn.

23. Ranunculus Platanifolius; *Plane-leaved Crowfoot.* Leaves five-lobed, toothed; lobes blunt, the intermediate ones trifid, the upper floral ones digitate, sessile, linear, subulate.—Native of the mountains of Germany and Italy.

24. Ranunculus Illyricus; *Illyrian Crowfoot.* Leaves silky, villose; ternate leaflets trifid, gashed, quite entire; calix reflex. Root tuberous; stem a foot high, round, upright, divided at top into a few one-flowered peduncles.—Native of dry hilly pastures in the south of Europe.

25. Ranunculus Pennsylvanicus; *Pennsylvanian Crowfoot.* Calices reflex; stem upright; leaves ternate, trifid, gashed, hairy underneath. It is an annual or biennial.—Native of Canada and Pennsylvania.

26. Ranunculus Ternatus; *Ternate-leaved Crowfoot.* All the leaves ternate; leaflets trifid; stem many-flowered; calices reflex.—Native of Japan.

27. Ranunculus Asiaticus; *Persian Crowfoot,* or *Garden Ranunculus.* Leaves ternate and biternate; leaflets trifid, gashed; stem hairy, branched. Root perennial, of numerous, brown, fleshy, tapering knobs; stem twelve or fifteen inches high, erect, round, downy, branched from the middle or lower part, bearing from three to five large long-stalked flowers. In a wild or single state the large and splendid petals are of a vivid crimson, occasionally varying to yellow. The flowers appear in May; and in moderate seasons, or where they are shaded from the sun in the heat of the day, there will be a succession at least during a month. Mr. Miller thinks this flower came originally from Persia. Since it has been in Europe, innumerable varieties have been obtained from seed, particularly of semi-double flowers: these are so large, and of so many beautiful colours, as to exceed most other flowers of their season, and even to vie with the Carnation itself. Many of them are finely scented, and the strong roots generally produce from twenty to thirty flowers in succession; hence it has been highly valued and admired.—*Culture.* All the very double flowers do not produce seeds, and are only multiplied by offsets from their roots, which they generally produce in great plenty, if planted in a good soil, and duly attended to in winter. The beds in which they should be planted, must be made with fresh, light, sandy earth, at least three feet deep. The best soil for them may be composed as follows: Take a quantity of fresh earth from a rich upland pasture, about six inches deep, together with the green sward; this should be laid in a heap for twelve months to rot before it is mixed, observing to break the clods in turning it very often to sweeten it: to this add a fourth part of very rotten cow-dung, and a proportionable quantity of sea or drift sand, according as the earth is lighter or stiffer; if it be light and inclined to a sand, there should be no sand added; but if it be a hazel loam, one load of sand will be sufficient for eight loads of earth; but if the earth be strong and heavy, the sand should be added in a greater proportion: this also should be mixed eight months or a year before it is used, and should be often turned over, in order to unite the parts well together before it is put into the beds. The depth which this soil should be laid in the beds, is three feet below the surface, according to the ground; for in dry ground two feet eight inches below the surface will be suffi-

RANUNCULUS.

Most of the Flowers here represented are such as the Florists term Semi-Double; and from the Seeds of such, all the most valuable Varieties are produced.

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cient, and in very moist soils only two feet, the remaining one foot being above the surface of the natural earth. In very moist ground, it will also be proper to lay some rubbish and stones in the bottom of each bed, to drain off the moisture; and if upon this, at the bottom of the beds, some very rotten cow-dung be laid two or three inches thick, the roots will reach this in the spring, and the flowers will be the fairer in consequence. The earth for the bed need not be screened very fine, for then the great winter rains would bind it in one solid lump, detaining the moisture and rotting the roots. The beds being thus prepared, should lie a fortnight to settle before the roots are planted, that there may be no danger of the earth settling unequally after they are planted; which would prejudice the roots, by leaving hollow places in some parts of the beds, in which the water would always lodge. In autumn, having levelled the earth, laying the surface a little rounding, the beds should be marked out in rows by a line, at about six inches' distance every way, so that the roots may be planted every way in straight lines: open the earth with your fingers at each cross, where the roots are to be planted, at about two inches deep, placing them exactly in the middle, with their crowns upright; then with the head of a rake draw the earth upon the surface of the bed level, so that the tops of the roots will be covered about two inches deep, that being sufficient. This work should be done in dry weather, because the earth will then work better than if it were wet; but the sooner after the planting there happens to be rain, the better it will be for the roots. If no rain should happen in a fortnight's time, it will be proper to water the beds, to prevent the roots from decaying. When the roots are thus planted, there will no more care be required until toward the end of November, by which time they will begin to heave the ground, and the buds of their leaves will appear; then lay a little of the fresh earth of which the beds are composed, about half an inch thick, over the beds, which will defend the crown of the root from frost; and when you perceive the buds to break through this second covering, if it should prove very hard frost, it will be proper to arch the beds over with hoops, and cover them with mats, but especially in the spring, when the buds will begin to appear; for if exposed to severe frost or blighting winds at that season, their flowers seldom open fairly, and many times their roots are destroyed. In the beginning of March, the flower-stems will begin to rise; then carefully weed the beds, and stir the earth with your fingers between the roots, taking care not to injure them. This will improve the appearance of the beds, and greatly strengthen the flowers in their blowing; and if the nights prove frosty, the beds should be covered with mats every evening, and shaded from the sun in the heat of the day.—When the flowers are past, and the leaves withered, take up the roots, and carefully clear them from the earth, then spread them upon a mat to dry in a shady place; after which they may be put up in bags or boxes in a dry room until the October following, which is the season for planting them again.—These Persian sorts are not only propagated by offsets from the old roots, but are also multiplied by seeds, which the semi-double kinds produce in plenty. Whoever wishes to have them in perfection, should sow the seeds annually, which will every year produce new varieties. All however depends upon the careful selection of the seeds. The flowers left to seed, ought at least to have five or six rows of petals, and to be well coloured; for as these flowers increase plentifully, it is not worth while to sow indifferent seeds, from which no good flowers can be obtained. Being prepared with seeds about the middle of August, which is the proper season for sowing them, provide some large pots, flat seed-pans, or boxes. These should be filled with light rich earth, levelling the surface very even; then sow the seeds thereon pretty thick, and cover it about a quarter of an inch thick with the same light earth; after which you should remove these pots, pans, or boxes, into a shady situation, where they may have the morning sun till ten o'clock. In dry seasons refresh them gently with water, taking care not to wash the seeds out of the ground. In this situation the pots should remain until the beginning of October, by which time the plants will begin to come up, though it is sometimes the end of November before they begin to appear; then remove them into a more open exposure, where they may have the full sun. Towards the middle of November, when you are apprehensive of frost, remove the pots under a common hot-bed frame, where they may be covered with glasses in the night-time, and also in bad weather; but in the day, when the weather is mild, they should be entirely opened, to prevent the plants from being drawn up too weak. The only dangers they are exposed to are violent rains and frosts; the rain often rotting the tender plants, and the frost turning them out of the ground. In the spring, as the season grows warm, these pots should be exposed to the open air, placing them at first near the shelter of a hedge, to protect them from the cold winds; but at the beginning of April they should be removed into a more shady situation, according to the warmth of the season. In the latter end of April, place them where they can only have the morning sun, and let them remain there till their leaves decay, when they may be taken out of the earth, and their roots dried in a shady place; after which they may be put up in bags, and preserved in a dry place till the October following, and then they must be treated as above directed for the old plants. When these roots flower in the following spring, carefully mark such of them as are worthy to be preserved. You should not suffer those flowers, which you intend to blow fine the succeeding year, to bear seeds; if they appear inclined to do so, cut off the flowers when they begin to decay, for those roots which have produced seeds seldom flower well till afterwards; nor will the principal old root, which has flowered strong one year, ever blow so fair as the offsets, which is what should be principally observed when a person purchases any of these roots, as the sellers generally palm off the old roots upon their customers, judiciously reserving the offsets for their own use.—In planting these roots, particularly observe to place the semi-double kinds, from which you intend to reserve seeds, in separate beds by themselves, and not intermix them with the double flowers, because they require different management. When the seed begins to ripen, which may be easily known by its separating from the axils and falling, look over the plants daily, gathering it as it ripens; for there will be a considerable difference in the seeds of the same bed coming to maturity, at least a fortnight, and sometimes three weeks or a month. The seed when gathered should not be exposed to the sun, but spread to dry in a shady place, and afterwards laid up out of the reach of vermin. This method of sowing seeds every year not only increases the stock of roots, but also raises new varieties, which may be greatly improved by changing the seeds into fresh ground. It will also be necessary to take away all the earth out of the beds in which the roots were blown, if you intend to plant these flowers there again; otherwise they will never thrive half so well, as all the curious florists continually observe. In case of severe weather after planting, it will be proper to cover the bed with straw or pease-haulm, to guard them against frost; but this covering should

always be removed in favourable weather. In spring, when the ground is loose, tread or beat it on a fine day, pressing it close to the plants with the fingers, to keep out the cold parching winds. Some long straw, placed between the rows, will protect the plants, and keep the ground moist: if the spring showers should fail, water must be applied gently between the rows. When the seed-leaves appear, the young plants will require more air, and must be regularly but gently watered, except when there are warm showers of rain. When the sun shines hot, the glasses must be raised to admit fresh air, and the frame also shaded with mats. To conclude: The varieties produced from the semi-double flowers are unbounded, and more numerous than any other flower; and the catalogue of a celebrated florist boasts nearly eight hundred. According to him, a fine Ranunculus should have a strong straight stem from eight to twelve inches high. The flower should be of a hemispherical form, at least two inches in diameter, consisting of numerous petals, gradually diminishing in size to the centre, lying over each other so as neither to be too close nor too much separated, but having more of a perpendicular than horizontal direction, in order to display the colour with better effect: the petals should be broad, with entire well-rounded edges: their colour should be dark or clear, rich or brilliant, either of one colour, or variously diversified on an ash, white, sulphur, or fire-coloured ground, or else regularly striped, spotted, or mottled in an elegant manner.

28. Ranunculus Rutæfolius; *Rue-leaved Crowfoot.* Leaves pinnate and ternate; leaflets three-parted, multifid; stem quite simple; corolla many-petalled; root tuberous. The stem is from two to five inches high, mostly simple and single-flowered, sometimes bearing two, rarely three flowers: these are of a brilliant white, at first tinged with red, on long stalks.—It flowers in June; and is a native of the mountains of Austria, Dauphiny, Switzerland, and Piedmont.

29. Ranunculus Glacialis; *Two-flowered Crowfoot.* Calices hirsute; stem two-flowered; leaves multifid. Root large and fleshy, in the form of a bulb, very acrid, and putting forth many long thick fibres.—It flowers in June; and is a native of Lapland, Denmark, Switzerland, Dauphiny, and Piedmont, on high granite mountains near the continual snows.

30. Ranunculus Nivalis; *Alpine Yellow Crowfoot.* Calix hirsute; stem one-flowered; root-leaves palmate; stem-leaves many-parted, sessile. Flowers solitary, on long, terminal, hairy stalks; petals yellow, obovate, twice the length of the calix.—Native of Lapland and Norway.

31. Ranunculus Alpestris; *Alpine White Crowfoot.* Root-leaves subcordate, blunt, three-parted; stem-leaf lanceolate, quite entire. Stem one or two flowered.—Native of Switzerland, Austria, Carniola, and Dauphiny.

32. Ranunculus Lapponicus; *Lapland Crowfoot.* Leaves three-parted, lobed, blunt; stem almost flaked, one-flowered; root fibrous; flower terminating, yellow.—Native of Lapland.

33. Ranunculus Monspeliacus; *Montpelier Crowfoot.* Leaves three-parted, crenate; stem simple, villose, almost naked, one-flowered. Flower of a brilliant golden yellow.—Native of the south of France, and of Barbary.

34. Ranunculus Bulbosus; *Bulbous Crowfoot*, or *Butter-cups.* Calices bent back; peduncles grooved; stem upright, many-flowered; leaves compound; root a solid white roundish bulb, flatted a little both at top and bottom, somewhat resembling a small turnip. It is distinguished from the thirty-first species, with which some others have confounded it, by its roots, by its never throwing out runners, and by its reflexed calix: this last character arises from its particular structure, the lower half being thin and almost transparent, and not having sufficient solidity to support itself upright. It is the second flower which, next to the Dandelion, covers the meadows with dazzling yellow. Like most of the Crowfoots, it possesses the property of inflaming and blistering the skin; particularly the roots, which are said to raise blisters with less pain and greater safety than Spanish flies, and have been applied for that purpose, especially to the joints, in the gout. The juice is even more acrid than that of the sixteenth species, and, if applied to the nostrils, provokes sneezing. The roots, on being kept, lose their stimulating quality, and are even eatable when boiled. Boys often dig them up, and devour them. The herb is too acrid to be eaten alone by cattle; accordingly the flowering-stalks are left to perfect the seeds in pastures, though some of it certainly is consumed; and it appears probable that this and other pungent plants mixed with the Grasses, may act with a powerful stimulus to some animals, as salt does to others. It abounds in dry pastures, and flowers in May. Besides the name of Round-rooted or Bulbous Crowfoot, it is called, by the common people, Butter-flower, Butter-cups, King-cups, Gold-cups; and it is the "cuckow-buds of yellow hue," in Shakspeare.—This species, and the two following, are all confounded by the vulgar under one name.

35. Ranunculus Hirsutus; *Pale Hairy Crowfoot.* Calices bent back, acuminate; stem upright, many-flowered, hirsute; leaves ternate; root fibrous, annual. The flowers and seeds are smaller than in the preceding species. Petals yellow above, paler and opaque beneath.—Mr. Curtis observed this species in various places near London; as, by the road-side between Crydon and Mitcham, near Gravesend, and plentifully by the sea-side; also on the gravelly banks about Southampton. It has also been seen upon new-made banks in the salt-marshes near Yarmouth; on South Leigh common, in Oxfordshire; and abundantly in the pastures of Bedfordshire.

36. Ranunculus Repens; *Creeping Crowfoot.* Calices spreading a little; peduncles grooved; runners creeping; leaves compound; root perennial, consisting of numerous white fibres; flowering-stem erect, generally supporting two flowers. The whole herb is rough and hairy, of a dark green; and the petals deep yellow.—This species is sufficiently distinct from the other common Crowfoots, in its creeping stems, and sending forth more roots at every joint: which render it more mischievous than those, as also because it will thrive in almost any soil, and is very sure to become the principal plant of the pasturage, to the great detriment of the farmer. From the great variety of soil and situation in which this species is found, it assumes many varieties. By a river's side, or in marshes, it will grow three or four feet high, with a stem nearly as large as a man's thumb; in barren gravelly fields it is entirely procumbent, with a stem not larger than a small wheat straw; but in all states it retains the character of the creeping stem, and does not lose it in cultivation. Its principal time of flowering is in June, but it may be found in blossom during most of the ensuing summer months, in meadows and pastures, under hedges, in shady waste places, church-yards, and gardens. The qualities of this and the twenty-ninth species are nearly alike, both blister the skin, and are very acrid to the taste. It is sometimes found double, though not very often.

37. Ranunculus Polyanthemos; *Many-flowered Crowfoot.* Calices spreading a little; peduncles grooved; stem upright; leaves many-parted. Flowers large, yellow, drooping. This species has no sensible acrimony.—Native of Germany, Switzerland, Sweden, Dauphiny, and Piedmont, in woods; flowering in May and June. It is perennial.

38. Ranunculus Acris; *Upright Meadow Crowfoot.* Calices spreading a little, peduncles round; leaves three parted, multifid, the uppermost linear. Root perennial, tuberous, with many long, simple, white fibres. Petals bright shining yellow.—Native of meadows and pastures in all the northern parts of Europe, and very common in England, flowering in July. The scale of the nectary at once distinguishes this species from the fourteenth; the spreading calix from the twenty-ninth and thirtieth; and the round even flower-stalks, from both those and the thirty-first species; whilst the smooth seeds prevent our mistaking it for any species which has them rough or muricated. It is indeed known at first sight from all our other wild species, by its tall, thin, genteel, upright growth, from which it has received its English name. Most of the Crowfoots are known to be acrid, and some are thought to be poisonous, but this plant received its trivial name from its supposed superior degree of acridity. All its parts are exceedingly acrid: the juice of the leaves takes away warts; and bruised together with the roots, they will act as a caustic, by inflaming and corroding the parts to which they are applied. In violent headaches, where the pain is confined to one part, a plaster made of them frequently affords almost immediate relief; and they have been used in the gout with great success. Mr. Curtis declares, that even pulling it up and carrying it to some little distance has produced a considerable inflammation in the palm of the hand; that cattle in general will not eat it, yet that sometimes, when they are turned hungry into a new field of grass, or have but a small spot to range in, they feed on it, and their mouths have become sore and blistered. According to Linneus, sheep and goats eat it, but cattle, horses, and even hogs, refuse it. When made into hay, it loses its acrid quality, but then seems to be too hard and stalky to yield much nourishment: if it be of any use, it must be to correct by its warmth the insipidity of the Grasses. In many pastures the flowering-stems are left standing in abundance, to disseminate their seeds: before they could do that, they might easily be cut down with the scythe, or be pulled up by women and children after a shower, which would more effectually destroy the plants; they should be gathered into heaps, and burnt. It flowers in June and July, and is confounded with the twenty-ninth and thirty-first species, under the name of Butter-flower or Butter-cups, under a notion that the yellow colour of butter is owing to these plants. It is the richness and exuberance of the pasture that communicates this colour to the butter, and not these flowers, which the cattle seldom or ever touch.

39. Ranunculus Lanuginosus; *Broad-leaved Crowfoot.* Calices spreading a little; peduncles round; stem and petioles hirsute; leaves five-cleft, lobed, crenate, velvety. Flowers yellow, much like those of the preceding species. This is easily known by its stature, hairiness, and place of growth in woods and shade.—Native of Denmark, Germany, Switzerland, Austria, the south of France, and Piedmont.

40. Ranunculus Chœrophyllos; *Fine-leaved Crowfoot.* Calices turned back; peduncles grooved; stem upright, one-flowered; leaves linear, multifid; root perennial; flower yellow; plant acrid.—Native of France and Italy. It is not often observed in England, probably owing to its humble growth, the smallness of its flowers, and its want of elegance in form or colour. It occurs, however, in several places about London; as, near Camberwell, about Lee Bridge, and near Walthamstow. Found also on Green-street green, near Dartford in Kent; near Worcester, and on Malvern-hill near Norwich; near Madingley, Trumpington, Shelford, Toft, and Gamlingay, in Cambridgeshire; on Bullington green, Shotover hill, and South-Leigh, in Oxfordshire; on St. Vincent's rocks near Bristol; near Lymington and Lulworth cove in Dorsetshire, where some of the fallow lands in the neighbourhood of Blandford are overrun with it.

41. Ranunculus Millefoliatus. Leaves superdecompound, linear; calices hairy; stem branched, silky, villose. It is allied to the preceding species; root tuberous, oblong, in bundles, narrowing downwards, and ending in a fibre. It flowers in winter.—Native of Greece, Syria, Barbary, &c.

42. Ranunculus Parvulus; *Little Upright Crowfoot.* Seeds tubercled; leaves hirsute, three-lobed, gashed; stem upright, few-flowered; root small, annual, with long simple fibres. It flowers in July and August.—Native of the south of France, Italy, and Russia. Found also in abundance near Bristol hot-wells.

43. Ranunculus Arvensis; *Corn Crowfoot.* Seeds prickly; leaves trifid, decompound; segments linear; root annual, composed of simple fibres; stem upright, a foot or more in height; flowers small, lemon-coloured. Every part of the plant has a pale appearance, and is easily distinguished from our wild Crowfoots by this circumstance, by its large prickly seeds, its annual root, and its place of growth, which is in corn-fields, where it is very common among crops of all kinds, in most parts of Europe, but more abundantly in some soils than in others; flowering in May and June, and ripening its seeds before harvest, so that it fills the ground, but, not being a very luxuriant plant, is not a very formidable weed. In some counties it is called *Hunger-weed,* probably from its indicating a sterile soil. It is said to be as highly acrimonious when fresh, as any of the other species. Mr. Brugnon relates its poisonous effects on sheep, who nevertheless eat it greedily, as also do cattle and horses. It occasions colic, gangrene of the stomach, and death in a few hours. Three ounces of the juice killed a dog in four minutes. The above author thinks vinegar the best antidote. Happily for England, this plant generally grows where it is not accessible to cattle; which probably is the reason why we have not heard of any mischief done by it in this country; but the husbandman would do well to guard against it in fallow-fields, and pastures in the neighbourhood of corn land.

44. Ranunculus Muricatus. Seeds prickly; leaves simple, lobed, blunt, smooth; stem diffused; root-leaves three-lobed, smooth, toothed; teeth blunt, unequal.—Native of ditches and marshes in the south of Europe and in Barbary.

45. Ranunculus Parviflorus; *Small-flowered Crowfoot.* Seeds prickly; prickles hooked; leaves simple, laciniated, acute, hirsute; stem diffused; root annual, fibrous; petals pale yellow. It flowers in May and June, and the seeds ripen in June and July.—Native of the more temperate parts of Europe; and in England, on banks, and in waste as well as cultivated ground where the soil is gravelly.

46. Ranunculus Orientalis; *Oriental Crowfoot.* Leaves spiny, subulate, recurved; calices reflex; leaves multifid. Flowers large, pale yellow.—Native of the Levant.

47. Ranunculus Grandiflorus; *Great-flowered Crowfoot.* Stem upright, two-leaved; leaves multifid; stem-leaves alternate, sessile.—Native of the Levant.

48. Ranunculus Falcatus; *Sickle-seeded Crowfoot.* Leaves wedge-form, three-parted; segments multifid, filiform; seeds sickle-shaped; scape naked, one-flowered. Root annual; stalks simple, downy, each bearing a small yellow flower.—Native of Austria, in corn-fields, and of other parts in the south of Europe and the Levant; flowering early in spring, and soon passing away.

49. Ranunculus Hederaceus; *Ivy-leaved Crowfoot.* Leaves roundish, kidney-shaped, three or five lobed, entire, even:

stem creeping. Roots perennial, fibrous, numerous, simple, whitish, penetrating deeply into the mud. Stems either creeping or floating, prostrate, branched, round, and succulent; flowers very small; petals white, with yellow claws. The leaves sometimes have a dark spot in the middle of each, and in some situations the flowers are much larger than in others. It flowers from May to August, and is found in slow shallow rivulets, especially where the soil is sandy, in watery places, and shallow muddy ditches.—Native of many parts of Europe, as Denmark, Germany, France, and even of Siberia and Barbary.

50. Ranunculus Aquatilis; *Water Crowfoot.* Submerged leaves capillaceous; emerged leaves subpeltate; stamens numerous; seeds corrugated. Root perennial, fibrous, throwing up long round stems, clothed with alternate leaves, having broad membranaceous stipules at the base of their foot-stalks. The flowers are sometimes very large, and make a handsome show in ponds and ditches. The curious variety in the floating and immersed leaves, adds to the beauty of this common aquatic plant. The other varieties grow floating in the water, and have all the leaves capillary. In one, they form a roundish line; in another, the segments of the leaves are very long, parallel, and take the direction of the current. These varieties are clearly occasioned by the depth and velocity of the stream. Dr. Pulteney has recorded a curious fact, which contradicts the assertions of the deleterious qualities of this plant, and proves that it is not merely innoxious, but nutritive to cattle, and capable of being converted to useful purposes in agricultural economy. In the neighbourhood of Ringwood, on the borders of the Avon, some of the cottagers support their cows, and even horses, almost wholly by this plant. A man collects a quantity every morning, and brings it in a boat to the edge of the water, from which the cows eat it with great avidity; insomuch that they stint them, and allow only about twenty-five or thirty pounds to each cow daily. One man kept five cows and one horse so much on this plant, with the little that the heath afforded, that they had not consumed more than half a ton of hay throughout the whole year; none being used, except when the river was frozen over. Hogs are also fed with this plant, and improve so well on it, that it is not necessary to give them any other sustenance till they are put up to fatten. This property of Water Crowfoot is the more remarkable, because all the species are deemed acrimonious, and some undoubtedly are so in a high degree. It is probable that this species is rendered inert, and even wholesome, by growing in the water; although it must be confessed, that in other instances moisture heightens the deleterious properties of vegetables, especially in the umbelliferous tribe. Before the introduction of Cantharides, several of the Crowfoots were used as vesiccatories, and are said to act with less pain, and without any effect on the urinary passages; but their action is supposed to be uncertain, and they are accused of frequently leaving ill-conditioned ulcers.

51. Ranunculus Ophioglossoides. Stem simple, upright; leaves nerved, lower leaves ovate, subcordate, petioled; floral-leaves sessile, lanceolate.—Native of the mountains of Dauphiny.

52. Ranunculus Frigidus. Root-leaves wedge-form, ovate, five-toothed at the tip; stem-leaves sessile, palmate.—Native of the mountains of Siberia.

53. Ranunculus Trilobus. Stem upright; leaves smooth; stem-leaves three-lobed; peduncles striated; seeds compressed, tubercled. Flowers very small, yellow.—Found in moist fields near Mayane, in the north of Africa.

54. Ranunculus Spicatus. Leaves oblong, toothed; stem simple; seeds in spikes; roots consisting of numerous oblong bulbs in bundles.—Native of the marshes in the neighbourhood of Algiers.

55. Ranunculus Flabellatus. Leaves simple, toothed, and ternate; leaflets laciniate; stem simple.—Found in the neighbourhood of Algiers.

56. Ranunculus Japonica. Leaves gash-terminate; lobes gashed-toothed, hirsute; stem hirsute.—Native of Japan.

57. Ranunculus Seguieri. Leaves three-parted; lobes multifid, laciniate, acute, all petioled; stem many-flowered; calices smooth.—Native of the mountains of Italy, Dauphiny, and Carniola.

58. Ranunculus Montanus. Leaves five-lobed, toothed; stem-leaf sessile, digitate; segments linear, lanceolate, quite entire; stem one-flowered.—Native of the mountains of Switzerland, Dauphiny, and Austria.

59. Ranunculus Gouani. Leaves five-lobed, toothed; stem-leaf sessile, palmate; segments lanceolate, toothed; stem one-flowered.—Native of the Pyrenees and Hungary.

60. Ranunculus Hyperboreus. Leaves deeply three-lobed: lobes oblong, divaricate; stem filiform, creeping.—Native of Iceland, Norway, and Siberia, in watery places.

61. Ranunculus Polyrhizos, Root-leaves palmate; stem-leaves sessile, digitate; stem many-flowered; roots in bundles.—Native of Siberia.

62. Ranunculus Cappadocicus. Calices patulous; peduncle round; stem subbifid; leaves cordate, three-lobed, toothed.—Native of Cappadocia.

63. Ranunculus Oxyspermus. Root-leaves oblong, blunt, sinnate-toothed; stem-leaves sessile, digitate, gashed; seeds awned.—Native of Siberia.

64. Ranunculus Polyphyllus. Submerged leaves oblong, petioled, capillaceous; floating leaves wedge-shaped, three-lobed; emerged leaves elliptic; stem upright; flowers very small and yellow.—Native of Hungary.

65. Ranunculus Nitidus. Plant very glabrous; stems fistulose; radical leaves rotundate-subreniform, obtusely crenate; stem-leaves sessile, digitate; folioles cut; segments obtuse; seeds subglobose, very smooth; flowers small; petals white.—Grows in inundated grounds from New York to Canada. This is evidently closely allied to *Ranunculus Abortivus;* and Pursh suspects that they are only varieties.

66. Ranunculus Pygmæus. Plant small, glabrous; radical leaves subcordate-reniform, inciso-dentate; stem-leaves sessile, digitate; segments linear, very entire; stem with few flowers; petals oblong, nearly equal to the calix, yellow.—Native of Lapland and Labradore.

67. Ranunculus Tomentosus. Plant very villose, low; stem creeping, one and two flowered; leaves tomentose, trilobate; calix hispid, subreflex; flowers yellowish white.—Grows in Carolina.

68. Ranunculus Marylandicus. Plant pubescent; stem simple, nearly naked; radical leaves ternate; little leaves trilobate; lobes acute, cut; calix reflex; flowers two or three, terminal, on short, scarcely downy stalks, pale yellow.—Grows in shady woods from Pennsylvania to Virginia, and flowers from June to August.

69. Ranunculus Recurvatus. Plant pubescent; leaves trilobous; lobes cuneiform at the base, cut and acute at the tip; stem multiflorous; corolla and capsules recurved; petals linear, almost white.—Grows in shady woods from New York to Carolina, and flowers from June to August.

70. Ranunculus Septentrionalis. Plant slightly glabrous; leaves membranaceous, glabrous, ternate; little leaves subtrilobate, cut, acute; stem and petioles rough at the base; peduncles subbiflorous; calices reflex; flowers pale yellow.—Grows in North America.

71. Ranunculus Hispidus. Plant very rough, erect; leaves ternate; folioles acutely lobate; stems beneath the first peduncle naked, with few flowers; flowers small, pale yellow. —Grows in wet fields, and on the banks of ditches, in Virginia and Carolina; and flowers from June to August.

72. Ranunculus Fluviatilis. All the leaves dichotomous-capillaceous; stem floating; flowers white.—Found in tranquil rivers, from Pennsylvania to Carolina.

Rape. See *Brassica.*

Raphanus; a genus of the class Tetradynamia, order Siliquosa.—Generic Character. *Calix:* perianth four-leaved, erect; leaflets oblong, parallel, converging, deciduous, gibbose at the base. *Corolla:* four-petalled, cruciform; petals obcordate, spreading; claws a little longer than the calix; nectariferous glands four, one on each side between the short stamen and pistil, and one on each side between the longer stamina and the calix. *Stamina:* filamenta six, awl-shaped, erect: of these, two that are opposite are of the same length with the calix; and the remaining four are the length of the claws of the corolla; antheræ simple. *Pistil:* germen oblong, ventricose, attenuated, the length of the stamina; style scarcely any; stigma capitate, entire. *Pericarp:* silique oblong, with a point, ventricose, with little swellings, subarticulate, cylindrical. *Seeds:* roundish, smooth. Essential Character. *Calix:* closed. *Silique:* torose, subarticulate, cylindrical. *Nectariferous Glands:* four, two between each shorter stamen and the pistil, and two between the longer stamina and the calix.——The species are,

1. Raphanus Sativus; *Common Garden Radish.* Siliques cylindrical, torose, two-celled; leaves lyrate. Root annual, large, fleshy, fusiform or subglobular, white within; red, white, or black on the outside.—Native of China, Cochinchina, and Japan; in all of which countries it is much cultivated. Mr. Miller aims at making four sorts of this esculent root, which he says he never found to vary in the course of forty years' experience; and that by sowing the seeds of each carefully, without mixture, the produce will always prove the same as the plant which the seeds were saved from. 1. The first, or Long-rooted Radish, is the sort commonly cultivated in kitchen-gardens for its roots. Of this there are several subordinate variations; as the Small-topped, the Deep-red, the Pale-red or Salmon, and the Long-topped Striped Radish: which slight differences Mr. Miller allows to have arisen from cultivation. The Small-topped is most commonly preferred by the gardeners near the metropolis, because they require much less room than those with large tops; for as forward Radishes are what produce the greatest profit to the gardener, and these are commonly sown upon borders near hedges, walls, or pales, the Large-topped Radish would be apt to grow mostly at top, and not swell so much in the root as the other, especially if the plants should be left pretty close. 2. The second, or Small Round-rooted Radish, is not very common in England, but in many parts of Italy it is the only one cultivated: the roots are very white, round, small, and very sweet. It has of late years been brought to the London markets in the spring, generally in bunches, and is sometimes mistaken for young Turnips. If eaten young, it is crisp, mild, and pleasant. 3. The third sort, or Large Turnip-rooted, or White Spanish Radish, has a moderately large, spheroidal white root, and is esteemed chiefly for eating in autumn, and the early part of winter. This and the second sort are confounded together, under the name of Turnip Radishes. 4. The fourth sort, or Black Turnip-rooted Spanish Radish, has a root like the preceding, white within, but a black skin, and is greatly esteemed by many for autumn and winter eating. Mr. Miller observes, that the third and fourth varieties are generally cultivated for medicinal use, but that some persons are very fond of them for the table.—*Propagation and Culture.* The season for sowing the seeds of the Common Radish are various, according to the time when they are designed to be used. The earliest season is at the end of October or the beginning of November, for then the gardeners near London sow them to supply the market at the beginning of March. They are commonly sown on warm borders, near walls and pales, or hedges, where they may be defended from the cold winds. There are, however, some persons who sow Radish seeds among other crops at the middle of September, which, if not destroyed by frost, are fit for use early in February: but this is sooner than most people care to eat these roots; and this crop, if not used while young, soon grows strong and sticky. The second general sowing is usually about Christmas, provided the season be mild, and the ground in a fit condition to work. These are also sown in sheltered places, but not so near pales and hedges as the October sowing. Unless destroyed by frost, they will be fit for use at the beginning of April; but in order to have a succession of these roots for the table through the season, you should repeat sowing the seeds once a fortnight, from the middle of January till the beginning of April, always observing to sow the latter crops upon a moist soil and in an open situation, otherwise they will run up, and grow sticky, before they are fit for use. Many of the gardeners near London sow Carrot-seed with their early Radish, so that when their Radishes are killed, which sometimes happens, the Carrots will remain; for the seeds of Carrots commonly lie in the ground five or six weeks before they come up, and the Radishes seldom lie above a fortnight under ground at that season, so that they are often up and killed, when the Carrot-seeds remain safe in the ground; but when both crops succeed, the Radishes must be drawn off very young, or the Carrots will be drawn up so weak as not to be able to support themselves when the Radishes are gone. It is also a constant practice with the kitchen-gardeners, to mix Spinach-seed with their latter crops of Radishes. When these are drawn off, and the ground cleaned, the Spinach will thrive greatly, and in a fortnight's time will as completely cover the ground as though there had been no other crop. If it be of the broad-leaved kind, the Spinach will be larger and fairer than it commonly is when sown by itself; because, where there is no other crop, the Spinach-seed is commonly sown too thick, and the plants are therefore drawn up weak: but in this management, the roots standing pretty far apart, have room to spread; and if the soil be good, the plants will attain a considerable size before they run up to seed. When the Radishes are come up, and have five or six leaves, pull them up where they are too close, otherwise they will run to top, and the roots will not increase in bulk. In doing this, some only draw them out by hand; but the best method is to thin them with a small hoe, which will stir the ground, destroy the weeds, and promote the growth of the plants. For drawing small, leave them at three inches' distance; but at six inches, if they are to stand longer.—For saving Radish-seed: At the beginning of May, prepare a spot of ground, proportionable to the quantity of seed intended to be saved. Dig it well, and level it; then draw up some of the straightest and best-coloured Radishes, and plant them in rows three feet distant, and two feet asunder in the rows; observing, if the season be dry, to water them until they have taken root; after which they will only require to have the weeds hoed down between them, until they have advanced so high as to overspread the ground. When the seed begins to ripen, guard it carefully against birds. When it is ripe, the pods will

change brown; it must then be cut, and spread in the sun to dry, then threshed, and afterward laid by for use.—The Turnip Radish must not be sown till the beginning of March, and the plants must be allowed a greater distance than the common spindle-rooted sort. Its seeds are liable to degenerate, unless when sown near the latter. The White and Black Spanish Radishes are commonly sown about the middle of July, or a little earlier, and are fit for the table by the end of August, or the beginning of September; they will continue good till frost spoils them. They require thinning to a greater distance than the common sort, for their roots grow as large as Turnips, and should not remain nearer than six inches. To have these roots in winter, draw them before the hard frost comes on, and lay them in dry sand, as is directed for Carrots, carefully guarding them from wet and frost; and they will keep good till spring.—The ground where any sorts of Radishes are to be sown, ought to be well trenched, the clods broken, and the ground levelled at sowing down, that the roots may have full scope to descend. Cos or other Lettuce may be sown with the spring crop of Radishes, along with Carrots. Sow the seeds all together broadcast pretty thick, in the early sowings; raking them in well with a large rake. The London gardeners cover the early crops with straw, suffering it to remain till the plants are fairly come up, and then raking it off lightly every mild day, but putting it on every night, at least where there is any appearance of frost. Dry Fern will answer the same purpose; and it is better still to throw mats, supported on wooden pegs, or on hoops, over the bed at night and on severe days. If very dry weather should happen in March or April, the crop must be watered morning and evening.—Radishes are sown very thick, like Cresses and Mustard, to cut in the seed-leaf for salads, both in the natural ground and on hot-beds. From Christmas to Candlemas, Radishes are raised on hot-beds for the root. Eighteen inches' depth of dung is sufficient to bring them up; and six or seven inches' depth of light rich mould. Sow the seeds moderately thick; cover it half an inch thick; put on the lights: the plants will come up in a week, or less; and when they appear, the lights should be either lifted, or occasionally taken off, according to the weather. In a fortnight afterwards, thin them to the distance of an inch and half or two inches, and in six weeks they will be fit to draw. If there be no frames to spare, the beds may be covered with mats over hoops, and the sides secured by boards or straw-bands. Or, in want of dung, if the beds be covered with frames, and the lights be put on at night and in rough weather, they may be raised a fortnight sooner than in the open borders.

2. Raphanus Caudatus; *Long-tailed Radish.* Siliques decumbent, longer than the whole plant. This has the appearance of the Common Radish, but the leaves are sharper, and the stem shorter. Annual. The appearance of this plant, weighed down to the ground by its immoderately long serpentine pods, is altogether extraordinary. The pods are pickled in Java, and known by the name of *mougri.*—Native of Java.

3. Raphanus Raphanistrum; *Wild Radish*, or *Jointed-podded Charlock.* Pods jointed, even, one-celled. This abounds in many places among spring corn, flowering from June to August; sometimes mixed with Charlock, from which it is not vulgularly distinguished, but not frequently abounding where the other does not occur, or is only in small quantity. Linneus says, that in wet seasons this weed abounds among Barley in Sweden, and that being ground with the corn, the common people who eat barley bread, are afflicted with violent convulsive complaints, or an epidemic spasmodic disease. This, however, has never yet been known to occur in England; and Krocker says, he has proved the plants to be harmless by his own experiments, and even recommends it as a nutritious food for domestic quadrupeds, and as very agreeable to bees. The variety called the Sea Wild Radish has a thick white root like that of the Garden Radish, and has been found on the sea-shore in various parts of Britain, flowering in May. The root is large and succulent, lasting two or three years; and has been esteemed by some as an esculent root, preferable to Horse-radish. Cattle are very fond of the leaves.

4. Raphanus Sibiricus; *Siberian Radish.* Pods cylindrical, torulose-villose; leaves linear, pinnatifid.—Native of Siberia.

5. Raphanus Erucoides. Pods ovate, gibbous, with the beak the length of the pod; root biennial, simple, scarcely thicker than the stem, which is a foot and half high.—Native of Italy.

6. Raphanus Tenellus; *Small Radish.* Pods awl-shaped, jointed, two-celled, smooth, lanceolate, toothed, the lowest pinnatifid.—This plant flowers here in June and July; is an annual plant, and a native of Siberia.

Raspberry. See *Rubus.*

Rattan. See *Calamus.*

Rattle, Red. See *Pedicularis.*

Rattle, Yellow. See *Rhinanthus.*

Rattlesnake Root. See *Polygala Senega.*

Rauwolfia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-toothed, very small, permanent. *Corolla:* one-petalled, salver-shaped; tube cylindrical, globular at the base; border five-parted, flat; segments roundish, emarginate. *Stamina:* filamenta five, shorter than the tube; antheræ erect, simple, acute. *Pistil:* germen roundish; style very short; stigma capitate. *Pericarp:* drupe subglobular, one-celled, with a groove on one side. *Seed:* nuts two, convex at the base, attenuated at the top, compressed, two-celled. Essential Character. *Corolla:* oblique, salver-shaped. *Berry:* globose, succulent, two-seeded.——The species are,

1. Rauwolfia Nitida; *Shining Rauwolfia.* Leaves in fours, lanceolate, acuminate, very smooth, shining; flowers terminating, cymose. This is a small tree or shrub, shining all over very much, upright, full of a white glutinous milk, twelve feet high. The fruits are at first yellowish, but at length become very dark purple, are milky, and three times as large as a pea.—Native of South America, of St. Domingo, and other islands of the West Indies. It flowers here from June to September.—This, and the following, may be propagated by the seeds or berries sown in autumn, soon after they are ripe, in pots filled with fresh earth, and plunged into a hot-bed of tanner's bark. When the plants appear, they require frequent refreshings with water in small quantities. They should also have a large share of fresh air admitted in warm weather; and, when two inches high, ought to be transplanted each into a separate small pot filled with light earth, and have the management of other exotic stove plants. They may also be propagated by layers and cuttings, which should be laid to dry awhile before they are planted, and may then be plunged into a moderate hot-bed of tanner's bark, in the spring or summer, observing to shade them until they have taken root, after which time they may be treated as the seedling plants.

2. Rauwolfia Canescens; *Hoary Rauwolfia.* Leaves in fours, elliptic-obovate, acute, downy; flowers axillary or terminal; segments of the corolla obtuse. This species varies greatly in all its parts, according to the soil in which it is planted, the stem being from one to eighty feet in

height. Corolla green, with a tinge of red.—Native of dry sunny bushy places in the West Indies and neighbouring continent.

3. Rauwolfia Glabra; *Smooth Rauwolfia.* Leaves alternate, ovate-lanceolate, smooth; cymes opposite to the leaves, of few flowers: these are small and white. The whole plant is smooth; the stem shrubby, three feet high, with pliant, round, leafy branches; leaves scattered, single-ribbed, two or three inches long, on shortish footstalks.—Native of New Spain.

Reaumaria; a genus of the class Polyandria, order Pentagynia.—Generic Character. *Calix:* perianth five-leaved, squarrose; leaflets awl-shaped, acuminate, permanent, the smaller ones imbricate. *Corolla:* petals five, oblong, equal, sessile, scarcely larger than the calix, curved back at the tip; nectaries five, at the joinings of the petals, growing from a semi-lanceolate fold to the lower side of the petals, opposite to the other ciliate margin. *Stamina:* filamenta numerous, capillary, the length of the calix; antheræ roundish. *Pistil:* germen roundish; styles five, filiform, straight, approximating, the length of the stamina; stigmas simple. *Pericarp:* capsule ovate, five-celled, five-valved. *Seeds:* numerous, oblong, woolly on every side, the wool erect. *Observe.* The nectaries are singular, nearly as in *Hydrophyllum*, but at the sides of the petals. Essential Character. *Calix:* six-leaved. *Petals:* five. *Capsule:* one-celled, five-valved, many-seeded.——The species are,

1. Reaumaria Vermiculata. Leaves scattered, linear, fleshy, convex underneath, acute, sessile, spreading, with dewy dots scattered over them; corolla white. Annual. The habit of this plant is like a Tamarix or Salsola.—Native of the coasts of Egypt, Syria, and Sicily.

2. Reaumaria Hypericoides. Leaves elliptic-lanceolate, flat; calix minutely crenate. It is a hardy perennial, with an herbaceous stem, about a foot high. Flowers terminal, solitary, pale rose-coloured, with oblique petals.—Found in barren grounds near the desert of Syria.

Reed, and *Reed Grass.* See *Arundo.*

Reed, Indian Flowering. See *Canna.*

Reed Mace. See *Typha.*

Relhania; a genus of the class Syngenesia, order Polygamia-Superflua.—Generic Character. *Calix:* common imbricate, oblong; scales oblong, scariose. *Corolla:* compound rayed; corollets hermaphrodite, numerous, tubular in the disk; females ligulate in the ray; proper of the hermaphrodites funnel-form, with a five-cleft border; of the females ovate, oblong. *Stamina:* in the hermaphrodites; filamenta five, very short; anthera tubular. *Pistil:* in the hermaphrodites; germen oblong; style simple; stigmas two, reflexed; in the females; germen oblong, curved in a little; style simple; stigmas two, curved back. *Pericarp:* none; calix unchanged. *Seeds:* solitary, angular, crowned with a membranaceous calicle, which is many-cleft and jagged, both in the hermaphrodites and females. *Receptacle:* chaffy. *Observe.* This genus differs from *Athanasia* in having a ray; from *Leysera*, in not having a feathered pappus; and from *Osmites*, in the ray producing perfect seeds. Essential Character. *Calix:* imbricate, scariose. *Corollets:* of the ray very many. *Seed-crown:* membranaceous, cylindrical, short. *Receptacle:* chaffy.—For the propagation and culture of this genus, see *Athanasia.*—These plants are all natives of the Cape.——The species are,

1. Relhania Squarrosa; *Cross-leaved Relhania.* Leaves oblong, acuminate, nerveless, recurved at the tip. The whole shrub is smooth, and much branched, flowering in the green-house in May and June.

2. Relhania Genistifolia; *Heath-leaved Relhania.* Leaves lanceolate, acuminate, one-nerved, subimbricate. A bushy shrub, very much branched.

3. Relhania Microphylla; *Linear-leaved Relhania.* Leaves linear, nerveless, crowded very much together; flowers pedicelled.

4. Relhania Passerinoides; *Passerina-like Relhania.* Leaves linear, nerveless; flowers subsessile. The stems are upright, and not diffused.

5. Relhania Viscosa; *Clammy-leaved Relhania.* Leaves linear, three-sided, somewhat fleshy, viscid. When bruised, the dried leaves have an aromatic smell like orange peel.

6. Relhania Laxa; *Loose-flowered Relhania.* Leaves linear, villose, remote; flowers on very long peduncles; stem erect. It is annual.

7. Relhania Pedunculata; *Long-peduncled Relhania.* Leaves linear, villose; flowers peduncled; stem diffused. A small herbaceous annual species, whose root is furnished with numerous capillary fibres. Flowers small, yellow, on long axillary stalks about the summits of the branches.

8. Relhania Laterifolia; *Side-flowering Relhania.* Leaves linear, villose; peduncle lateral, shorter than the leaf.

9. Relhania Cuneata; *Wedge-leaved Relhania.* Leaves obovate, smooth; flowers sessile.

10. Relhania Virgata; *Twiggy Relhania.* Leaves linear, smooth, with a recurved point, shorter than the leaf; flowers sessile. Nearly allied to the preceding.

11. Relhania Paleacea; *Chaffy Relhania.* Leaves linear, three-sided underneath, becoming hoary, as do also the tender shoots; calices turbinate; flowers terminal, solitary, sessile. The stem is shrubby, a span high, branched; the leaves numerous, about an inch long.

12. Relhania Santolinoides; *Santolina-like Relhania.* Leaves linear, three-sided, hoary underneath, as are also the tender shoots; calices globular, subpetioled.

13. Relhania Pungens; *Prickly Relhania.* Leaves linear, somewhat prickly, striated underneath; flowers sessile. This and the two following species have the calix wider than in the rest, with the inner scales larger.

14. Relhania Decussata; *Cross-leaved Relhania.* Leaves three-sided, linear, acute, decussated; flowers sessile.

15. Relhania Calicina; *Large-cupped Relhania.* Leaves linear, lanceolate, three-nerved, acute; flowers sessile.

16. Relhania Bellidiastrum; *Flax-leaved Relhania.* Leaves linear, tomentose; flowers sessile.

Renealmia; a genus of the class Monadelphia, order Triandria.—Essential Character. *Calix:* none. *Petals:* six, regular, three inner ones largest, contracted at the base. *Style:* one. *Stigmas:* three, thread-shaped, involute, acute. *Capsule:* inferior, obovate, of three cells. *Seeds:* angular.—These plants are herbaceous, smooth, and inhabitants of woods; the roots fibrous, sometimes tuberous; leaves grassy, lax, ribbed; stem roundish, sometimes divided; flowers in alternate umbellate bunches, with short permanent sheaths; corolla white, spreading, soon falling off; capsule membranous; and the seeds in two rows, black.——The species are,

1. Renealmia Paniculata. Leaves ribbed, roughish at the edge; outer petals linear-lanceolate; inner scarcely twice as large, obovate-oblong; filaments united half way up.—Found near Port Jackson by Mr. Browne.

2. Renealmia Grandiflora. Stem panicled; leaves ribbed, roughish at the edge; inner petals four times as large as the outer; filaments united half way up.—Gathered by Sir Joshua Banks in New Zealand.

3. Renealmia Pulchella. Stem nearly simple; leaves with smooth edges; outer petals oval-oblong, inner obovate, with short claws; filaments distinct.—Found near Port Jackson.

Reseda; a genus of the class Dodecandria, order Trigynia.—Generic Character. *Calix:* perianth one-leafed, parted; parts narrow, acute, erect, permanent, two of which gape more for the use of the melliferous petal. *Corolla:* petals three, five, and six, in number, some unequal, some of them always half three-cleft; the uppermost gibbous at the base, melliferous, the length of the calix; nectary a flat upright gland, produced from the receptacle, placed on the uppermost side between the stamina and the uppermost petal, converging with the dilated base of the petals. *Stamina:* filamenta eleven or fifteen, short; antheræ erect, obtuse, the length of the corolla. *Pistil:* germen gibbous, ending in three or four very short styles; stigmas simple. *Pericarp:* capsule gibbous, angular, acuminate between the styles, gaping between them, one-celled. *Seeds:* very many, kidney-form, fastened to the angles of the capsules. *Observe.* There is scarcely any genus, the character of which is so difficult to be determined, for the several species sport both in number and figure. The essential character consists in the trifid petals, one of them melliferous at the base; and in the capsule not being closed, but always gaping. The first species has a four-parted perianth; three petals, the uppermost melliferous and half six-cleft, the sides opposite and trifid; two very small entire petals are frequently added below the others; styles three; stamina very many. The eighth species has the perianth six-parted; petals six, almost equal, all half three-cleft; styles four; capsule quadrangular; stamina always eleven. Some other species have the perianth five-parted; five dissimilar trifid petals; three styles; and very many stamina. Essential Character. *Calix:* one-leafed, parted. *Petals:* laciniate. *Capsule:* gaping at the mouth, one-celled, many-seeded.——The species are,

1. Reseda Luteola; *Dyer's Weed, Yellow Weed, Woold, Wild Woad,* or *Weld.* Leaves lanceolate, entire, flat; calix four-cleft. Root annual or biennial, fusiform, small; stem from a foot to three feet in height, upright, grooved, hollow, leafy, branched; spikes terminating, upright, but bending at top, very long, sometimes having three hundred and fifty flowers or more; each flower stands single on a short pedicel, and has one awl-shaped yellow bracte at the base; they are of a pale yellow colour, about one-sixth of an inch in diameter, but have little smell. Linneus observes, that the nodding spike of flowers follows the course of the sun even when the sky is covered, pointing towards the east in a morning, to the south at noon, westward in the afternoon, and north at night. Cattle, sheep excepted, do not eat this plant. Dyers make considerable use of it; for it yields a most beautiful yellow dye for cotton, woollen, mohair, silk, and linen. Blue cloths are dipped in a decoction of it, in order to become green. The yellow colour of the paint called Dutch Pink is obtained from this plant, the whole of which, when it is about flowering, is pulled up for the use of the dyers, who employ it both fresh and dried.—Native of the most temperate parts of Europe, in wild pastures, fallow fields, waste places, and on dry banks and walls; flowering in June and July. It must be carefully distinguished from the true Woad, or *Isatis Tinctoria.*—The best way to cultivate this plant is, to sow it without any other crop, in the beginning of August. Plough and harrow the ground fine, but, unless very poor, it will not require dung: the seed should then be sown; one gallon, as it is small, being sufficient for an acre. If rain fall in a little time after the seeds are sown, it will soon bring up the plants, and in two months' time they will be so far advanced as to be easily distinguished from the weeds, and should then be hoed in the same manner as Turnips. This should be done in dry weather, and, if well performed, the plants will be clean from weeds till the spring; but as young weeds will come up in March, so, if in dry weather the ground be hoed again, it may be performed at a small expense while the weeds are young, and then they will soon decay; and if after this there should be many more weeds appear, it will be proper to hoe it a third time, about the beginning of May, which will preserve the ground clean till the Weld is fit to pull. The best time to pull it, is as soon as it begins to flower; though most people stay till the seeds are ripe, being unwilling to lose the seeds. But it is much better to sow a small piece of land with this seed, to remain for a produce of new seeds, than to let the whole stand for seed; because the plants which are permitted to stand so long will be much less worth for use than the value of the seeds: besides, by drawing off the crop early, the ground may be sown with wheat in the same season; for the plants will be drawn up in the latter end of June, when they will be in the greatest vigour, and afford a greater quantity of dye. When they are pulled, set them up in small handfuls to dry in the field; and when dry, tie them up in bundles, and house them in that state; and stack them loosely, that the air may penetrate, and prevent fermentation. That which is left for seeds should be pulled as soon as the seeds are ripe, and set up to dry, and then beat out for use; for if the plants are left too long, the seeds will scatter. The usual price of seed is ten shillings per bushel.

2. Reseda Canescens; *Hoary Base Rocket.* Leaves lanceolate, waved, hairy; branches hispid. Root perennial; stems decumbent, branched, round, leafy, rough, with minute white bristly hairs; flowers in long, terminal, stalked, hairy clusters, with white petals.—Found near Cairo.

3. Reseda Glauca; *Glaucous Base Rocket.* Leaves linear, toothed at the base; flowers four-styled.—Native of the south of Europe.

4. Reseda Dipetala; *Flax-leaved Base Rocket.* Leaves linear, quite entire; flowers four-styled, two-petalled; petals undivided. Stem somewhat shrubby, erect, with round branches. It flowers in August, and is biennial.—Native of the Cape.

5. Reseda Purpurascens; *Purplish Base Rocket.* Leaves linear, obtuse; flowers five-styled. Root thickish, white, hard, perennial; flowers many, crowded, of an herbaceous purplish colour; seed small, blackish.—Native of the south of Europe.

6. Reseda Sesamoides; *Spear-leaved Base Rocket.* Leaves lanceolate, entire; fruits stellate. Root perennial; stems several, prostrate, a palm and half in height, striated, somewhat angular; flowers in very long racemes, subsessile; petals white. It flowers in July and August.—Native of the south of France.

7. Reseda Fruticulosa; *Shrubby Base Rocket.* Leaves pinnate, recurved at the tip; flowers four-styled; calices spreading, five-parted; stem shrubby at the base.—Native of Spain.

8. Reseda Alba; *Upright White Base Rocket.* Leaves pinnate; flowers four-styled; calices five-parted. It flowers from May to October. An hardy annual or biennial; ornamented throughout the summer with copious dense spikes of elegant white flowers.—Native of the south of Europe.

9. Reseda Undata; *Waved-leaved Base Rocket.* Leaves pinnate, waved; flowers three to five styled; root perennial.—Native of Spain and Italy.

10. Reseda Lutea; *Yellow Base Rocket, Base Dyer's Weed,* or *Wild Mignionette.* All the leaves trifid, lower pinnate; calix six-cleft. Root annual, somewhat woody. There are several varieties.—Native of most parts of Europe,

in meadows and corn-fields, on calcareous soils, as also on walls. It flowers from June to the end of autumn.

11. Reseda Phyteuma; *Scentless Mignonette.* Leaves entire, or three-lobed; calices six-parted, segments very large; petals four, more or less pectinated. This is an annual plant, which has generally a single fleshy tap-root, running deep in the ground, sending out several trailing stalks, nearly a foot long, and dividing into smaller branches. The ends of the branches are terminated by loose spikes of flowers, standing upon pretty long peduncles. Dalibard having cultivated this plant, found it, after some generations, to become like Sweet Mignonette. He then sowed the seeds of this, which was become sweet by cultivation, in its natural dry soil, and it lost all its smell, returning to its original state. It flowers from June to September.—Native of the south of Europe and Barbary, in dry sandy soils.

12. Reseda Mediterranea. Leaves entire, or three-lobed; calices shorter than the flower. Stem a foot high, ascending or upright, branched at top, rugged; corolla six-petalled, white.—Native of Palestine.

13. Reseda Odorata; *Sweet Mignonette.* Leaves flat, undivided, or three-lobed; calices equalling the flowers; segments of the petals all very deep, somewhat spatulate. Root composed of many strong fibres, which run deep into the ground; stems several, about a foot long, dividing into many small branches. The flowers are produced in loose spikes at the ends of the branches, on pretty long stalks, and have large calices; the corollas are of an herbaceous white colour, and smell like the Vine-blossom, or the fruit of the Raspberry. Mr. Miller observes, that this, and the eleventh species, are so much alike, as by some persons to be taken for the same. The luxury of the pleasure-garden, observes Mr. Curtis, is greatly heightened by the delightful odour which this plant diffuses; and as it grows more readily in pots, its fragrance may be conveyed into the house. The odour, though not so refreshing as that of the Sweet Briar, is not apt to offend the most delicate olfactories. Hence the French call it Mignonette, or Little Darling; to which Cowper alludes, when he terms it "the Frenchman's favourite." It flowers from June till the commencement of winter.—It is raised from seeds, which should be sown on a moderate hot-bed in March, and when the plants are strong enough to transplant, they should be pricked out upon another moderate hot-bed, to bring them forward; but must have a large share of free air in warm weather, to prevent their being drawn up weak. About the end of May they may be removed into pots, and placed in or near dwellings; and some in warm borders, to flower and seed, for those which grow in the full ground often produce more seeds than those in pots: when the seed-vessels begin to swell, the plants are frequently infested with green caterpillars, which, if not destroyed, will eat off all the seed-vessels, or, they may be sown in pots of light earth, and plunged into the hot-bed, which is probably the better practice.—If the seeds are sown on a light bed of earth in April, the plants will come up very well, and, when they are not transplanted, will grow larger than those raised in the hot-bed, but will not flower so early, and hardly ripen their seeds in cold seasons. In a warm dry border, however, the seed will come up spontaneously, and grow very luxuriantly: but, to have the flowers early in spring, the seeds should be sown in pots in autumn, kept in frames through the winter, or on a gentle hot-bed in spring. These plants may also be preserved through the winter in a green-house, where they will continue flowering most part of the year, but in the second year will not be so vigorous as the first.

Rest Harrow. See *Ononis.*

Restio; a genus of the class Diœcia, order Triandria. —GENERIC CHARACTER. *Male. Calix:* ament, ovate or oblong, many-flowered; scales coriaceous, keeled; perianth four or six leaved, compressed, nearly equal; of which two of the outer are boat-shaped, the third flat; the three inner, lanceolate, thinner, one wider than the others. *Corolla:* none, except the three inner glumes. *Stamina:* filamenta three, flattish; antheræ oblong. *Female,* on a separate plant. *Calix* and *Corolla:* as in the male. *Pistil:* germen three-sided; style single, rarely double, very rarely triple; stigma seldom simple, very frequently two, very rarely three, feathered. *Pericarp:* capsule two or three lobed, and as many celled, bursting at the angles. *Seeds:* solitary, oval. ESSENTIAL CHARACTER. *Male. Ament:* imbricated. *Perianth:* four or six leaved, shorter than the scales of the ament, destitute of internal scales. *Corolla:* none. *Antheræ:* peltate. *Female. Ament* and *Perianth:* as in the male. *Stigmas:* two or three. *Capsule:* of two or three lobes, and as many cells, bursting at the angles. *Seeds:* solitary.——The species are,

1. Restio Paniculatus. Stem frondose; spikes panicled. —Native of the Cape.

2. Restio Verticillaris. Branches in whorls, jointed; panicle compound, contracted; branches in whorls about the stem. Stem five or six feet high, resembling an Equisetum in its copious, slender, whorled branches from every joint. —Native of the Cape.

3. Restio Dichotomus. Culms dichotomous; spikes solitary.—Native of the Cape; where it is made use of for besoms.

4. Restio Vimineus. Culms simple; spikes corymbed.— Native of the Cape.

5. Restio Triflorus. Culms simple, leafy; spikes alternate, sessile.—Found at the Cape.

6. Restio Simplex. Culm simple; spike terminating.— Found at New Zealand, as well as at the Cape.

7. Restio Elegia. Culms simple; spike glomerate; spathes partial, vague, simple.—Native of the Cape.

8. Restio Cernuus. Culm simple, leafless; spikes turbinate, pendulous; scales blunt with a point.—Native of the Cape.

9. Restio Tectorum. Culm simple, leafless; raceme compound, erect.—Native of the Cape; where the houses are commonly thatched with this species, both in town and country, and sometimes whole huts are built with it. A roof thus thatched will last twenty or thirty years; and would last much longer, if the south-east wind did not blow so much dirt into it as to cause it to rot.

10. Restio Imbricatus. Culm simple, leafless; spike oblong, compressed.—Native of the Cape.

11. Restio Vaginatus. Culm simple, leafless; spikes alternate, erect; scales acuminate.—Native of the Cape.

12. Restio Aristatus. Culm simple, leafless; spikes terminating, obovate, erect; scales awned.—Native of the Cape.

13. Restio Umbellatus. Culm simple, leafless; spikes umbelled, ovate; scales oblong, blunt.—Native of the Cape.

14. Restio Spicigerus. Culm simple, leafless; spikes oblong, hexagonal; scales lanceolate, patulous at the tip.— Native of the Cape.

15. Restio Acuminatus. Culm simple, leafless; panicle simple, erect; scales awned.—Native of the Cape.

16. Restio Parviflorus. Culm simple, leafless; panicle erect; scales rounded, membranaceous.—Native of the Cape.

17. Restio Erectus. Culm simple, leafless; panicle erect, involucred; spathes imbricate-lanceolate.—Native of the Cape.

18. Restio Argentio. Culm simple, leafless; panicle erect; scales lanceolate, scariose.—Native of the Cape.

19. Restio Scariosus. Culm simple, leafy; scales of the spikes lanceolate, scariose.—Native of the Cape.

20. Restio Thamnochortus. Culm simple, leafy; panicle spreading; scales lanceolate-scariose at the edge.—Native of the Cape.

21. Restio Fruticosus. Culm simple, leafy; panicle compound; scales scariose, jagged.—Native of the Cape.

22. Restio Tetragonus. Culm and branches four-cornered; spikes alternate.—Native of the Cape.

23. Restio Triticeus. Culm dichotomous, leafless, erect; branches round; spikes alternate.—Native of the Cape.

24. Restio Glomeratus. Culm dichotomous, leafless, even; panicle glomerate.—Native of the Cape.

25. Restio Incurvatus. Culm dichotomous, leafless, striated; spikes imbricate, aggregate.—Native of the Cape.

26. Restio Digitatus. Culm dichotomous, leafless; branches round; spikes in threes, oblong.—Native of the Cape.

27. Restio Scopa. Culm dichotomous, leafy; branches compressed; spikes of the panicle conglomerate.—Native of the Cape.

28. Restio Virgatus. Culm dichotomous, leafy; branches compressed; spikes panicled, pendulous.—Native of the Cape.

Retzia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, five-parted; segments unequal, lanceolate, acute. *Corolla:* one-petalled, tubular, cylindrical, villose within and without, five-toothed; segments ovate, blunt, concave, erect, very hirsute at the tip. *Stamina:* filamenta five, awl-shaped, shorter than the corolla; antheræ compressed, sagittate. *Pistil:* germen superior, oblong; style filiform, longer than the corolla; stigma bifid. *Pericarp:* capsule oblong, two-celled, two-valved, acute, two-grooved. *Seeds:* several, minute. Essential Character. *Corolla:* cylindrical, villose on the outside. *Stigma:* bifid. *Capsule:* two-celled.——The only known species is,

1. Retzia Spicata. Stem shrubby, erect, four to seven feet high, with round, knotty, hairy, leafy, branches; leaves densely imbricated, somewhat whorled, linear-lanceolate, rigid, acute, thick-edged, entire, two inches in length; flowers axillary, sessile, solitary, villose externally, dark purple within.—Native of the Cape, on the highest mountains.

Rhamnus; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* none, unless the corolla be so called. *Corolla:* petal imperforate, externally rude, internally coloured, funnel-form; tube turbinate, cylindrical; border spreading, divided, acute; scalelets fine, very small, each at the base of each division of the border, converging. *Stamina:* filamenta as many as there are segments of the corolla, awl-shaped, inserted into the petals under the scalelet; antheræ small. *Pistil:* germen roundish; style filiform, the length of the stamina; stigma blunt, divided into fewer segments than the corolla. *Pericarp:* berry roundish, naked, divided into fewer parts internally than the corolla. *Seeds:* solitary, roundish, gibbous on one side, flatted on the other. *Observe.* That part of the flower which is here called the corolla, is more properly the perianth; and the scalelets, placed close to the stamina, should be named the petals. The first species has a four-cleft stigma, a four-seeded berry, and a four-cleft corolla: it is diœcous, and four-stamined. The twenty-first has an emarginate stigma, a four-seeded berry, and a five-cleft corolla. The thirty-first has a trifid stigma, a three-seeded berry, and a five-cleft corolla: it is polygamous-diœcous, with males and hermaphrodites: the scalelets of the corolla are wanting. The forty-first species has two styles, a two-celled nucleus, and a five-cleft corolla. Drupe. Essential Character. *Calix:* tubular. *Corolla:* scales defending the stamina, inserted into the calix. *Berry:* superior.——The species are,

* *Thorny.*

1. Rhamnus Catharticus; *Purging Buckthorn.* Spines terminating; flowers quadrifid, diœcous; leaves ovate; stem erect; berry four-seeded. It rises with a strong woody stem to the height of twelve or fourteen feet, sending out many irregular branches, ending in strong thorns; leaves serrated, with several lateral ribs. The flowers come out in clusters from the side of the branches, and are yellowish-green. Berries black, the size of a small pea, four-celled, four-seeded. The juice of the unripe berries has the colour of saffron, and is used for staining maps or paper; and are sold under the name of French Berries. The juice, when ripe, mixed with alum, is the sap-green of the painters; but if the berries be gathered late in the autumn, the juice is purple. The bark also affords a beautiful yellow dye. The inner bark, like that of the Elder, is said to be a strong cathartic, and to excite vomiting. The berries operate briskly by stool, but occasion thirst, and dryness of the mouth and throat, accompanied frequently with severe griping of the bowels, unless some diluting liquor be plentifully taken with it. The juice made into a syrup is the officinal preparation: about an ounce is a moderate dose; and it was formerly much employed as a hydragogue, from one to two ounces being given at a time. It is now falling into disuse, and is rarely prescribed, except in conjunction with other medicines of this class. It is said that the flesh of the birds which feed upon these berries is purgative.—This plant is common in the hedges of many parts of England, and throughout Europe, especially in moist situations. It rises easily from seeds, if they are sown in autumn, soon after the berries are ripe; for if kept out of the ground till spring, they will not come up till the year after. They may be managed like any other hardy deciduous tree or shrub, and can be propagated by cuttings or layers. If the young shoots be layed in autumn, they will put out roots by the following autumn, when they may be taken off, and either planted in a nursery to get strength for a year or two, or where they are designed to remain. It is not so proper for hedges as the Hawthorn or Crab.

2. Rhamnus Infectorius; *Dwarf Yellow-berried Buckthorn.* Spines terminating; flowers quadrifid, diœcous; leaves ovate-lanceolate, repand, serrulate; stem procumbent. The unripe berries are much used for dyeing, and imported in great quantities into England: they are what gives the yellow colour to Turkey leather or yellow morocco.—Native of the south of Europe. This, and the seventh species, are chiefly preserved in botanic gardens. Lay down the branches in autumn, or plant cuttings in the spring, before the buds begin to swell, and treat them in the same way as the common species.

3. Rhamnus Lycioides. Spines terminating; leaves linear, quite entire, blunt. This shrub is about three feet high, very much branched, the branches spreading, and terminating by a spine. Native of some parts of Spain, where it grows plentifully upon calcareous mountains.

4. Rhamnus Erythroxylon; *Siberian Redwood.* Spines terminating; leaves linear-lanceolate, serrate, sharpish. This shrub is six feet high. Wood very hard, rigid, of an orange red colour, but frequently of a deeper red. There is another sort so nearly resembling this, that it is difficult to determine which is the species, and which the variety.—They are both natives of Siberia, on the banks of the Selenga and

neighbouring rises of Mongolia, and in the open Pine woods, in warm situations. The berries afford a deep yellow dye; and the Mongols use the wood to make their images, on account if its colour and hardness.

5. Rhamnus Oleoides; *Olive-leaved Buckthorn.* Spines terminating; leaves oblong, quite entire. This is an upright shrub, with branches becoming thorny at the end. There are two varieties: one with smaller leaves, ovate, or ovate-oblong, like those of the Box; the other with linear lanceolate leaves. Fruit solitary, resembling that of the first species.—Native of Spain and Barbary.

6. Rhamnus Crenulatus; *Teneriffe Buckthorn.* Branchlets spinescent; flowers quadrifid or trifid, diœcous; leaves oblong, bluntly serrate, evergreen. A stout, erect, branchy shrub, the leaves finely reticulated beneath.—Native of the island of Teneriffe.

7. Rhamnus Saxatilis; *Rock Buckthorn.* Spines terminating; flowers quadrifid, hermaphrodite; leaves ovate-acute, serrated, deciduous. It is a very low shrub, much branched, forming an impregnable bush by presenting its thorns every way. It very much resembles the first species, and is cultivated in the same manner.—Native of Germany, France, and Italy.

8. Rhamnus Theezans; *Tea Buckthorn.* Spines terminating; leaves ovate, serrulate; branches divaricating.—Native of China. Osbeck says, this shrub grows a fathom in height, with leaves like those of the Common Tea; as a substitute for which, the poor use the leaves of this plant.

** *Unarmed.*

9 Rhamnus Sarcomphalus; *Bastard Lignum Vitæ.* Leaves oval, coriaceous, quite entire, emarginate; flowers in dense, corymbose, silky tufts. This tree rises generally to a very considerable height: the trunk is often above two feet and a half in diameter, and covered with a thick scaly bark. The wood is hard, of a dark colour, and close grain; and is reckoned one of the best sorts of timber in the island.—Native of Jamaica.

10. Rhamnus Ferreus. Flowers hermaphrodite, umbelled, axillary; leaves oblong-ovate, emarginate, quite entire, smooth, membranaceous. The branches are round and scattered.—Native of the island of Santa Cruz.

11. Rhamnus Lævigatus. Flowers hermaphrodite, axillary, subgeminate; leaves oblong, quite entire, coriaceous, smooth.—Native of Santa Cruz.

12. Rhamnus Tetragonus; *Square-branched Buckthorn.* Leaves ovate, entire, smooth, sessile; branches four-cornered.—Native of the Cape.

13. Rhamnus Polifolius. Flowers hermaphrodite, axillary, subsessile; leaves lanceolate, quite entire, white, tomentose underneath; branches slender, tomentose above, hoary.—Native of New Zealand.

14. Rhamnus Valentinus; *Valentia Bucktnorn.* Flowers hermaphrodite, quadrifid, three-styled; capsules three-celled; leaves roundish-ovate, subcrenate. Stems short and depressed.—Native of Valencia in Spain.

15. Rhamnus Cubensis; *Cuba Buckthorn.* Flowers hermaphrodite; capsules three-celled; leaves wrinkled, quite entire, tomentose. This has the same kind of flower and fruit as the next species.—Native of Cuba.

16. Rhamnus Colubrinus; *Pubescent Rhamnus,* or *Buckthorn Redwood.* Flowers hermaphrodite, one-styled, erect; capsules tricoccous; leaves ovate, entire; petioles ferruginous-tomentose. This is an upright tree, with most of the branches spreading out horizontally. In high mountain-woods it attains the height of twenty feet, while in coppices on the coast it is rarely seven feet high, with leaves four inches long; whereas in the former they are half a foot in length. The nap in Cuba is silvery, in the other islands always ferruginous. In the island of Martinico, the French know it by the name of *Bois Couleuvre,* or Snakewood.—Native of several islands of the West Indies, where it flowers in January, June, and November.—Sow the seeds upon a hot-bed in the spring; and when the plants are fit to remove, put them separately in small pots filled with light sandy earth: plunge them into the tan-pit, and shade them till they have taken root; then treat them in the same manner as other tender exotic plants. In the autumn, place them in the bark-stove, and water them sparingly in winter.

17. Rhamnus Volubilis; *Twining Buckthorn.* Flowers hermaphrodite, one-celled; leaves oblong-ovate, nerved, somewhat waved; stem twining. It flowers here in June and July.—Native of Carolina.

18. Rhamnus Dauricus; *Daurian Buckthorn.* Flowers diœcous, quadrifid; leaves oblong, ovate, serrate, veined. This small tree very much resembles the first species; but is taller, bushy, with thicker branches, less spreading, and never having any thorns. The wood is red, and called sandal-wood by the Russians.—Native of the Dauria, by the river Argunus.

19. Rhamnus Alpinus; *Alpine Buckthorn.* Flowers diœcous; leaves oval-lanceolate, glandular, crenulate; veins hairy at the back; stem erect.—Native of the mountains of Germany, Switzerland, the south of France, and Italy.

20. Rhamnus Pumilus; *Dwarf Buckthorn.* Creeping; flowers hermaphrodite; leaves petioled, ovate, crenate. This differs from the next species by its stems adhering to the rocks, covering them like Ivy.- Native of Germany, Carniola, Dauphiny, Monte Baldo and Spain.

21. Rhamnus Frangula; *Alder Buckthorn, Black Alder,* or *Berry-bearing Alder.* Flowers hermaphrodite, one-styled; leaves obovate, entire, smooth; berry two-seeded. This rises with a woody stem to the height of four or five feet, sending out many irregular branches, covered with a dark bark. The leaves are two or three inches long and one broad, somewhat pointed; and the flowers whitish, with very minute petals and stamens. The flowers appear in June, and the berries ripen in September. There are two varieties found on the mountains of Europe. The berries of the Berry-bearing Alder, and also of the Cornel, are said to be brought to market for those of the true Buckthorn: they are, however, easily distinguished, the latter having four seeds, this species only two, and the *Cornus* one nut enclosing two kernels.—Half an ounce of the inner yellow bark boiled in beer, is an effectual purge, and often proves serviceable in the dropsy, and constipations in the bowels of cattle, &c. but in the latter case a larger quantity will be necessary. Country people frequently make use of the bark boiled in ale as a purgative in the jaundice, dropsy, and other similar complaints; but it commonly operates with violence, and, unless corrected by the addition of some warm aromatic substance, frequently occasions severe gripings, sickness, and sometimes vomiting. The unripe berries dye wool green, and the bark affords a yellow dye.—Native of the north of Europe, in bushy places. Sow the seeds of this plant as soon as they are ripe. Keep the plants clean till autumn, and then plant them in a nursery, in rows two feet asunder, and at one foot distance in the rows. Here let them remain two years, and then plant them where they are to remain. This shrub may also be increased by layers or cuttings; but the seedling plants are the best.

22. Rhamnus Latifolius; *Azorian Buckthorn.* Flowers hermaphrodite, one-styled; calices villose; leaves elliptic, quite entire. A tall upright shrub.—Native of the Canaries.

23. Rhamnus Glandulosus; *Madeira Buckthorn.* Flowers racemed; leaves ovate, bluntly serrate, smooth, glandular at the base. It has the habit of an Ilex or Phillyrea.—Native of Madeira and the Canary Islands.

24. Rhamnus Ellipticus; *Oval-leaved Buckthorn.* Flowers hermaphrodite, subtrigynous, axillary, subumbelled; leaves elliptic, acute, quite entire, somewhat villose underneath. Flowers greenish-white.—Native of the West Indies.

25. Rhamnus Prinoides; *Prinos-leaved Buckthorn.* Flowers polygamous; styles subtriple; leaves ovate, serrate.—Native of the Cape.

26. Rhamnus Mystacinus; *Wiry Buckthorn.* Flowers hermaphrodite, in axillary umbels; stigma triple; leaves cordate; branches tendril-bearing; stem shrubby, round, ten feet high. It flowers in November.—Native of Abyssinia.

27. Rhamnus Alnifolius; *Alder-leaved Buckthorn.* Flowers hermaphrodite; leaves oval, acuminate, serrate, netted underneath.—Native of North America.

28. Rhamnus Sphærospermus; *Round-berried Buckthorn.* Flowers hermaphrodite, in racemelets; berries roundish, three-celled, pellucid; leaves oblong, serrate, smooth. Trunk ten or fifteen feet high, with a smooth bark.—Native of the most temperate parts of Jamaica, in mountain coppices; flowering in August, and ripening the berries in October.

29. Rhamnus Hybridus; *Mule Buckthorn.* Flowers androgynous; leaves oblong, acuminate, scarcely perennial. L'Heritier obtained this spurious plant half a century since from the seeds of the nineteenth species. He observed the mother, which was absolutely a female plant, and separated from males, every year: and he asserts, that the thirty-first species was certainly the father. He adds, that seeds sown abundantly in some provinces of France, constantly produced this spurious plant without ever varying. It has something from both parents; as, the herb of the mother; the leaves between both; but approaches the father in substance, and is almost perennial.

30. Rhamnus Lineatus. Flowers hermaphrodite; leaves ovate, marked with lines, repand, netted underneath; peduncles one-flowered, axillary; stem erect. Osbeck says, that this species often grows to the height of a man, and is remarkable for its small beautiful leaves, of a yellow green colour beneath, with red veins.—Native of China and Ceylon.

31. Rhamnus Alaternus; *Common Alaternus.* Flowers diœcous, in axillary, somewhat compound, bracteated clusters; stigma triple; leaves ovate, serrate, coriaceous, smooth; stem erect. A hardy evergreen shrub in our gardens, flowering in the spring. The leaves are about an inch long, of a shining yellowish-green, and of a thick rigid texture. Flowers copious, yellowish; berries dark purple, with two or three seeds.—Native of the south of Europe.—Mr. Miller reckons four sorts of Alaternus. There is one variety with variegated leaves, commonly called Blotched Phillyrea by the nurserymen; and another, the leaves of which are striped with white and with yellow, called Silver and Gold-striped Alaternus.—The Alaternus was much more in request formerly than at present; having been planted against walls in court-yards to cover them, as also to form evergreen hedges in gardens; but for which purpose it is very improper, for the branches shoot vigorously, and, being pliant, are frequently displaced by winds in winter; and when much snow falls in still weather, the weight of it often breaks the branches; these hedges also require clipping three times in a season, to keep them in order; which is not only expensive, but occasions a great litter in the garden. It is still occasionally used in towns for concealing walls, but chiefly to make a variety in ornamental plantations. Clusius reports, that the Portuguese fishermen dye their nets red with a decoction of the bark; and that dyers there use small pieces of the wood to strike a blackish-blue colour. The fresh branches or young shoots, with the leaves, will dye wool a fine yellow. The honey-breathing blossoms, says Evelyn, afford an early and marvellous relief to the bees. He also informs us, that he first brought this plant into general use and reputation in this kingdom. The flowers appear in April.—It is easily propagated by laying the branches down, as is practised for many other trees. The best time for this is in autumn, and, if properly performed, the layers will have made good roots in a year; they may then be cut off from the old stock, and planted either into the nursery, or into the places where they are intended to remain. When they are planted in a nursery, they should not remain there longer than a year or two; for as they shoot their roots to a great distance on every side, so they cannot be removed after two or three years' growth without cutting off great part of them, which is very hurtful to the plants, and will greatly retard their growth, even if they survive their removal. They may be transplanted either in the autumn or the spring, but in dry lands the autumn planting is best, whereas in moist ground the spring is to be preferred. The plain sorts may also be propagated by sowing their berries, which they produce in great plenty; but the birds devour them so greedily as soon as they begin to ripen, that they at that time require to be particularly guarded. The plants which arise from seeds always grow more erect than those which are propagated by layers, and are therefore fitter for large plantations, as they may be trained up to stems, and formed more like trees; whereas the layers are apt to extend their lower branches, which retards their upright growth, and renders them more like shrubs. They will grow to the height of eighteen or twenty feet, if their upright shoots be encouraged; but to keep their heads from being broken by wind or snow, those branches which shoot irregularly should be shortened. The varieties of this species thrive best in a dry, gravelly, or sandy soil, for in rich ground they are often injured by frost when the winters are severe, but in rocky dry land they are seldom injured, and if in very hard frosts their leaves are killed, the branches will remain unhurt, and put out new leaves in the spring.

32. Rhamnus Carpinifolius; *Hornbeam-leaved Buckthorn.* Leaves oblong, lanceolate, equally toothed, acute; fruits sessile. Trunk straight, very much branched, and forming a kind of bush, with the branches extending frequently to twenty paces, and to a considerable height. The wood is white and brittle, the bark brown and entire, covered with a whitish grey skin. Pallas observes, that the genus of this tree is uncertain, the flowers not having been observed, nor the fruit in a ripe state, by any botanist. Some suppose it to be the same with *Ulmus Nemoralis.*—Native of Siberia.

33. Rhamnus Carolinianus. Leaves ovate-oblong, somewhat entire, glabrous; umbels peduncled; flowers hermaphrodite, tetrandrous, monogynous; stigma bilobed, fruits globose, black.—Found in the woods and swamps of Virginia and Carolina, and flowers from May to July.

34. Rhamnus Lanceolatus. Plant arboresent; leaves lanceolate, serrulate, acute, pubescent; berries black.—Grows in Tennessee on the side of hills.

35. Rhamnus Minutiflorus. Leaves subopposite, oval, serrate; flowers very small, diœcous, alternately sessile; style trifid; berry with three seeds.—Grows on the sea-coast of Carolina and Florida.

*** *Prickly.*

36. Rhamnus Paliuris; *Common Christ's Thorn.* Prickles in pairs, the lower reflexed; flowers three-styled; fruits cori-

aceous, winged. This tree rises with a pliant shrubby stalk to the height of eight or ten feet, sending out many weak slender branches. From the singular appearance of the fruit, like a head with a broad-brimmed hat on, the French call it *Porte Chapeau*. Many persons suppose it to be the plant from which the crown of thorns, which was put upon the head of our Saviour, was composed; the possibility of which is supported by many travellers of credit, who affirm that this is one of the most common shrubs in the country of Judea: and from the pliableness of its branches, which may easily be wrought into any figure, the supposition derives some probability, though Hasselquist alone thinks it was the forty-fifth species.—The seeds of this plant ought to be procured from the southern countries of Europe, and to be sown as soon as possible after they arrive, on a bed of light earth, and the plants will come up in the following spring. The seedlings may be transplanted the following season into a nursery, to get strength before they are planted out for good. It may also be propagated by laying down its tender branches in the spring of the year, which, if carefully supplied with water in dry weather, will take root in a year's time, and may then be taken off from the old plant, and transplanted where they are to remain. The best time for transplanting them is in autumn, soon after the leaves decay, or the beginning of April, just before it begins to shoot; observing to lay some mulch upon the ground about their roots, to prevent them from drying, and also to refresh them now and then with a little water, until they have taken fresh root, after which they will require but little care. They are very hardy, and will grow ten or twelve feet high, in a dry soil and warm situation.

37. Rhamnus Lotas; *The Genuine Lotus.* Prickles in pairs, one of them recurved; leaves ovate, crenate; fruit round. This is a very branching shrub. It is the famous Lotus mentioned by Pliny and Polybius: the late Mr. Park describes the fruit as small farinaceous berries, of a yellow colour and delicious taste. The natives of Africa, he says, convert them into bread, by exposing them some days to the sun, and afterwards pounding them gently in a wooden mortar until the farinaceous part is separated from the stone. The meal is then mixed with a little water, and formed into cakes, which, when dried in the sun, resemble in colour and flavour the sweetest gingerbread. The stones are afterwards put into a vessel of water, and shaken about so as to separate the meal which may still adhere to them; this communicates a sweet and agreeable taste to the water, and, with the addition of a little pounded millet, forms a pleasant gruel called *fondi*; which is the common breakfast, in many parts of Ludamar, during the months of February and March. The fruit is collected by spreading a cloth upon the ground, and beating the branches with a stick. Mr. Browne informs us, that the Arabic name of the Lotus is *Nebbek*, and that there are two species of it in Dar-Fur, the largest of which is called *Nebbek-el-aruh*. The natives eat the fruit fresh or dry, for it dries on the tree, and so remains during great part of the winter months; and in that state is formed into a paste of not unpleasant flavour, and is a portable provision on journeys.—This plant is frequent on the banks of the lesser Syrtis, near Cassa, Tozzer, Kerwan, &c. flowering early in the spring, and ripening the fruit in autumn. It has been found at the eastern as well as the western extremity of the African desert; and it appears that it is disseminated over the edge of the great desert, from the coast of Cyrene round by tripoly and Africa Proper, to the border of the Atlantic, the Senegal, and Niger. Major Rennell saw the same kind of shrub or fruit, or what is exceedingly like it, in Bengal, in dry situations on the banks of the Ganges, where the people eat the fruit as we eat sloes or wild berries.

38. Rhamnus Napeca. Prickles often in pairs, recurved; peduncles corymbed; flowers semidigynous; leaves ovate, oblique, subcrenate, even on both sides.—Native of the islands of Ceylon and Amboyna.

39. Rhamnus Jujuba; *Blunt-leaved Buckthorn.* Prickles solitary, recurved; leaves roundish, ovate, blunt, tomentose underneath; peduncles aggregate; flowers semidigynous. The flowers come out in clusters from the wings of the branches, are small, of a yellowish colour, and are succeeded by oval fruit about the size of small olives, inclosing a stone of the same shape.—Native of the East Indies, and cultivated in China and Cochin-china. This plant, and the six following species, are preserved in gardens for the sake of variety, as they do not produce fruit in England.

40. Rhamnus Xylopyrus; *Sharp-leaved Buckthorn.* Prickles solitary, recurved; leaves subcordate, ovate, sharpish, tomentose underneath; corymbs axillary, clustered. This resembles the preceding very much, but the fruit is the size of a cherry, or a little larger, and insipid: the prickles also are fewer.—Native of deserts at the feet of mountains in the East Indies.

41. Rhamnus Oenopla; *Pointed-leaved Buckthorn.* Prickles solitary, recurved; leaves half-cordate, acuminate, tomentose underneath; peduncles aggregate. This is very distinct from its congeners, by the great obliquity of its leaves, which are almost half-cordate, acuminate.—Native of Ceylon.

42. Rhamnus Capensis; *Prickly Cape Buckthorn.* Prickles solitary; leaves ovate, cut out, entire, smooth; umbels axillary.—Native of the Cape.

43. Rhamnus Circumcissus; *Prickly East Indian Buckthorn.* Prickles solitary, hooked; leaves obovate, abrupt, emarginate, entire, smooth; umbels axillary.—Native of the East Indies.

44. Rhamnus Zizyphus; *Shining-leaved Buckthorn,* or *Common Jujube.* Prickles in pairs, one recurved; leaves ovate, retuse, toothed, smooth; flowers two-styled. This has a woody stalk, dividing into many crooked irregular branches, armed with strong thorns, set by pairs at each joint; the leaves are two inches long, and one broad, slightly serrate, on short footstalks; the flowers are produced on the sides of the branches, two or three from the same place, sessile, small, and yellow; the fruit oval, the size of a middling plum, sweetish and clammy, including a hard oblong stone, pointed at both ends.—Native of the south of Europe, China, Cochin-china, and Japan. It is sold in the market at Canton during the autumn. In Italy and Spain, it is served up at the table in desserts during winter, as a sweetmeat. Ray saw it in Calabria, growing wild in great abundance.—This, the 39th, and next species, may be propagated by putting their stones into pots of fresh light earth soon after their fruits are ripe; and in winter they should be placed under a common hot-bed frame, where they may be sheltered from severe frost. In the spring, these pots should be plunged into a moderate hot-bed, which will greatly forward the growth of the seed; and when the plants are come up, they should be inured to the open air by degrees, into which they must be removed in June, placing them near the shelter of a hedge, and watering them frequently in very dry weather. In this situation they must remain till the beginning of October, when they must be removed into the green-house, or placed under a hot-bed frame, where they may be defended from frost, but should have as much free air as possible in winter during mild weather. In March, just before the plants begin to shoot, they should be transplanted each into

a separate small pot, filled with fresh light earth; and if they are plunged into a moderate hot-bed, it will greatly promote their taking root; but in May they must be inured to the open air by degrees, into which they should be soon after removed. Thus these plants should be managed while young; but when they are three or four years old, some of them may be planted in the full ground against a warm wall or pale, where, if they have a dry soil, they will endure the cold of our ordinary winters pretty well, but must be sheltered in hard frosts; so that it will be prudent to reserve a few plants housed during winter.

45. Rhamnus Spina Christi; *Syrian Christ's Thorn.* Prickles in pairs, straight; leaves ovate, acute, toothed, smooth; fruits oblong, pedicelled, eatable, and pleasant.—In all probability, says Hasselquist, this is the tree which afforded the crown of thorns put on our Saviour's head. It seems very fit for the purpose, for it has many sharp thorns, well adapted to give pain. The crown might be easily made of these round pliant branches; and as the leaves much resemble those of Ivy, it is probable that our Lord's enemies would prefer this plant, for resembling that with which emperors and generals used to be crowned.—Native of Palestine, Ethiopia, and Barbary.

Rhapis; a genus, according to Linnæus, of the class Polygamia, order Monœcia; Thunberg places it in the class Hexandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth minute, rigid, inferior, one-leafed, trifid. *Corolla:* one-petalled, trifid, larger than the calix; segments erect, concave, deciduous. *Stamina:* filamenta six, awl-shaped; antheræ roundish, two-lobed. *Pistil:* germen superior, three-lobed; style short, awl-shaped; stigma obtuse. *Pericarp:* berry roundish-ovate. *Seed:* solitary, roundish, bony. *Observe.* The flowers are often polygamous or dicœcious. ESSENTIAL CHARACTER. *Calix:* trifid. *Corolla:* one-petalled, trifid. *Stamina:* six. *Pistil:* one.——The species are,

1. Rhapis Flabelliformis; *Creeping-rooted Rhapis,* or *Ground Rattan.* Fronds palmate, plaited; plaits and margins prickly toothletted; stem arboreous, lofty. Besoms are made of the thin netted-bark of the trunk. It flowers in August.—Native of China and Japan.

2. Rhapis Arundinacea; *Simple-leaved Rhapis.* Fronds two-parted; lobes acute, plaited; plaits somewhat rugged.—Native of Carolina.

Rheedia; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* none. *Corolla:* petals four, obovate, concave, spreading. *Stamina:* filamenta very many, filiform, longer than the corolla; antheræ oblong. *Pistil:* germen globular; style cylindrical, the length of the stamina; stigma funnel-form. *Pericarp:* small, ovate, succulent, one-celled. *Seeds:* three, ovate-oblong, marked with characters, very large. ESSENTIAL CHARACTER. *Calix:* none. *Corolla:* four-petalled. *Berry:* three-seeded.——The only species is,

1. Rheedia Lateriflora. Leaves opposite, lanceolate, quite entire, smooth.—A tree, native of South America.

Rheum; a genus of the class Enneandria, order Monogynia.—GENERIC CHARACTER. *Corolla:* perianth inferior, one-leafed, narrowed at the base, with a six-cleft border; the segments blunt, alternately small, shrivelling. *Stamina:* filamenta nine, capillary, inserted into the corolla, and of the same length with it; antheræ twin, oblong, blunt. *Pistil:* germen short, three-sided; styles scarcely any; stigmas three, reflexed, feathered. *Pericarp:* none. *Seed:* single, large, three-sided, acute, with membranaceous margins. ESSENTIAL CHARACTER. *Calix:* six-cleft, permanent. *Seed:* one, three-sided.——The species are,

1. Rheum Rhapontîcum; *Rhapontic Rhubarb.* Leaves blunt, smooth; veins somewhat hairy underneath; the sinus at the base dilated; petioles grooved above, and rounded at the edge. Root large and thick, dividing into many strong fleshy fangs, running deep in the ground, reddish-brown outside, yellow within; stems from two to three feet high, jointed, purple; leaves not expanded at first, but folded, smooth, roundish-cordate, on thick, reddish, channelled stalks, which have an acid flavour, and used for making pies and tarts; flowers white, becoming a panicle of large, triangular, brown seeds. This species is now commonly cultivated in gardens for the sake of the footstalks of the leaves, which are peeled and made into tarts in the spring. The root is the part made use of in medicine, and is much of the same nature with that of the true Rhubarb, only it is less purgative and more astringent: if it is wanted to purge, the dose must be two or three drachms; but though it is weaker in this respect, it is a much better stomachic than the true Rhubarb.—Native of Syria. All the plants of this genus are propagated by seeds, which should be sown in autumn soon after they are ripe, where the plants are designed to remain. When the plants appear in spring, let the ground be hoed over, to cut up the weeds; and if the seedlings themselves be too close, some should be cut up, leaving them at the first hoeing six or eight inches asunder, at the second eighteen inches or more. As soon as any weeds appear, scuffle the ground over with a Dutch hoe in dry weather; and as soon as the plants cover the ground with their broad leaves, they will keep down the weeds of themselves. In autumn, when the leaves decay, clean the ground, and in the spring, before the plants begin to put up their new leaves, dig the ground between, or at least hoe and clean them. In the second year, many of the strongest plants will produce flowers and seeds; but in the third year, most of them will flower and seed; and the seed ought not to be permitted to scatter, but should be gathered when ripe. The roots will remain many years without decaying. These plants delight in a rich soil, which is not too dry or moist.

2. Rheum Undulatum; *Wave-leaved Rhubarb.* Leaves subvillose, waved; the sinus at the base dilated; petioles flat above, acute at the edge. The root divides into a number of thick fibres, which run deeper into the ground than those of the first species, and are of a deeper yellow colour within.—Native of China and Siberia.

3. Rheum Palmatum; *Officinal,* or *Turkey Rhubarb.* Leaves palmate, acuminate, somewhat rugged; the sinus at the base dilated; petioles obscurely grooved above, rounded at the edge. Root perennial, thick, of an oval shape, and sends off long tapering branches; externally it is brown, internally of a deep yellow colour; stem erect, round, hollow, jointed, sheathed, slightly scored, branched towards the top, from six to eight feet high. This species cannot be mistaken, if we attend to its superior height, the ferruginous or reddish-brown colour of the stem, branches, and petioles, the palmate form of the leaves, and the elegant looseness of the little panicles of greenish-white flowers. Linnæus adds, that the vernal bud is not red, but yellow; that the leaves are somewhat rugged; and that their segments are oblong and sharpish.—Native of China and Tartary. It was not until the year 1732 that botanists knew any species of Rheum from which the true Rhubarb seemed likely to be obtained. Nor was this species at first very generally received as the genuine plant, until Boerhaave procured from a Tartarian Rhubarb-merchant the seeds of the plants which produced the roots he annually sold, and which were admitted at St. Petersburgh to be the real Rhubarb. These seeds, on being sown, produced two distinct species: the first species, above described;

and this, or the officinal plant. On this account, some are of opinion that the true drug is obtained from several species. The Society for the Encouragement of Arts, Manufactures, and Commerce, has exerted itself for many years in promoting the cultivation of Rhubarb, and with considerable success. The growth of this plant is remarkably quick: a plant six years old grew between the month of April, when the stalk first emerged out of the ground, and the middle of July, when it was in its greatest height, to eleven feet four inches. It grew in one day above three inches, and above four inches in a single night. Many of the leaves were above five feet long. The root, taken up in October, weighed thirty-six pounds, when clean washed, and deprived of its small fibres. It appears, however, upon the whole, that English Rhubarb is inferior to the foreign; though it is possible that this inferiority may be owing only to the circumstances which industry and attention might remedy; and that this might be done in a great measure, by attending to the age of the plant when taken up, to the root being cut transversely, rasped on the outside, having the sappy parts cut out, being also dried quickly, and kept some time before brought into use. The foreign Rhubarb may acquire some advantage from soil, climate, culture, and the mode of drying, but probably much more from its superior age; for Bergius asserts, that it is not taken up till it is six years old.—The following are some of the rather contradictory results of comparative experiments upon the Turkey, East Indian, and English Rhubarbs. The tincture from the Turkey sort tasted rather more aromatic than the rest, and seemed to possess a somewhat higher degree of astringency than the East Indian, which also exceeded the tinctures made from English specimens in the same quality. From one experiment, it appears that the East Indian kind is the weakest purgative, although that is the drug generally used in making the tincture sold in the shops. Two experiments prove that the English Rhubarb possesses the purgative power in a superior degree. From another experiment, it appears that forty-five grains of Turkey Rhubarb contains the purgative quality nearly equal to sixty of the English; that is, the latter requires to be given to the amount of one-fourth more, to produce the same effect. This account, which may be found in Vol. iii. of the *Bath Papers*, coincides in effect with the result of former experiments; but later comparisons prove that English Rhubarb approaches nearer in proportion to its age. On the whole, there seems much reason to believe that by perseverance we may be enabled not only to supply a sufficient quantity of the genuine drug, properly cured for home consumption, but also for foreign markets. It is objected, that we must wait at least four years, or, as some think, six or seven, before the roots become fit for use; but it is important to know the fact, that it may be administered with success when younger, in its fresh state, (that is, undried,) by bruising half an ounce of the root, and boiling it in half a pint of water till it is reduced to one quarter of a pint. The superseding the present necessity of importing this drug from abroad, is a consideration of no small importance at all times, but especially when we consider the scarcity which we felt whenever the ports of Russia and Turkey were unexpectedly closed against us. The purgative qualities of Rhubarb are extracted more perfectly by water than by spirit: the root remaining after the action of water is almost, if not wholly inactive; whereas, after repeated digestion in spirit, it still proves very considerably purgative. The quality of the watery infusion, on being inspissated by a gentle heat, is so much diminished, that a drachm of the extract is said scarcely to have more effect than a scruple of the root in substance: the spirituous tincture loses less; half a drachm of this extract proving moderately purgative. The purgative quality of this root is so gentle, that it is often inconvenient on account of the quantity necessary for a dose, which in adults must be from half a drachm to one drachm. When given in a large dose it will occasion some gripings, as other purgatives do; but it is hardly ever heating to the system, or produces the effects of more drastic purges. Its purgative quality is accompanied by a bitterness, which is often useful in restoring the tone of the stomach; for the most part, this bitterness makes it sit better on the stomach than many other purgatives. Its operation joins well with neutral laxatives, and both together operate in a less dose than either of them would do singly. Some degree of stypticity is always evident in this medicine; and as this quality acts when that of the purgative has ceased, in cases of diarrhœa, when any evacuation is proper, Rhubarb has been considered as the most proper means to be employed. The use of it in substance, for keeping the belly regular, is by no means proper, the astringent quality undoing what the purgative had done; unless it be chewed in the mouth, and no more swallowed than what the saliva has dissolved. Analogous to this, is the use of Rhubarb in a solution; for in that, the astringent quality is not so largely extracted as to operate with a power equal to that employed in substance. The officinal preparations from this drug are, a watery and vinous infusion, and a simple and compound tincture. The Rhubarb which is of a bright or light texture, moist, fragrant, and sound, should be made choice of, as being milder in its operation, more grateful to the stomach, and more likely to answer the purpose of an astringent, a diuretic, or an alterative. In acute fevers, when there is danger to be apprehended from the use of other purging medicines, Rhubarb is safe. In the bloody flux, and those loosenesses which are occasioned by acrid matter lodged in the intestines, this root is doubly useful—first, by evacuating and carrying off the offending matter; and, secondly, by strengthening the parts, and preventing a further afflux. It likewise possesses the peculiar excellency of evacuating viscid bile, when lodged in the biliary ducts or passages; in which cases it is the best among purging medicines, Aloes excepted; and it has this advantage over them, that it may be given when inflammation is attendant, provided bleeding is first premised. The spirituous and vinous tincture of it, kept in the shops, are generally used as strengtheners or purgatives: for the first of these purposes, two or three spoonfuls is a sufficient dose at a time; but for the latter, two or three ounces is frequently necessary. This root may probably be useful, not only as a medicine, but a dye, as may appear from the following trial. Infuse a portion of the root in water; and to the infusion, when strained, add a few grains of salt of tartar: this will produce a very beautiful red tincture, such as would be valuable for the purposes of dyeing a colour, which probably might be amply provided for by the general cultivation of this root. Not only the root, but other parts of the plant, are useful. At Versailles, the recent stem is converted into a marmalade, which is considered as a mild, pleasant, and highly salubrious laxative. They prepare it by stripping off the bark, and boiling the pulp with an equal quantity of honey or sugar. The leaves are also used by the French in their soups, to which they impart an agreeable acidity like that of Sorrel. The seeds possess the same medicinal property with the root, in an eminent degree. From the trials of Dr. Fothergill of Bath, it appears that twelve grains of the seeds operate on some persons nearly as much as twenty in others of the same age. On some they act gently, on others roughly; such is the difference of constitution. In

general it appears, that twenty grains of the seeds are equal to thirty of the root, as to the purgative power: that the residuum of the seeds is nearly equal in this respect to their powder, according with what has been discovered concerning the residuum of the root; but that the proof spirit extracted less from the seeds than from the root, by way of tincture. The seeds appeared to be more aromatic than the root, but to contain less astringency than even its residuum, when treated in the same manner. A selenetic salt has been discovered to be a constituent principle in Rhubarb, among other astringent vegetables; and it has been pronounced a combination of the acid of Wood-sorrel with a calcareous earth. Some writers affirm, that the distilled water of this plant contains a purgative quality; but this needs confirmation. The chemical and medicinal properties of the residuum; the elastic fluid extricated by distillation; the essential salt, already mentioned; and the astringent principle; may all deserve the attention of a curious observer, and may throw new light on the medicinal qualities of this important drug.—Dr. Pulteney remarks, that if this species and the first be planted near each other, they produce a hybrid variety, more valuable than the parent plants.—*Propagation and Culture.* It appears to be the general opinion, that the same soil which is fit for Carrots will suit Rhubarb. It may be doubted whether manure should or should not be used; the prevailing notion seems to be that dung injures the quality of the root, and that it will be best on good sound land well worked. Dr. Mounsey directs the seeds to be sown in April or May, three or four in a pot, which should be plunged in a hot-bed until they vegetate. When the plants are about two months old, transplant them where they are to remain in a fine light soil. Keep some of them in pots until October, and some till the spring following, and then plant them out. When by these precautions you have secured a sufficient number of plants, the seeds may be sown in the open air: if they vegetate late in the season, cover them with mulch or moss, to preserve them in winter. When they are transplanted, set the plants at least four feet asunder; hoe them, keep them clean, and turn up the ground yearly between the rows, taking care not to touch the roots. In the second or third year the plants will begin to bear seeds. The earliest period at which the roots are useful, is at four years' growth, but even then they will be soft and spongy; so that if they remain eight years or more undisturbed, it will add greatly to their perfection. The seeds, however, do not require a hot-bed to make them vegetate; but if sown in the natural ground during the spring, when the weather is open, will soon come up, and thrive very fast. The plant delights in a moist, rich, light, deep soil, and warm exposure, but will thrive in almost any soil or situation. If the roots be covered with litter, or the earth be drawn over them in winter, they will rise the stronger in the following spring. The nursery-bed must be diligently attended to, as the whole difficulty consists in bringing the plants through their first season: if the weather be hot and sultry, they must be shaded, and at all events continually watered. The pains bestowed by constant waterings, and protecting the young plants from the ravages of insects, will amply repay the planter. Roots that thrive well here, will in three years overtake others, that have not succeeded so well at the end of five. When a plantation is to be formed, or a vacancy filled up, select the finest and most thrifty plants; and remember that no plant will come to any thing, if it have lost its principal bud. When a plantation does not possess the natural advantage of being on a declivity, narrower beds and deepened trenches are among the best means to be adopted: but most situations will require some care to prevent the bad effects of water remaining on the crowns of the plants; therefore when the seed-stalks are cut off, which ought always to be done immediately upon the withering of the radical leaves, they should be covered with mould in the form of a hillock. This process will answer two good purposes; that of throwing off the rain, and keeping the trenches open by taking the earth from them.—Till the plants have blown, the medical qualities of the roots scarcely come into existence; and at the same period the danger of delay also commences. When the buds from the roots have grown up and flowered, a cavity is formed in the centre of the plant, in which rain will make a lodgment, to the inevitable destruction of those parts which remain unprotected. Those portions of the crown, out of which the seed-stalks rise, always prove most valuable. Every spring and autumn the plants should undergo a general examination. The young ones will presently discover their real situation; for either their leaves will wither as fast as they are produced, or their growth will become stunted: but with regard to the older ones, or those that have blown, as in most cases there will be discovered enough sound root to produce a luxuriant foliage, their state can only be discovered by pressing a finger into the centre of the crown; which will soon detect any unsoundness. In both cases the plants should be removed, and the vacancies filled with others; for in the former case much time will be saved, and the bad situation of the latter by remaining will only be aggravated, whilst it furnishes the cultivator with an opportunity of discovering the cause of such defects, which may possibly lead him to the means of prevention. Rhubarb may be propagated from offsets, as well as from seeds. A gentleman who was disappointed in raising plants from seed, separated some of the eyes or buds which shoot out on the upper part of the root, together with a small part of the root itself, having some of the fibres attached; which succeeded. These offsets may be taken from roots of three or four years old, without injuring the plant. By this method a year is saved; and these offsets are not in such danger of being devoured by vermin as those from seed, nor so uncertain in growing; these are beside not so tender, and do not require transplanting, nor any thing but weeding: there is said to be no difference in the size of the roots thus raised. There is a great difference of opinion among those who have written upon this subject, as to the age at which the Rhubarb roots ought to be taken up for use: some say at four, five, six, seven, and some at eleven or twelve years' growth. As to the season for taking them up, as the late Dr. Lettsom observes, it may be of little consequence, as to the vigour of the roots, whether they be taken up in summer or autumn, but, as warm weather is the best for drying them, the former seems most eligible. Sir William Fordyce directs, that as soon as the root is dug up, it should be washed thoroughly clean, the fibres taken away, and not a particle of bark left on the larger roots. Cut these into pieces seven inches square, as nearly as they will admit of, and an inch and a half thick. Make a hole in the middle of each, about half an inch square, and string them on a packthread, with a knot on each, at such a distance as to keep them from rubbing or entangling. Thus secured, hang them up in festoons in the warm air of a kitchen, laundry, or stove, till the superfluous moisture is exhaled, to prevent their becoming mouldy or musty. They may be afterwards dried more at leisure, and, when quite dry, may be wrapped separately in cotton, and kept in wide-mouthed bottles. The tap-roots and parings will make excellent tinctures. In Tartary, the mode of drying is as follows: The root being completely cleansed, and the smaller branches cut off, is cut transversely into pieces of a

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RHEXIA CILIOSA.

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RHEUM COMPACTUM,
Thick-leaved Rhubarb.

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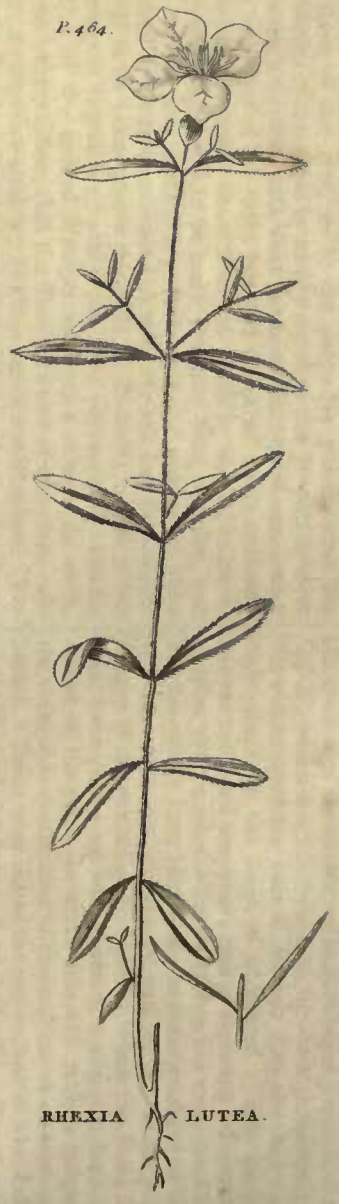

RHEXIA LUTEA.

D. W. Campbell sc.

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moderate size; these are placed on long tables or boards, and turned three or four times a day, that the yellow viscid juice may incorporate with the substance of the root: for if it be suffered to run out, the root becomes light and unserviceable; and if they be not cut within five or six days after they are dug up, the roots become soft, and speedily decay. Four or five days after they are cut, holes are made through them, and they are exposed to the air and wind, but sheltered from the sun. Thus in about two months the roots are completely dried, and arrive at their full perfection. The loss of weight in drying is very considerable, seven loads of green roots yielding only one small horse-load of perfectly dry Rhubarb. Dr. Falconer thinks, that if the following circumstances were attended to, British Rhubarb might equal any of the foreign. First, a selection of the best pieces is absolutely necessary. Secondly, the central part of every piece should be cut out; for it is found by experience that this, perhaps from its proximity to the sap, is moistest and most subject to decay; and when any part comes into this state, the infection soon spreads, and damages the whole piece. Doubtless it is to avoid this, that the pieces of Russian Rhubarb have all holes of a considerable size cut through their centre, which answers this more material purpose, as well as that of hanging them up to dry; and the English, having only the latter end in view, seldom make the holes large enough to answer the former, at least not sufficiently large to admit of removing the spongy and decaying parts. Thirdly, the outside should be scraped, or rather rasped, as the foreign Rhubarbs are: the neglect of this not only gives it a shrivelled and mean appearance and colour, but is really a great disservice, by obstructing the quickness of drying, from the pores not being laid open for the herbaceous moisture to exhale. Though the bark be stripped off, the larger pores, running mostly longitudinally, do not open laterally, and of course the watery fluid, being confined, exudes very slowly. Fourthly, it is probable that a great improvement might be made in the preparation of our Rhubarb, by accelerating its drying. It was formerly thought that plants were best dried in a slow and gradual manner, which is now found to be a mistake; and that quick drying equally consists with the safety of the vegetable substance, and the perfection of its efficacious qualities.

4. Rheum Compactum; *Thick-leaved Rhubarb.* Leaves sublobed, extremely blunt, very smooth, shining and toothletted. Roots large, divided into many fangs, yellow within. They approach nearer to the foreign Rhubarb than any other, both in shape and quality.—Native of Tartary. It is propagated in the same way as the first species, which see.

5. Rheum Ribes; *Warted-leaved Rhubarb.* Leaves very blunt, somewhat wartletted, with spinulose veins underneath; petioles flat above, rounded at the edge. Roots thick, fleshy, running deeply into the ground.—Found on mounts Libanus, Antilibanus, Sinai, and Carmel.

6. Rheum Tataricum; *Tartarian Rhubarb.* Leaves cordate-ovate, entire, very smooth; petioles half round, angular; panicle grooved.—Native of Lesser Tartary.

7. Rheum Hybridum; *Bastard Rhubarb.* Leaves smooth above, somewhat hairy underneath, sublobed, acute; sinus narrowed at the base; petioles obscurely grooved above, rounded at the edge.—Native of the north of Asia.

Rhexia; a genus of the class Octandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, tubular, vetricose at the bottom, oblong, with a four-cleft border, permanent. *Corolla:* petals four, roundish, inserted into the calix, spreading. *Stamina:* filamenta eight, filiform, longer than the calix, and inserted into it; antheræ declining, grooved, linear, blunt, versatile. *Pistil:* germen roundish; style simple, the length of the stamina, declining; stigma thickish, oblong. *Pericarp:* capsule roundish, four-celled, four-valved, within the belly of the calix. *Seed:* numerous, roundish. Essential Character. *Calix:* four-cleft. *Petals:* four, inserted into the calix. *Antheræ:* declining. *Capsule:* four-celled, within the belly of the calix.——The species are,

1. Rhexia Virginica. Leaves sessile, lanceolate, three-ribbed, serrate; calices fringed with glands. This rises with an erect stalk nearly a foot and half high, four-cornered, and hairy. The stalk has two peduncles coming out from the side opposite to each other at the upper joints, and is terminated by two others; these each sustain two or three red flowers with heart-shaped petals, spreading open in the form of a cross: they appear in June.—It is a native of North America. This, and the next species, are propagated by seeds, which must be procured from the places where they naturally grow. If the seeds arrive before the spring, and be sown soon after in pots filled with good fresh earth, and placed under a frame to guard them from frost, the plants will come up in the following spring; but if the seeds are not sown till that time they seldom appear in the first year. When they are fit to remove, plant part of them in an eastern border, and others in pots to be sheltered under a frame in winter. The second year the plants will flower, and may be continued with care for three or four years.

2. Rhexia Mariana. Leaves sessile, lanceolate, three-ribbed, fringed with soft hairs; hairs of the calix stellated. This sends up an erect stalk about ten inches high. The stalk divides at top into two peduncles, spreading from each other, having one or two reddish flowers on each, with a single subsessile flower between them.—Native of Maryland, of Brazil, and Surinam.

3. Rhexia Trichotoma. Flowers solitary, axillary, and terminating; leaves sessile, opposite, lanceolate, hirsute; stem frutescent.—This and all the following species, coming from the hotter parts of America, will require tender treatment to be cultivated here.

4. Rhexia Acisanthera. Flowers alternate, axillary, peduncled, five-cleft; stem firm and square, emitting many square branches towards the top.—Native of Jamaica.

5. Rhexia Jussioides. Leaves alternate, ribbed, rugged at the margin.—This is a shrub, four feet high, found at Surinam.

6. Rhexia Glutinosa. Leaves opposite, three-nerved, even; flowers thyrsoid; stem shrubby. A handsome plant, destitute of pubescence; but the calix and upper part of the leaves extremely glutinous; flowers copious, large, purple.—Found by Mutis in New Granada.

7. Rhexia Leucantha. Leaves opposite, cartilaginous-toothletted, coriaceous, shining; branchlets four-cornered; flowers terminating, ten-stamined.—Native of Jamaica.

8. Rhexia Purpurea. Leaves opposite, toothletted, coriaceous; branchlets round; flowers axillary, ten-stamined.—Native of Jamaica.

9. Rhexia Uniflora. Leaves petioled, ovate, serrate; flowers axillary, solitary, ten-stamined; stem dichotomous. —Found at Cayenne.

10. Rhexia Inconstans. Leaves ovate, hispid with close-pressed bristles, hoary, three-nerved; peduncles terminating, one or two flowered; calix rough, with spreading bristles. This is a small low shrub, with diffused ascending branches. Flowers purple, usually five-cleft. Ryan remarks, that it varies much in the number of stamina.—He found it in Montserrat, upon lava covered with Moss.

11. Rhexia Bivalvis. Smooth, ten-stamined: leaves oblong, sessile, obscurely crenate, blunt; peduncles terminating, one-flowered. This is an annual plant, smooth all over, and of an ash-colour.—Native of Guiana.

12. Rhexia Trivalvis. Smooth, ten-stamined; leaves linear, lanceolate, sessile, dotted above, quite entire; peduncles one-flowered. Annual.—Native of Guiana.

13. Rhexia Longifolia. Hairy, ten-stamined: leaves lanceolate, quite entire, five-nerved; peduncles axillary and terminating, dichotomous, shorter than the leaves. Stems herbaceous, loose, angular, of a yellowish ash-colour, owing to long dense hairs pressed close to the surface.—Native of South America.

14. Rhexia Ciliosa. Stem subquadrangular, glabrous; leaves small, subpetiolate, oval, glabrous underneath, slightly hispid on the upper part, distinctly ciliated at the margin; flowers subsolitary, involucrate, large, of a beautiful purple colour; antheræ very short.—Grows on the bogs of Lower Carolina, and flowers in July and August.

15. Rhexia Glabella. Plant with a glabrous cylindraceous stem; leaves sessile, erect, lanceolate, smooth, glabrous, very finely denticulated; calix glutinous; flowers the largest of the North American sorts.—Grows in the sandy moist woods of Carolina and Georgia. There is a variety with deep purple flowers, called by Walton, *Rhexia Alifanus.*

16. Rhexia Stricta. Stem very straight, alate-tetragonal, partially glabrous; leaves sessile, erect, narrow-lanceolate, attenuate-acuminate, three-nerved, glabrous on both sides; corymb dichotomous; calix slightly glabrous; flowers very handsome, purple.—Grows in the bogs of Lower Carolina and Georgia.

17. Rhexia Lutea. Stem quadrangular, rough; leaves with a few roughnesses; lower ones cuneate-oblong, obtuse; upper ones lanceolate; antheræ very short; flowers small, yellow.—Grows in the Pine woods of Georgia and Florida.

18. Rhexia Linearifolia. Stem cylindrical, subpubescent; leaves alternate, linear, oblong, obtuse, sessile, pubescent; flowers subsolitary, yellow.—Native of Carolina.

Rhinanthus; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, roundish, inflated, compressed, four-cleft, permanent. *Corolla:* one-petalled, ringent; tube subcylindrical, the length of the calix; border gaping, compressed at the base; upper lip galeate, compressed, emarginate, narrower; lower lip spreading a little, flat, half three-cleft, blunt, the middle segment widest. *Stamina:* filamenta four, about the length of the upper lip, under which the two shorter ones lie concealed; antheræ incumbent, bifid on one side, hirsute. *Pistil:* germen ovate, compressed; style filiform, in the same situation with, but longer than the stamina; stigma blunt, bent in. *Pericarp:* capsule blunt, erect, compressed, two-celled, two-valved, opening at the edges; partition contrary. *Seeds:* several, compressed. *Observe.* The second species has the margin of the capsule blunt, the seeds simple, the calix unequal, two-lipped. The margin of the capsule in the third species is augmented, the seeds membranaceous, clothed with wool, and the calix equal, four-cleft. Essential Character. *Calix:* four-cleft, ventricose *Capsule:* two-celled, blunt, compressed.—The plants of this genus do not thrive under culture, and are very difficult to keep in gardens. Being annual, they can only be propagated by seeds, which should be sown soon after they are ripe wherever they are intended to remain, as they will not bear removing. They require a moist rich soil, and a shady situation. When the plants come up, thin them, and keep them clear from weeds. If the seeds be permitted to scatter, the plants will come up better than when sown by hand; but they thrive best among grass.——The species are,

1. Rhinanthus Orientalis. The corollas with the upper lip awl-shaped, and curved in; stems a foot and a half high, hollow, four-cornered, hairy. The flowers on the upper part of the stem yellow, with a brown spot on the lower lip, and two red ones on the upper: they have an agreeable scent.—Tournefort, who found this plant on the confines of Persia, flowering in July, speaks of it as one of the most beautiful in the East.

2. Rhinanthus Elephas. The corollas with the upper lip awl-shaped, straight.—Native of Italy and Siberia, in shady places, flowering in May.

3. Rhinanthus Crista Galli; *Yellow Rattle,* or *Cock's Comb.* Upper lip of the corolla arched; calix smooth; leaves lanceolate, serrate. Root annual, small, with few fibres; stem branched, smooth, frequently spotted; flowers not always strictly opposite, on short peduncles, yellow. It flowers early in June, and is common in pastures; and is called Yellow Rattle from the noise made by the ripe seeds in the calix. It is known in some counties by the name of Penny Grass, and in Yorkshire by that of Henpenny, from the size and shape of the seed-vessel, like a silver penny. Its other appellation, of Cock's Comb, is derived from the appearance of the upper leaves or bractes which accompany the flowers. Horses, sheep, and goats, are said to eat it, and cattle to refuse it; though others say, that all quadrupeds reject it except when in the stall or stable, or given dried as hay. The growth of this plant is remarkably quick, and is supposed in some foreign countries to be very injurious to the crop of Rye. It is a troublesome weed among grass, insomuch that in many water meadows there is more of this plant than of herbage. The seed ripening by the time these meadows are commonly mowed, the seeds scatter, and fill the ground with young plants in the following spring. In order to destroy it, the grass among which it grows ought to be cut as soon as the flowers appear; and those who purchase Grass seeds should be careful that none of this seed be mixed with it.

4. Rhinanthus Trixago. Calices hirsute, tomentose; leaves opposite, bluntly serrate; stem quite simple; root annual, throwing out runners; flowers in large yellow spikes.—Native of Italy, the south of France, and Palestine.

5. Rhinanthus Capensis. Calices tomentose; bractes ovate; leaves lanceolate, toothed.—Native of the Cape.

6. Rhinanthus Trifida. Corollas spreading at the throat; leaves trifid. Root annual; stem upright, quite simple, six inches high, herbaceous.—Native of sandy hills in Armenia and Galatia.

7. Rhinanthus Indica. Leaves sublanceolate, hairy, quite entire.—Native of Ceylon.

8. Rhinanthus Virginicus. Corolla spreading at the throat; leaves sinuated and toothed; anthers rough with hairs.—Native of Virginia.

Rhizobolus; a genus of the class Polyandria, order Tetragynia.—Generic Character. *Calix:* perianth one-leafed, fleshy, tomentose, half five-cleft; segments roundish, concave. *Corolla:* petals five, ovate, rounded, concave, fleshy, inserted below the divisions of the calix, and much larger than it. *Stamina:* filamenta very numerous, filiform, longer than the corolla, inserted into the receptacle; antheræ roundish. *Pistil:* germen superior, four-cornered, at the bottom of the calix; styles four, filiform, longer than the corolla; stigmas blunt. *Pericarp:* drupes four, kidney-shaped, compressed, inserted by the internal wedge-form margin into a conical receptacle, one-celled, with a fleshy rind, and a buttery soft pulp. *Seeds:* nuts solitary, kid-

ney-shaped, with a brittle shell covered with prickles; kernels solitary, kidney-shaped. ESSENTIAL CHARACTER. *Calix:* half five-cleft. *Petals:* five. *Germen:* four-sided, superior. *Nuts:* four, one-celled, one-seeded.——The species are,

1. Rhizobolus Butyrosus. With fingered leaves, smooth on both sides. This is a tall tree, the trunk of which is three feet in diameter. The bark is grey; and the wood reddish and compact. The flowers grow in large bunches at the extremities of the branches, and are of a white colour, appearing in July; fruit yellowish.—Native of Guiana.

2. Rhizobolus Tuberculosus. With fingered leaves, downy beneath. This tree has thicker leaves than the preceding, downy beneath, and ash-coloured. Fruit larger, and tubercled, the pulp dry, not buttery: the nut is sweet and palatable, containing a rich oil; and is not unfrequent in fruiterers' shops, by the name of Suwarrow Nut.—Native of Guiana.

Rhizophora; a genus of the class Dodecandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, four-parted or many-parted, patulous; segments oblong, acuminate, permanent. *Corolla:* petals four or more, oblong, rather shorter than the calix. *Stamina:* filamenta scarcely any, alternately shorter; antheræ four to twelve, small, acuminate. *Pistil:* germen superior, roundish; style awl-shaped, semibifid, grooved on each side; stigmas acute. *Pericarp:* fleshy, subovate, enclosing only the base of the seed. *Seed:* single, club-oblong, acuminate, fleshy at the base. *Observe.* The stamina differ in number, as do the calix and corolla. ESSENTIAL CHARACTER. *Calix:* four or five parted. *Corolla:* four or five parted. *Seed:* one, very long, fleshy at the base.——The species are,

1. Rhizophora Conjugata. Leaves ovate-oblong, bluntish, quite entire; calices sessile; fruits cylindric-subulate. This, like all the rest of this genus, is a maritime tree.—Native of the East Indies.

2. Rhizophora Gymnorhiza. Leaves lanceolate, quite entire; root placed upon the ground. This tree is above the middle size, with a lofty straight trunk: the bark is thick, cloven, of a brown-red colour; and is very useful in dyeing a rufous or chestnut colour, which is easily changed into a very fine permanent black.—There are vast quantities of this tree on the shores of Cambodia and Cochin-china; and our circumnavigators found it in the islands of the South Seas.

3. Rhizophora Candel. Leaves obtuse; peduncles bigeminate, longer than the leaf; fruits awl-shaped. The flowers have a weak, but not unpleasant smell.—Native of the East Indies, in shallow salt-water.

4. Rhizophora Mangle; *Mangrove Tree.* Leaves acute; fruits subulate-clavate. This tree generally rises to the height of fifty feet: the wood is white, but becomes red when macerated in water; the bark is thick, and rust-coloured. Flowers white, mostly eight-petalled. It is generally found on the borders of the sea, in the waters of which (alone) it seems to thrive. Its larger branches frequently send out soft and weakly appendicles, that have the appearance of so many slender leafless branches, and bend always downwards; but as these are softer, and furnished each with a large column of lax spongy pith in the centre, they grow more luxuriantly than the other parts of the tree, and reach the mud in a short time, where they throw out a numberless series of slender fibres, which in time become roots to supply the stem more copiously with nourishment, whilst they become so many props or limbs to the parent tree. Thus it continues to enlarge its bulk, as its branches spread; these constantly throw out new appendicles as they multiply their shoots, and form those interwoven groves we so frequently meet with on the sea-shore in tropical climates; which serve to stop the mould that is constantly washed down by the rapid floods that come from the inland parts, and thereby in time turn what might have continued useless ponds or open creeks into rich and fertile fields. The quantity of mosquitoes that frequent these maritime forests make it impossible for an European to live, or even to pass a night, near them: they are inhabited also by innumerable sea-birds and crabs; and the matted roots enable the savages to walk about the ooze and shallow waters to hunt for them. The trunk seldom grows to any considerable thickness, but the wood is very tough and hard, bears the water well, and is much used for knees and ribs in long-boats, and other small craft, for which the arches and angles of its limbs most naturally adapt it. The bark is most excellent for tanning leather; it performs this operation more perfectly in six weeks, than Oak-bark will do in ten, and the leather tanned with it is the most firm and durable of any for soles. The decoction of the bark is a most powerful astringent.—This tree is a native of both the East and West Indies, of the Society and Friendly Islands, the New Hebrides and New Caledonia, in the South Seas.

5. Rhizophora Cylindrica. Fruits cylindrical, blunt. This agrees with the second species, except that it is rather taller, and not divided into so many trunks. Flowers white, axillary. The fruit is eaten when young and tender: it is green when young, but afterwards reddish-blue.—Native of salt marshes in Malabar.

Rhodiola; a genus of the class Dicœcia, order Octandria.—GENERIC CHARACTER. *Male. Calix:* perianth four-parted, concave, erect, obtuse, permanent. *Corolla:* petals four, oblong, obtuse, from erect spreading, double the length of the calix, deciduous; nectaries four, erect, emarginate, shorter than the calix. *Stamina:* filamenta eight, awl-shaped, longer than the corolla; antheræ simple. *Pistil:* germina four, oblong, acuminate; styles and stigmas obsolete. *Pericarp:* abortive. *Female. Calix:* perianth as in the male. *Corolla:* petals four, rude, erect, obtuse, equal with the calix, permanent; nectaries as in the male. *Pistil:* germina four, oblong, acuminate, ending in simple straight styles; stigmas obtuse. *Pericarp:* capsules four-horned, opening inwards. *Seeds:* very many, roundish. *Observe.* Dahl having observed hermaphrodite flowers with ten stamina and five styles, is of opinion this genus should be associated with *Sedum.* ESSENTIAL CHARACTER. *Male. Calix:* four-parted. *Corolla:* four-petalled. *Nectaries:* four. *Female. Calix* and *Nectaries:* like the male, but smaller. *Petals:* of a coarse texture. *Capsules:* four, many-seeded.——The species are,

1. Rhodiola Rosea; *Common* or *Yellow Roscwort.* Leaves ovate, serrate towards the top. Stem upright; root thick and fleshy, sending out, when bruised or cut, an odour like roses; the flowers are yellowish and herbaceous, appearing early in May: they have a very agreeable scent; but are not of long continuance. The root is sweetest when dried, in which state a fragrant water may be distilled from it; but when cultivated in a garden, it loses most of its odour. Goats and sheep are said to eat the plant, but cattle and swine refuse it. The inhabitants of the Faro Islands use it as a remedy for the scurvy; and the Greenlanders eat it as garden-stuff. A cataplasm of the fresh roots, applied to the forehead, is said to relieve the headache; also to cure malignant ulcers. There is a variety which flowers later.—Native of Lapland, Denmark, and Norway, Great Britain, Austria, Silesia, Switzerland, Dauphiny, Piedmont, and Siberia, on the mountains of those countries. In England it occurs only in the northern counties of Westmoreland, Cumberland, and

Yorkshire; also in Scotland and Wales.—To propagate it, plant cuttings of the stalks in the middle of April, soon after they come out from the head, in a shady border; covering them close down with a glass, and keeping them dry: they will put out roots in six weeks, but the cuttings should be laid in a dry room at least a week before they are planted, otherwise they are subject to rot. Or, part the roots in the beginning of September, when their stalks begin to decay; and if the fleshy parts are cut or broken, lay them to dry a few days before they are planted. They require a shady situation, and a dry undunged soil, in which they will continue many years.

2. Rhodiola Biternata. Leaves biternate, gashed; stem twining.—Native of Cochin-china, in ill-cultivated gardens, but not frequent. The female has not been seen.

Rhododendrum; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, permanent. *Corolla:* one-petalled; wheel-funnel-form; border spreading, with five rounded unequal segments. *Stamina:* filamenta ten, filiform, almost the length of the corolla, declined; antheræ oval. *Pistil:* germen five-cornered, retuse; style filiform, the length of the corolla; stigma obtuse. *Pericarp:* capsule ovate, subangular, five-celled, divisible into five parts. *Seeds:* numerous, very small. Essential Character. *Calix:* five-parted. *Corolla:* somewhat funnel-form. *Stamina:* declined. *Capsule:* five-celled. ——The species are,

1. Rhododendrum Ferrugineum; *Rusty-leaved Rhododendrum.* Leaves smooth, leprous underneath; corollas funnel-shaped; clusters terminal; calix fringed. It rises with a shrubby stalk nearly three feet high, sending out many irregular branches, covered with a purplish bark. The flowers are produced in round bunches at the ends of the branches; the corolla is funnel-shaped, with a short tube, and is cut into five obtuse segments at the brim, spreading a little open, and is of a rich crimson colour, dotted with white.—Native of high mountains in Switzerland, Austria, Savoy, Piedmont, and Dauphiny; where this, and the fourth species, terminate the ligneous vegetation as we ascend, and furnish the shepherds with their only fuel. The grouse are said to eat it, and the white hares sometimes gnaw the bark in hard weather; yet animals do not appear to feed on it, except in want of other food, and it is suspected of being in a small degree poisonous. The galls of some small insect are frequently upon it. The flowers appear from May to July, but are seldom produced in abundance upon cultivated plants.—All the plants of this genus are propagated by seeds: but they are so very small, that if they are covered deep they will not grow. They should be sown as soon as possible after they are ripe, either in a shady border, or in pots filled with fresh loam, and very lightly covered with a little fine earth. Plunge these pots up to their rims in a shady border, and in hard frost cover them with bell and hand glasses, taking them off in mild weather. If these seeds be sown early in autumn, they will come up in the following spring. They must be kept shaded from the sun, especially the first summer, and duly refreshed with water; in the autumn following transplant them to a shady situation and on a loamy soil, covering the ground about their roots with moss, to guard them from frost in winter, and keep the ground moist in summer. They may also be increased from suckers or offsets, which they produce plentifully where they naturally grow, though they rarely produce them in England, nor do the seeds often come to maturity in our climate.

2. Rhododendrum Dauricum; *Dotted-leaved Rhododendrum.* Leaves smooth, dotted, naked; corollas wheel-shaped. Root tuberous, knobbed, thick, deeply bound down by rootlets striking into the ground, or into the fissures of rocks; trunks very short above ground, twisted, and knobbed: the flowers come out before the leaves, at the ends of the branchlets of the former year, from a bud that continues the branch, composed of ferruginous, subpubescent, concave scales; they nod a little, and have some smell.—Native of Siberia: it is peculiar to the subalpine tracts of Eastern Asia. It appears first at the jaws of the river Jenisca; and beyond that, especially from the river Uda, in the Pine woods, it begins to be common; but about Baikal it is most abundant, and extends through the desert of the Mongols to China and Tibet; at the Lena it becomes more rare; and beyond that, is much lower, with a more slender flower, and narrower leaves. See the preceding species, for its propagation and culture.

3. Rhododendrum Chrysanthemum; *Yellow Rhododendrum.* Leaves oblong, undotted above, rugged, and very much veined; corolla wheel-shaped, irregular; flowering-bud ferruginous, tomentose. In alpine situations this shrub is less than a foot high; in lower grounds it grows to a foot and half, sending out abundance of decumbent branches, having their ends emerging from the moss, subdivided, bearing both leaves and flowers.—Native of the highest mountains of Siberia, &c. See the first species for its propagation and culture.—This plant was first noticed for its medicinal qualities by Gmelin and Steller, who mention it as used in Siberia for the cure of rheumatism. Little attention, however, was paid to it, till Kœlpin recommended it in 1779, not only in rheumatism and gout, but even in venereal cases; and it is now generally employed in chronic rheumatism, in various parts of Europe. The leaves, which are the parts employed, have a bitterish subastringent taste, and, as well as the bark and young branches, manifest a degree of acrimony. Taken in large doses, they prove a narcotic poison. Dr. Home, who tried this shrub unsuccessfully in cases of acute rheumatism, says, that it appears to be one of the most powerful sedatives which we have, as in most trials it reduced the pulse remarkably low, and in one patient reduced it thirty-eight beats. In other cases, at Edinburgh, it has been productive of such good offects, as to obtain admission into their Pharmacopeia. The method of using the plant by the Siberians is, by putting two drachms of the dried leaves in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night: thus they take it in the morning, and by repeating it three or four times, generally effect a cure. It is said to occasion heat, thirst, a degree of delirium, and a peculiar sensation of the parts affected. This medicine should be taken with caution, and the patient should begin with small doses, increasing them gradually; but it is not likely ever to become a favourite medicine in this country, because it is not an indigenous plant.

4. Rhododendrum Hirsutum; *Hairy Rhododendrum.* Leaves ciliate, naked; corollas funnel-shaped. This shrub seldom rises two feet high, and sends out many short woody branches, covered with a light brown bark. It greatly resembles the first species, the chief distinction consisting in the leaves being fringed with rigid hairs, their form more obovate and flat; and their under side less rusty. It has been tried, and found to possess the same medicinal properties as the preceding species.—Native of the mountains of Switzerland, Austria, Styria, and Dauphiny.

5. Rhododendrum Chamæcistus; *Dwarf Rhododendrum.* Leaves ciliate; corollas wheel-shaped. This is a small shrub, very much branched, the extreme branches leafy; corolla purple, the segments ovate.—Native of Austria, Carniola, Monte-Baldo, and near Saltzburg.

6. Rhododendrum Ponticum; *Purple Rhododendrum.* Leaves lanceolate, shining, smooth on both sides; racemes terminating; segments of the calix oval, obtuse; corolla bell-shaped, spreading. Trunk upright, shrubby, commonly the height of a man, but sometimes only half so high, frequently thicker than the human arm, very much branched from the bottom irregularly; the wood white, the bark ash-coloured. Tournefort remarks, that the flowers of this plant were reputed to impart a noxious quality to honey. It flowers in May and June.—Native of the Levant and Gibraltar; also of Georgia, and in the southern subalpine tracts of Caucasus, where it affects wet places in Beech and Alder coppices, on rocky mountains, but not on high alps. Common in the European gardens, where it blossoms beautifully in the open ground in June, but by forcing in a pot, much earlier. Male varieties may be obtained, and some of them with deciduous leaves, between this plant and the *Azaleas.*

7. Rhododendrum Caucasicum. Leaves ovate rugged, bent in at the edge; umbels terminating; bractes elongated. Root creeping among Moss, thick, woody; trunk arborescent, eighteen inches high, diffused and procumbent, scarred, ascending at the end, and there leafy and flowering.—Native of the higher rocks of Caucasus, near the perpetual ice.

8. Rhododendrum Kamtschaticum. Leaves ciliate, nerved; corollas wheel-shaped; calices leafy. This is a very elegant undershrub; root woody, dry, the size of a quill, creeping by prostrate runners of a brown testaceous colour. The partial peduncles have one or two lanceolate leaflets and a nodding flower, of a rose-colour.—It was first discovered by Steller; and grows abundantly in the peninsula of Kamtschatka and Behring's Island, in muddy places on the mountains. It begins to flower at the end of July, and ripens its seeds towards the end of September.

9. Rhododendrum Maximum; *Broad-leaved Rhododendrum.* Leaves oval, shining, blunt, veined, with an acute reflex margin; pedunceles one-flowered. In its native soil it grows fifteen or sixteen feet high, with a shrubby stalk, sending out a few branches towards the top.—Native of North America, upon rocks and in barren soils, where it continues flowering great part of the summer, and is a great ornament to the barren rocks.

10. Rhododendrum Catawbiense. Leaves short-oval, rotundate obtuse, glabrous, discoloured; umbels terminal; segments of the calix elongate-oblong; corolla campanulate, scarlet.—Grows on the high mountains of Virginia and Carolina, particularly on the head-waters of the Catawba river, and flowers in May and June.

Rhodora; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-toothed, permanent. *Corolla:* petals three, unequal; the two lowermost lanceolate equal; the upper one wedge-shaped, ascending, three-lobed, the middle lobe rather longest. *Stamina:* filamenta ten, filiform, declined, the length of the corolla; antheræ roundisn, twin. *Pistil:* germen ovate, furrowed; style filiform, declined, a little longer than the stamina; stigma five-cleft, thickish. *Pericarp:* capsule ovate, five-celled. *Seeds:* very many, minute. Essential Character. *Calix:* five-toothed. *Petals:* three, unequal. *Stamina:* declined. *Capsule:* five-celled.——The only species yet known is,

1. Rhodora Canadensis; *Canadian Rose-blossom.* Stem upright, somewhat branched, round, ash-coloured, two feet high; leaves deciduous, alternate, stalked, veiny, hairy; flowers appearing before the leaves, in umbels on short pedicels, purple, the upper lip with darker spots. It is chiefly distinguished from the Rhododendrum by its three-petalled corolla; and appears to be generally distinct from them, especially in the herb.—Native of Newfoundland. It is difficult to raise it from seeds; but may be propagated by slips or cuttings, and thrives best in a good sandy loam.

Rhubarb. See *Rheum.*

Rhubarb, Monk's. See *Rumex Alpinus.*

Rhus; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth five-parted, inferior, erect, permanent. *Corolla:* petals five, ovate, from upright spreading. *Stamina:* filamenta five, very short; antheræ small, shorter than the corolla. *Pistil:* germen superior, roundish, the size of the corolla; styles scarcely any; stigmas three, cordate, small. *Pericarp:* berry roundish, one-celled. *Seeds:* one, roundish, bony. Essential Character. *Calix:* five-parted. *Petals:* five. *Berry:* one-seeded.—*Observe.* This genus consists of trees and shrubs: the flowers are in panicles or close racemes, in some hermaphrodite, in others male and female on separate plants; in the two last polygamous, having males mixed with the hermaphrodites. From this distinction of the sexes Mr. Miller has divided the genus into, *Rhus* having hermaphrodite flowers, and *Toxicodendron* having diœcous flowers. ——The species are,

* *With pinnate Leaves.*

1. Rhus Coriaria; *Elm-leaved Sumach.* Leaves pinnate; leaflets elliptic, bluntly toothed, villose underneath. Stem woody, strong, dividing into many irregular branches, and rises to the height of eight or ten feet; the bark is hairy, and of an herbaceous brown colour whilst young. The branches are used instead of Oak-bark for tanning leather; and it is said that all Turkey leather is tanned with this shrub. The leaves and seeds are used in medicine, and are esteemed very restringent and styptic. The Tripoli merchants sell the seeds at Aleppo, where they are in common use at meals to provoke an appetite.—Native of the south of France, Spain, Italy, the Levant, and Africa. Frequent in our gardens and shrubberies, flowering in July, and retaining its dense, branched, ample, upright clusters of deep-red, rough, coriaceous berries, till winter, after the leaves have fallen. The taste of the fruit is very acid and astringent.—*Propagation and Culture.* The first, second, fourth, fifth, and ninth species, are hardy plants, and will thrive in the open air in England; but the first and fifth not being quite so hardy as the others, must have a better situation, otherwise their branches will be injured by severe frost in the winter. They are easily propagated by seeds obtained from the countries where they grow; if these be sown in autumn, the plants will come up the following spring; but if sown in the spring, they seldom come up till the next spring: they may be either sown in pots, or the full ground. If they are sown in pots in autumn, the pots ought to be placed under a common frame in winter, where the seeds may be protected from hard frost, and if in the spring the pots are plunged into a very moderate hot-bed, the plants will soon rise, and thereby have more time to get strength before winter. When the plants come up, they must have a large share of air, and should be gradually hardened to bear the open air, into which they must be removed as soon as the weather is favourable, placing them where they may have the morning sun, and keeping them clean from weeds; in dry weather, a good supply of water will promote their growth, which should be stinted towards autumn by keeping them dry, that the extremity of their shoots may harden; for if they are replete with moisture, the early frosts in autumn will pinch them, and sometimes cause the shoots to decay almost to the bottom, where the plants are fully exposed. If the pots are put under a common frame again in autumn,

it will secure them from injury, for while they are young, and the upper part of the shoots is soft, they will be in danger of suffering in very severe winters; but in mild weather must always enjoy the open air, and should therefore never be covered but in frost. The spring following, just before the plants begin to shoot, they should be shaken out of the pots, and carefully separated, so as not to tear the roots, and then transplanted into a nursery, in rows three feet asunder, and about one foot distance in the rows. In this nursery they may stand two years to get strength, and then may be transplanted where they are to remain. The seeds which are sown in the full ground, may be covered the first winter with some old tanner's bark, to keep out the frost; and in the spring it may be drawn off again after the danger of the hard frost is over; and when the plants come up, they must be kept clean from weeds, which is all the care they will require the first summer: but as the plants in the full ground are apt to grow luxuriant, and continue growing late in autumn, they should be covered, to screen them from the early frost, which will otherwise kill their tops, and this often occasions them to die down a considerable length, and frequently almost to the ground in hard winters. In the spring following, the plants may be taken up carefully, and transplanted into a nursery, at the same distance as before directed. This method of propagating the plants from seeds is seldom practised after the plants are once obtained; for they are very subject to send up a great number of suckers from their roots, whereby they are easily propagated. The suckers of all the sorts may be taken up and planted in the nursery for a year or two to get strength, and then may be planted where they are to remain. These shrubs are generally planted in plantations of flowering shrubs in large gardens, where they make a fine variety in autumn, especially the second, fourth, and fifth sorts, with their large purple or red panicles, which have a good effect; but where these are planted, their suckers must be every year taken off, otherwise they will grow up to a thicket, and destroy the neighbouring plants.

2. Rhus Typhium; *Virginian Sumach.* Leaves pinnate; leaflets lanceolate, acuminate, sharply tomentose underneath. This has a woody stem, from which are sent out many irregular branches, generally crooked and deformed. The flowers are produced in close tufts at the ends of the branches in July, and are followed by seeds enclosed in purple woolly succulent covers, so that the branches are of a beautiful purple colour in autumn. This shrub, as well as the preceding, is used for tanning leather; and the roots are prescribed in medicine where it grows naturally, that is, in almost every part of North America. See the preceding species.

3. Rhus Javanicum; *Java Sumach.* Leaves pinnate, ovate, acuminate, serrate, tomentose underneath. This is a large tree, with spreading branches.—Native of China and Japan, where it flowers in September. The Chinese extract an oil from the berries, by bruising and boiling them in water; this they use as a varnish.

4. Rhus Glabrum; *Scarlet Sumach.* Leaves pinnate, lanceolate, serrate, naked on both sides; flowers hermaphrodite. This is not so high as the Common Virginian Sumach; but the branches are much more spreading and smooth. —Native of North America, in woods, high glades, and old corn-fields. It is like a weed in some parts of the country; and if a field be left a few years uncultivated, this shrub overruns it, from berries which are brought by birds; and when the ground comes again into tillage, the roots stop the plough very much. The fruit remains on the shrub during winter, but the leaves drop very early in the autumn. It seldom grows above three yards high; and the wood burns well, without much crackling. On cutting the stem, a yellow juice comes out between the bark and the wood; one or two of the outer circles are white, but the innermost are of a yellowish green: it contains a pith, half an inch in diameter or more, of a brown colour, and so loose that it is easily pushed out by a stick. The branches, boiled with the berries, afford a black ink-like tincture. The berries, though very sour, are eaten by children with impunity; they are red, and are used to dye that colour.—There are many varieties of this species in North America, but not worth specifying here. See the first species.

5. Rhus Elegans; *Carolina Sumach.* Leaves pinnate, lanceolate, serrate, naked on both sides; flowers diœcous. This generally rises to the height of seven or eight feet.—Native of South Carolina. See the first species.

6. Rhus Vernix; *Varnish Sumach.* Leaves pinnate, very smooth, as well as the branches; leaflets elliptical, entire, somewhat abrupt, pointed; clusters compound, lax; flowers diœcous; fruit polished. This is undoubtedly Kæmpfer's *Sitz*, or True Varnish Tree, with a walnut leaf, and a fruit in a raceme-like cicer. The dried specimens also, brought from Japan, agree with the American Poison Tree; and the milky juice of both have the same quality of staining a dark brown. Where it grows naturally, it rises with a strong woody stalk to the height of twenty feet or more, but seldom exceeds five or six in England. The trunk is covered with a light brown bark inclining to gray. The whole shrub is in a high degree poisonous, and the poison is communicated by touching or smelling any part of it; in forty-eight hours afterwards, inflammation and large blotches will appear on the skin, principally on the extremities and on the glandulous parts of the body. Small pustules rise soon afterwards in the inflamed parts, and fill with watery matter, occasioning burning and itching. In two or three days the eruptions suppurate; after which the inflammation subsides, and the ulcers heal in a short time. It operates, however, somewhat differently in different constitutions, and some are incapable of being poisoned at all, while irritable persons appear most affected. Kalm gives the same account of his experiment upon one of the trees. An incision being made, a whitish yellow juice, which had a nauseous smell, came out between the bark and the wood; this, though noxious to some persons, did not in the least affect others. On Kalm it had no effect, except once on a hot day, when, being in some perspiration, he cut a branch, and carried it in his hand for half an hour, smelling at it now and then. It produced a violent itching on his eyelids and the adjoining parts: during a week his eyes were very red, and the eyelids stiff, but the disorder went off by washing the parts in very cold water. Thunberg asserts, that the very best Japan varnish is made from this tree, which grows in great abundance in many parts of that country, and is likewise cultivated in several places on account of the great advantages derived from it. This varnish, which oozes out of the tree on its being wounded, is procured from stems that are three years old, and is received in some proper vessel. When first caught, it is of a lightish colour, and of the consistence of cream, but grows thicker and black on being exposed to the air. It is so transparent, that when laid, pure and unmixed, upon boxes or furniture, every vein of the wood may be clearly seen. For the most part a dark ground is spread under, which causes it to reflect like a mirror; and for this purpose, recourse is frequently had to the fine sludge which is caught in the trough under a grindstone, or to ground charcoal; occasionally a red substance is mixed with the varnish, and sometimes leaf-gold ground very fine. This varnish hardens very much, but will not endure any blows, cracking and fly-

ing almost like glass, though it can stand boiling water without receiving any damage. With this the Japanese varnish over the posts of their doors and windows, their drawers, chests, boxes, cimeters, fans, tea-cups, soup-dishes, their portable stools, and most articles of household furniture which are made of wood. It far exceeds the Chinese and Siamese varnish, and the best sort of it is collected about the town of Jassino. It is cleared from impurities by wringing it through very fine thin paper; then about a hundredth part of an oil called Foi, which is expressed from the fruit of Bignonia Tomentosa, is added to it, and being put into wooden vessels, either alone or mixed with native Cinnabar, or some black substance, it is sold all over Japan. The expressed oil of the seed serves for candles.—*Propagation and Culture.* This species, and the seventeenth, eighteenth, nineteenth, and twentieth, propagate in plenty by their creeping stalk and roots, or by laying down their branches, which will put out roots in one year, and may then be taken off and transplanted, either in the places where they are to remain, or in a nursery, to grow two or three years, to get strength before they are planted for good: they are also propagated by seeds, which should be sown on a bed of light earth, and when the plants come up, they must be kept clear from weeds the following summer; and before the frost comes on in autumn, the bed should be hooped, that the plants may be covered with mats, for otherwise the early frosts will kill their tops, which frequently causes their stalks to decay to the ground; for as the plants are slender, and generally shoot late the first year, they are in much greater danger than when they get more strength. In spring they may be transplanted into the nursery beds to grow a year or two, and after that may be finally transplanted. The juice of the wood is poisonous to animals in confined places.

7. Rhus Succedaneum; *Red Lac Sumach.* Leaves pinnate, quite entire, perennial, shining; petioles entire, equal. This is allied to the preceding, but is certainly distinct, particularly in the size of the leaves. It flowers in June.—Native of Japan and China. The oil of the seeds, expressed whilst warm, acquires the consistence of suet, and serves for making candles. The trunk yields a varnish, but in so small a quantity as not to be worth collecting. The true Chinese Varnish or Lacker Tree is called *Sat Shu*, and not *U Tong Shu.* In collecting the varnish, they make an incision in the bark, and insert a tube for the juice to run into a little pot, which is taken every morning before sun-rise.

8. Rhus Semialatum; *Half-winged Sumach.* Leaves pinnate, serrate; petioles on the outmost internodes, membranaceous.—Native of China, near Macao.

9. Rhus Copallinum; *Lentiscus-leaved Sumach.* Leaves pinnate, quite entire; petiole membranaceous, jointed. This seldom rises more than four or five feet high.—Native of North America. See the first species.

10. Rhus Alatum: *Winged Sumach.* Leaves pinnate; leaflets ovate, serrate at the end; petioles on all the internodes, winged.—Native of the Cape of Good Hope. This, and all the rest of the African species, being too tender to live throughout the winter in the open air in England, are planted in pots or tubs, and housed in autumn: and during the winter they must be treated in the same way as other hardy greenhouse plants. They retain all their leaves through the year, and make a good variety when intermixed with other plants in the greenhouse in winter. They may be propagated by cuttings, which should be planted in pots filled with loamy earth at the beginning of April, and plunged into a very moderate hot-bed, covering them close with hand or bell glasses, and screening them from the sun in the heat of the day. The cuttings should be moderately refreshed with water. With this management they will put out roots in about two months, and when they begin to shoot they should have air admitted to them, and be gradually hardened to bear the open air, into which they must be removed, placing them in a sheltered situation; and when the cuttings have filled the pots with their roots, they should be taken out of the pots and parted carefully, planting each into a separate small pot, placing them in the shade till they have taken new root, when they may be intermixed with other exotic plants in a sheltered situation for the summer, and in autumn removed into the greenhouse.

11. Rhus Pauciflorum; *Few-flowered Sumach.* Leaves pinnate; leaflets alternate, decurrent, wedge-shaped, serrate at the end; panicle sessile, few-flowered.—Native of the Cape. See the preceding species.

12. Rhus Metopium; *Hog Gum Tree.* Leaves pinnate, quinate, quite entire, roundish, smooth. This tree seldom rises to more than twenty-five or thirty-five feet, and is very spreading towards the top. It yields a great quantity of a gummy resin, which when pure is of a yellow colour, and after a short time acquires a hard brittle consistence. It is daily used in strengthening plasters, for which it is deservedly recommended. It is of a warm discutient nature, and may be used in all swellings arising from colds, &c. both externally and internally. The gum, dissolved in water, is an easy purgative, and thought to be an extraordinary diuretic. In Jamaica it is frequent enough, and the hogs are said to have recourse to it when wounded in the woods. —Native of America.

13. Rhus Digitatum; *Finger-leaved Sumach.* Scandent: leaves pinnate; leaflets oblong, quite entire, very smooth.—Native of the Cape. See the tenth species.

14. Rhus Pentaphyllum; *Five-leaved Sumach.* Thorny; leaves digitate; leaflets linear-lanceolate, wider upwards, blunt, toothed, or entire at the end. This tree is very much branched, and has stout floriferous thorns: the bark is gray, dyes red, and is fit for tanning leather.—Native of Barbary, on uncultivated hills near Arzeau.

15. Rhus Viridifolium. Plant slightly glabrous; leaves numerously pinnate; leaflets lanceolate-oblong, serrate, subtomentose; racemes erect, herbaceous; flowers yellowish-green.—Grows on the edges of woods, in dry sunny situations, in Pennsylvania and Virginia. Pursh thinks it probable that this plant is merely a variety of Rhus Glabrum.

16. Rhus Pumilum. Plant low; branches and petioles pubescent; leaves numerously pinnate; folioles oval, incisodentate, tomentose underneath; fruits clothed with velvet down.—Grows in Upper Carolina, and is never seen above a foot high. This plant is the most poisonous of the genus, according to Mr. J. Lyon, who, by collecting the seed of this species, got poisoned all over his body, and was lamed for a considerable time.

** *With ternate Leaves.*

17. Rhus Cirrhifolium. Scandent: leaves ternate; leaflets quite entire, smooth.—Native of the Cape.

18. Rhus Tridentatum. Scandent: leaves ternate; leaflets hoary, serrate; serratures three to five.—Native of the Cape.

19. Rhus Radicans; *Rooting Poison-oak* or *Sumach.* Leaves ternate; leaflets petioled, ovate, naked, quite entire; stem rooting. This has a low shrubby stalk, which seldom rises more than three feet high, sending out shoots near the bottom, which trail upon the ground, putting out roots from their joints, whereby it multiplies and spreads greatly. If it be near a wall, the fibres will strike into the joints, and support the stalks when severed from the root. When it is thus

supported, the stalks become more woody, and it rises much higher than when it trails on the ground. Having, in common with Ivy, the quality of not rising without the support of a wall, tree, or hedge, it is called in some parts of America *Creeping Ivy*. When the stem is cut, it emits a pale brown sap of a disagreeable scent, and so sharp that letters or marks made upon linen with it cannot be got out again, but grow blacker the more it is washed. Like the sixth species, it is poisonous to some persons, but in a less degree. Kalm relates, that of two sisters, one could manage the tree without being affected by its venom, whilst the other felt its exhalations as soon as she came within a yard of it, or even, when she stood to windward of it, at a greater distance; that it had not the least effect upon him, though he had made many experiments upon himself, and once the juice squirted into his eye; but, that on another person's hand, which he had covered very thick with it, the skin a few hours after became as hard as a piece of tanned leather, and peeled off afterwards in scales. There is a variety with a straight and stout trunk, having a brownish ash-coloured bark; the leaves smooth, veined, bright green above, paler underneath, pendulous, and somewhat bent back.—For the propagation of this and the two following, see the sixth species.

20. Rhus Toxicodendron; *Trailing Poison-oak* or *Sumach.* Leaves ternate; leaflets petioled, angular, pubescent; stem rooting.—Native of many parts of North America.

21. Rhus Aromaticum; *Aromatic Sumach.* Leaves ternate; leaflets sessile, ovate-rhombed, gash-serrate, somewhat hairy. It flowers in May.—Native of Carolina.

22. Rhus Suaveolens; *Sweet Sumach.* Leaves ternate; leaflets sessile, wedge-rhombed, gash-serrate, smooth. It flowers in May.—Native of North America.

23. Rhus Dentatum; *Toothed Sumach.* Leaves ternate; leaflets obovate, mucronate-toothed, smooth; stem rugged.—Native of the Cape. See the tenth species.

24. Rhus Sinuatum; *Sinuate-leaved Sumach.* Leaves ternate; leaflets ovate, blunt, sinuate, villose underneath.—Native of the Cape. See the tenth species.

25. Rhus Cuneifolium; *Wedge-leaved Sumach.* Leaves ternate; leaflets sessile, wedge-shaped, very smooth, seven-toothed; teeth mucronate.—Native of the Cape.

26. Rhus Incisum; *Gash-leaved Sumach.* Leaves ternate; leaflets sessile, wedge-shaped, gash-pinnatifid underneath, tomentose, veined; calices tomentose.—Native of the Cape.

27. Rhus Tomentosum; *Woolly-leaved Sumach.* Leaves ternate; leaflets subpetioled, rhombed, angular, white and tomentose underneath. This rises with a woody stalk to the height of seven or eight feet, covered with a brown bark, and having many irregular branches; the flowers come out in slender bunches from the side of the branches; they are of a whitish herbaceous colour, and soon fall away.—Native of the Cape. See the tenth species.

28. Rhus Villosum; *Hairy-leaved Sumach.* Leaves ternate; leaflets obovate, quite entire, sessile, hairy on both sides. This has a strong woody stalk, covered with a gray bark, with many smooth branches on every side.—Native of the Cape. See the tenth species.

29. Rhus Pubescens; *Hairy-branched Sumach.* Leaves ternate; leaflets obovate, mucronate, smooth; branches villose.—Native of the Cape.

30. Rhus Viminale; *Willow-leaved Sumach.* Leaves ternate; leaflets linear-lanceolate, quite entire, smooth, attenuated at the base, the middle one subpetioled.—Native of the Cape. See the tenth species.

31. Rhus Angustifolium; *Narrow-leaved Sumach.* Leaves ternate; leaflets petioled, linear-lanceolate, quite entire, tomentose underneath. It rises with a woody stalk seven or eight feet high, dividing into several irregular branches, covered with a dark-brown bark.—Native of the Cape. See the tenth species.

32. Rhus Rosmarinifolium; *Rosemary-leaved Sumach.* Leaves ternate; leaflets sessile, linear, revolute, ferruginous underneath.—Native of the Cape. See the tenth species.

33. Rhus Lævigatum; *Smooth-leaved Sumach.* Leaves ternate; leaflets sessile, lanceolate, even.—Native of the Cape.

34. Rhus Lucidum; *Shining-leaved Sumach.* Leaves ternate; leaflets sessile, wedge-shaped, even.—Native of the Cape. See the tenth species.

**** With Simple Leaves.*

35. Rhus Cotinus; *Venice Sumach.* Leaves simple, obovate or orbicular. Stem irregular, shrubby, rising to the height of six or eight feet, sending out many spreading branches covered with a smooth brown bark; flowers greenish, small, in terminal compound panicles; fruit gibbous. The root is used for dyeing; the leaves and young branches for black; and the bark for tanning leather.—Native of Austria, Switzerland, Italy, and Greece, in hilly situations. This is propagated by layers in autumn; by the autumn following, these will have taken root, when they may be taken off, and transplanted into a nursery; there let them grow a year or two to acquire strength, and then plant them out where they are to remain. It is so hardy a shrub as not to be injured by the frost of our winters, and is principally cultivated in our plantations for the very singular and ornamental appearance of its elongated feathery fruitstalks.

36. Rhus Atrum. Leaves simple, ovate-oblong; flowers polygamous.—Native of New Caledonia.

Ribes: a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, half five-cleft, ventricose; segments oblong, concave, coloured, reflex, permanent. *Corolla:* petals five, small, obtuse, erect, growing to the margin of the calix. *Stamina:* filamenta five, subulate, erect, inserted into the rim of the calix; antheræ incumbent, compressed, opening at the margin. *Pistil:* germen roundish, inferior; style bifid; stigmas obtuse. *Pericarp:* berry globular, umbilicated, one-celled; receptacles two, lateral, opposite, longitudinal. *Seeds:* very many, roundish, somewhat compressed. Essential Character. *Calix:* superior, tubular, five-cleft. *Petals:* five, inserted, with the stamina, into the calix. *Style:* bifid. *Berry:* many-seeded, inferior.——The species are,

** Unarmed:* Ribesia or Currants.

1. Ribes Rubrum; *Common Currant.* Racemes smooth, nodding; flowers flattish; petals obcordate; leaves obtusely five-lobed; stem erect; branches smooth.—Native of Europe, chiefly in the hedges and woods of the northern parts, flowering in May. It grows wild in the northern parts of England, as in Yorkshire, Durham, and Westmoreland, on the banks of the Tees, also in Scotland, as in the Isle of Isla; but in most parts of Great Britain it occurs only in hedges accidentally. It has been long cultivated in our gardens, and greatly improved. It is very apt to be infested with the *Apis ribes*, in which case the green leaves become red, pitted, and puckered. At present we have the following varieties: The common sort, with small red fruit: the same, with white fruit; another with pale fruit, commonly called the Champaign Currant, differing only in being of a pale red or flesh colour; the taste is the same, but the colour makes a variety for the table. But since the White and Red Dutch Currants have been introduced, and become common, many of the old sorts have been almost banished from our English gardens. A variety with blotched leaves is kept in

some plantations; but as this peculiarity is apt to go off when the plant is vigorous, it scarcely deserves notice.—The fruit is generally acceptable, either as nature presents it, or made into a jelly. If equal weights of picked currants and pure sugar are put over the fire, the liquor that separates spontaneously, is a most agreeable jelly. The juice is a pleasant acid in punch; and, mixed with sugar, is a common beverage at Paris, where it is generally preferred to orgeat or lemonade. The medicinal qualities appear to be similar to those of other subacid fruits, which are esteemed to be moderately refrigerant, antiseptic, attenuant, and aperient. They may be used with considerable advantage to allay thirst in most febrile complaints; to lessen an increased secretion of bile; and to correct a putrid and scorbutic state of the fluids, especially in sanguine temperaments; but in constitutions of a contrary kind, they are apt to occasion flatulency and indigestion.—*Propagation and Culture.* All the species of this well known genus are propagated either by suckers taken from old plants, by layers, by seed, or by cuttings; the last of which is the best, because plants produced from suckers are always more disposed to shoot out a great number of suckers from their roots, than such as are raised from cuttings, which generally form much better roots. The best season for planting these cuttings is in autumn, just before their leaves begin to fall; observing always to take the handsomest shoots, and from such branches as generally produce the greatest quantity of fruit. If you take those produced from the stem of the old plants, which are commonly very luxuriant, they will not be near so fruitful as those taken from bearing branches. These cuttings should be from six or eight, to ten or twelve inches long, and must be planted in a border of light earth, exposed to the morning sun, about three inches deep; observing to water them gently when the weather proves dry, to facilitate their taking root. In the summer, when they have put out branches, rub off all the undershoots, leaving only the uppermost or strongest, which should be trained upright to form a regular stem. In the following October, these plants may be removed; at which time you should prepare an open spot of fresh earth, which should be well dug, and cleansed from all noxious weeds, roots, &c. and being levelled, proceed to take up your plants, trimming their roots, and cutting off all side-branches: then plant them at three feet distance row from row, and one foot asunder in the rows, observing to place some short sticks to the plants, in order to train their stems upright and regular. In this place they may remain one or two years, being careful to keep them clear from weeds, as also to trim off all lateral shoots which are produced below the head of the plant, so that the stem may be clear about a foot in height above the surface of the earth, which will be full enough; and as the branches are produced commonly very irregular on the head, you must cut out such of them as cross each other, or thin them where they are too close, whereby the head of the plant will be open, and capable of admitting the air freely into the middle, which is of great use to all kinds of fruits. After these plants have remained in the nursery one or two years at most, they will be fit to transplant to the places where they are designed to remain; for it is not so well to let them grow in the nurseries too large, which will occasion their roots to be woody, whereby the removing of them will not only hazard the growth of the plants, but such of them as may take very well will remain stinted for two or three years, before they will be able to recover the check. The soil in which these plants thrive to the greatest advantage is a rich light earth, though they will do very well upon middling soils which are not too strong or moist, and in all situations; but where the fruit is cultivated in order to procure it in the greatest perfection, they should never be planted in the shade of other trees, but in a free open exposure. The distance proper for planting them is eight feet row from row, and six feet asunder in the rows. The best season for transplanting them is in October, when their leaves begin to decay; observing, as was before directed, to prune their roots, &c. If raised by *seed*, it should be sown on a border where the mould is fine, either in the autumn or early in the spring, keeping the young plants, when they appear, free from weeds; afterwards to be planted out in nursery-rows. Under the bushes which have been covered for late fruit, plenty of self-sown plants may generally be found, which will answer all the purposes of sowing, and may be taken up, and planted where they are designed to remain —In *pruning* these shrubs, common gardeners are apt to make use of garden shears, observing only to cut the head round, as it is practised in evergreens, &c. whereby the branches become so much crowded, that what fruit is produced never grows to half the size it would do were the branches thinned and pruned according to rule. This should always be done with a pruning-knife, shortening the strong shoots to about ten inches, and cutting out all those which grow irregular, thinning the fruit-bearing branches where they are too thick, observing always to cut behind a leaf-bud. With this management, your fruit will be near twice as large as those which are produced upon such bushes as are not thus pruned, and the shrubs will continue in vigour much longer; but you must observe to keep the ground clear from weeds, and dig it at least once a year, bestowing a little rotten dung upon it once every other year, which will greatly improve the fruit. It is a common practice with the gardeners near London, who have great quantities of these bushes in order to supply the markets, to prune them soon after Michaelmas, and then to dig up the rows, and plant it with Coleworts for spring use, whereby their ground is employed all the winter, without prejudicing the bushes; and in hard winters these Coleworts often escape, when those which were planted in an open exposure are all destroyed; and these are generally pulled up for use in February or March, so that the ground is clear before the shrubs come out in the spring: which is a piece of husbandry well worth practising where ground is dear, or where persons are confined for room. Currants, while they remain in the nursery, must be pruned and trained for the purposes for which they are designed; that is, to clear the stems about one foot high, if for standards, but if they are to be set against walls or pales, they must be trained up flat: but the best method is to train them against low espaliers, in which manner they will take up much less room in a garden, and their fruit will be much fairer. For this purpose they should not be planted less than eight or ten feet distant, that their branches may be trained horizontally, which is of the greatest importance to their bearing. If planted against a south-east wall or pale, their fruit will ripen at least a fortnight or three weeks sooner than those in the open ground, and against a north wall or pale it will be still later: thus the fruit may be continued in use during six months, especially if those to the north be covered with mats. These plants produce their fruit upon the former year's wood, and also upon small snags which come out of the old wood; in pruning, therefore, these snags should be preserved, and the young shoots shortened in proportion to their strength; observing not to lay the shoots too close, and never to prune the snags to make them smooth.

2. Ribes Petræum; *Rock Currant.* Racemes somewhat hairy, erect, when fruiting pendulous; petals obtuse; bractes shorter than the flower-stalks; leaves acuminate, lobed, gash-

toothed; stem erect. Flowers elegant, relatively large, scattered on short pedicels, which have a still shorter bracte at their base; berries large, very deep red, extremely acid, not losing their acidity by culture; and full of juice, but less glutinous than the fifth species. It is distinguished from the sixth species by the flowers being in racemes; though Dr. Smith doubts whether it be distinct from that species.—Native of Carinthia, Styria, Silesia, Bohemia, and England, where it has been found near Egleston and Conscliff, in the county of Durham.

3. Ribes Procumbens; *Trailing Currant.* Racemes erect; flowers flattish; leaves obtusely lobed; stem procumbent; berries smooth, often larger than those of the Black Currant, hanging down from almost erect racemes, yellowish-green, or, when ripe, rufescent, very pleasant to the taste, and therefore esteemed in Dauria, where the shrub grows wild.

4. Ribes Glandulosum; *Glandulous Currant.* Racemes erect, with glandulous hairs; flowers flattish; leaves acuminate, lobed, toothed; berries hispid; stem ascending, rooting. It differs by its creeping branches and pedicelled glands on all the outer parts of the inflorescence; and from all the thornless species, in having hispid fruits.—Native of North America.

5. Ribes Alpinum; *Tasteless Mountain Currant.* Racemes erect; bractes longer than the flower; leaves shining underneath; stem erect; berries elliptic, red, mucilaginous, and insipid, or with a flat sweetish taste, agreeable only to children. The wood, being hard and tough, makes good teeth for rakes. It flowers in April and May.—Native of Europe and Asia, in woods, thickets, and hedges. It is found in the northern parts only of England: especially about Bradford, in Yorkshire; about Darlington, in Durham; and near Edgbaston and Ilam, in Staffordshire.

6. Ribes Spicatum; *Acid Mountain Currant.* Spikes erect; flowers nearly sessile; petals oblong; bractes shorter than the calix; berries like those of the Black Currant in colour and taste. Its upright spikes are sufficient to distinguish it from all its brethren.—Found in England, in the neighbourhood of Richmond in Yorkshire; and afterwards near the Tees, between Piersbridge and Gainsford in Durham.

7. Ribes Fragrans; *Fragrant Siberian Currant.* Racemes erect; corollas bell-shaped; leaves bluntly three-lobed; stem ascending. The flowers have a very strong smell; fruit, when largest, of the size of the Black Currant, red, and very sweet.—Native of Siberian mountains, bordering on Mongolia, where there is no wood.

8. Ribes Triste; *Dark-coloured Siberian Currant.* Racemes pendulous; corollas flattish; leaves five-lobed. From a creeping root, this species rises to two or three feet high, with several upright shoots. Berries small, black, insipid, full of a blackish-red juice, very excellent for colouring wines.—Native of Siberia, and the summits of the Jablennoi ridge.

9. Ribes Nigrum; *Common Black Currant.* Racemes loose, hairy, pendulous; peduncle simple at the base; flowers bell-shaped; bractes shorter than the pedicels; leaves five-lobed, acute, dotted underneath. This is distinguished by its more humble habit, its strong-smelling leaves, glandular underneath, its hairy racemes, tubular calix, and black fruit, but especially by its solitary one-flowered peduncle at the base of the raceme, and distinct from it: stamina sometimes more than five, and then there are fewer petals, so that when there are ten stamina, there are no petals; this change of the petals into stamina, is just the reverse of the process by which single flowers are known to become double; and this is the only instance in which this curious fact appears to have been observed. The berries have a very peculiar flavour, which many persons dislike; they are, however, common. eaten in puddings in some parts of England, and make a tart little inferior to the Cranberry. The juice is frequently boiled down to an extract, with the addition of a small proportion of sugar; in this state it is called *Rob*, and is much used for the same purpose as gargles, in inflammatory sore throats. The fruit has been called Squinancy or Quinsy Berries, from their efficacy in this way. The Black Currant jelly, in common domestic use, is rendered less efficacious for this purpose by having too much sugar in its preparation. Some put the berries into brandy, for the same purpose as Black Cherries. The Russians make wine of the berries alone, or fermented with honey, with or without spirits; or, they mix the expressed juice with spirit drawn from wheat. They make a drink also of the leaves, in Siberia. The leaves, when young, tinge common spirits so as to resemble brandy; an infusion of them is said to have the taste of green Tea, and is peculiarly agreeable to some palates. They have also been recommended for their medicinal virtues, as cleansing, pellent, and diuretic. An infusion of the young roots is useful in fevers of the eruptive kind, and in the dysenteric fevers of cattle. Goats eat the leaves, and bears are particularly fond of the berries. For its propagation, &c. see the first species.

10. Ribes Floridum; *American Black Currant.* Racemes pendulous; flowers cylindrical; bractes about as long as the germen; leaves three-lobed, cut, dotted on both sides. This agrees exactly with the preceding species in its form and manner of growth, but differs in having the racemes a long span in length, erect, not pendulous; and the leaves, bark, and berries, without any smell. The plants do not produce much fruit here, and are therefore only kept as curiosities.—Native of Pennsylvania, flowering in April and May.

11. Ribes Albinervium; *White-veined Currant.* Leaves abbreviated, acutely lobated, slightly glabrous; nerves hoary; racemes recurved; flowers small, greenish-yellow; berries red.—Grows, according to Michaux, on Lake Mistassins. It has also been observed growing on the Catkill mountains, North America.

12. Ribes Trifidum; *Notch-flowered Currant.* Leaves somewhat lobated, glabrous on the upper surface, pubescent underneath; racemes lax, pubescent; flowers greenish-yellow; petals purple; berries rough, red.—Grows in Canada, and on the Pennsylvania mountains.

13. Ribes Rigens; *Stiff-branched Currant.* Branches straight; leaves acutely lobated and dentated, reticulate-rugose, pubescent on the under side; racemes lax, rigescent-erect; berries slightly hispid, red, erect as well as the flowers.—Grows on Lake Mistassins, and on the Pennsylvania mountains.

14. Ribes Prostratum. Branches reclinate-prostrate; leaves lobated, slightly glabrous, the younger leaves pubescent; racemes subereet; petals deltoid; bractes minute; flowers yellow, tinged with red; berries hispid, red.—Grows in the rocky moist places of Newfoundland, Canada, and Pennsylvania.

15. Ribes Viscosissimum; *Glutinous Currant.* Plant covered over with hairs of a viscous nature; leaves cordate, obtusely trilobed, serrated; racemes erect, short; calix tubulate; petals oblong; bractes linear-spathulate, as short again as the pedicel; germina rough; flowers large, yellow.—Grows on the Rocky mountain, in the interior of North America.

16. Ribes Resinosum; *Resinous Currant.* Plant covered over with resinous-glandulous hairs; leaves from three to five lobed, subrotund; racemes erect; petals obtusely rhomboidal; bractes longer than the pedicel; berries rough; flowers green.—A North American plant.

17. Ribes Sanguineum; *Crimson-flowered Currant.* Leaves cordate, trilobed, serrate, venous-lineate, glabrous on the upper side; racemes lax, pubescent, as long again as the leaves; calix tubulated; petals oblong, of the length of the calix; bractes obovate, spathulate, of the length of the pedicels; germina rough; branches purple; flowers beautiful, of a blood-red or purple.—Grows on the Columbia river.

18. Ribes Aureum; *Golden-flowered Currant.* Plant very glabrous; leaves trilobed; lobes divaricate, inciso-dentate; racemes lax, densely multiflorous; calix tubulate, longer than the pedicels; tube slender; segments oblong, obtuse; petals linear, as short again as the segments of the calix; bractes linear, of the length of the pedicels; berries glabrous.—It grows on the banks of the rivers Missouri and Columbia. The flowers are of a beautiful golden yellow colour; the berries are red or brown, of an exquisitely fine taste, and considerably larger than any of our garden Currants.

19. Ribes Recurvatum. Branches recurvate; leaves widish, acutely lobate, pubescent, glandulous-pinnate; racemes reflex; calix tubulated, glabrous; berries black.—Grows near Hudson's Bay.

** *Prickly*: Grossulariæ, or Gooseberries.

20. Ribes Diacantha; *Two-spined Gooseberry.* Prickles in pairs, stipular; flowers in racemes; leaves wedge-form, three-parted, toothed; berries smooth. This is a kind of intermediate species between the Currants and Gooseberries: it has a pair of prickles only at the buds, in other parts it is unarmed.—Native of Siberia, in gravelly, stony, saline soils.

21. Ribes Saxatile; *Mountain Gooseberry.* Prickles scattered; leaves wedge-form, obtusely three-lobed; racemes erect. This is an intermediate plant between the preceding and fifth species: it has the habit of a *Grossularia*, and the fruit of the *Ribes*. It is nearly upright.—Native of Siberia.

22. Ribes Reclinatum; *Procumbent Gooseberry.* Branches somewhat prickly, reclining; bracte of the peduncle three-leaved; fruit when ripe commonly dark purple, but sometimes red, or even yellow.—Native of Germany, common in cold situations all over Switzerland. It flowers in April, and the fruit is ripe in June and July.

23. Ribes Grossularia; *Rough-fruited Gooseberry.* Branches spreading, prickly; petioles hairy; peduncles one-flowered; bractes two; fruit hairy. Berries green, yellow, or red.—Native of several parts of Europe. Found in woods and hedges about Darlington.

24. Ribes Uva Crispa; *Smooth-fruited Gooseberry.* Branches spreading, prickly; peduncles one-flowered; bractes connate, tubulous; fruit smooth. This differs from the preceding only in the smoothness of the berries, in having the bractes united into a tube at the base, and the hairs of the petioles glandular; all of which are, however, fallacious and uncertain marks.—The name *Gooseberry*, was probably derived from their being eaten as sauce with young, or, as they are commonly called, green geese. From all accounts it is evident that this fruit was at first little valued, but it has received so much improvement by cultivation, that it is become very useful, not only for tarts, pies, and sauces, both fresh and preserved in bottles, but also as an early dessert fruit, for which purpose it is preserved in sugar for winter use. The varieties now best known are: 1. The Red Gooseberries; the Hairy, the Smooth, the Deep Red, the Damson or Dark Bluish, the Red Raspberry, the Early Black Red, the Champaigne, &c. 2. The Green Gooseberries; the Hairy, the Smooth, the Gascoigne, the Raspberry, &c. 3. Yellow Gooseberries; the Great Oval, the Great Amber, the Hairy Amber, the Early Amber, the Large Tawny, or Great Mogul, &c. 4. The White Gooseberries; the Common, the White-veined, and the Large Crystal. Besides these, there is, among two hundred others, the Rumbullion, the Large Ironmonger, the Smooth Ironmonger, and the Hairy Globe. Some of these are of very large size, annually raised from seed, weighing from ten to seventeen pennyweights; but the smaller sorts are better tasted.—Native of the northern parts of Europe. It is not thought to be truly indigenous in this country, though it is common in Cambridgeshire, Norfolk, and other counties, in hedges, on walls and old buildings, and in decaying trees, where the seeds have been deposited by birds.—For its propagation and culture, see the first species. In many parts of Lancashire there are many little societies, where the Gooseberry is annually exhibited: it is a fruit here uncommonly fine; and great attention is paid in the cultivation of it. This is chiefly effected by much more pruning and thinning than that which is generally had recourse to with these sorts of plants, frequent digging about them, and a very liberal use of well-rotted stable-dung incorporated with the mould which is applied near the roots.

25. Ribes Oxycanthoides; *Hawthorn-leaved Currant.* Branches prickly on every side. This has more frequent and milder prickles than the Common Gooseberry. It flowers in April and May.—Native of Canada.

26. Ribes Cynosbati; *Prickly-fruited Currant.* Prickles subaxillary; fruit prickly, in racemes. It flowers in April.—Native of Canada.

27. Ribes Rotundifolium. Spine subaxillary; leaves suborbiculate, subpubescent; lobes subrotund-obtuse; peduncles uniflorous; limb of the calix tubulous; berries glabrous.—Grows on the high mountains of Carolina.

28. Ribes Hirtellum. Spinule subaxillary; branches subhispid; leaves small, semitrifid; lobes subdentated; peduncles uniflorous; berries glabrous, red.—Grows among rocks in the Alleghany mountains, from Canada to Virginia.

29. Ribes Gracile. Spinule subaxillary; leaves with slender petioles, pubescent on both sides; lobes acute, dentate-incise; peduncles capillary, subbiflorous; calix tubulate-campanulate; berries glabrous, purple or blue, of an excellent taste.—Grows on rocks and in mountain-meadows from New York to Carolina.

30. Ribes Lacustris. Spine subaxillary; stem hispid-aculeate on every side; leaves lobated above the middle; petioles villose; berries racemose, hispid, amber-coloured or brown; flowers small, greenish yellow.—Grows in swamps on the mountains from Canada to Virginia.

Riccia; a genus of the class Cryptogamia, order Hepaticæ.—Generic Character. *Male Flowers*, sessile on the surface of the frond. *Calix* and *Corolla:* none. *Stamina:* antheræ conical, truncate, sessile, opening at the top. *Female Flowers*, on the same, or, according to Micheli, on a distinct plant. *Calix:* none, except a vesicular cavity within the substance of the leaf. *Corolla:* none. *Pistil:* germen turbinate; style filiform, erect, reaching the surface of the frond, or exceeding it; stigma simple. *Pericarp:* capsule sessile, globular, one-celled, at the apex of the leaves crowned with the style. *Seeds:* very many, (twenty to thirty,) hemispherical. Linneus has five species natives of Europe, and Dr. Withering the same number natives of Great Britain; but as they are not of sufficient consequence to be detailed here, the reader is referred, for particular descriptions, to their works.

Rice. See *Oryza.*

Richardia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, six-parted, erect, acuminate, shorter by half than the corolla. *Corolla:* one-petalled, cylindrical, funnel-shaped; border

six-cleft, acute, erect. *Stamina:* filamenta six, very short; antheræ roundish, small at the incisures of the corolla. *Pistil:* germen inferior, three-lobed; style filiform, the length of the stamina, three-parted at top; stigmas blunt. *Pericarp:* none. *Seeds:* three, round on one side, angular on the other, at top wider, gibbous. *Observe.* It varies, according to Gœrtner, with the calix and corolla eight-cleft, and eight stamina. ESSENTIAL CHARACTER. *Calix:* six-parted. *Corolla:* one-petalled, subcylindric. *Seeds:* three.——The only known species is,

1. Richardia Scabra. Leaves lanceolate, ovate, alternately nerved, quite entire, subpetioled, rugged; flowers in terminating heads, and also heaped into whorls; the former radiate with four or more leaves, alternately larger and smaller.—Native of Vera Cruz.

Richeria; a genus of the class Diœcia, order Pentandria; or of the class Polygamia, order Diœcia.—GENERIC CHARACTER. *Male Flower. Calix:* perianth one-leafed, permanent, inferior, four-cleft or five-cleft; clefts ovate, acute, subtomentose; (according to Ryan three-leaved, very small.) *Corolla:* petals four or five, roundish, the length of the calix: (Ryan says, one-petalled, with five concave segments.) Nectary four or five glands, at the base of the germen. *Stamina:* four or five, (according to Ryan six,) between the glands of the nectary, erect, longer than the calix, (which the same author describes as the length of the corolla;) antheræ oblong, erect; (Ryan says, twin.) *Pistil:* germen conical, villose; style none; stigma none. *Female Flower. Calix* and *Corolla:* as in the male; nectary a rim round the base of the germen. *Stamina:* none. *Pistil:* germen superior, ovate; style very short; stigmas three, revolute, channelled above. (Ryan describes the stigmas as bicapitate.) *Pericarp:* capsule corticate, subovate, smooth and even, three-celled, having six valves opening from the base. *Seed:* one in each cell, berried, pendulous below the tip of the columella. *Observe.* Ryan remarks, that the fruit is a capsular berry, or a berried capsule. ESSENTIAL CHARACTER. *Capsule:* corticate, six-valved, three-celled. *Seeds:* solitary, pendulous, below the tip of the columella. *Style:* trifid.——The only known species is,

1. Richeria Grandis. A tree, of a great size. Leaves mostly at the ends of the branches, alternate, frequently six or seven inches in length; spikes axillary, solitary, longer than the footstalks, lax; capsule the size of a hazel-nut.—Ryan discovered this very rare tree in Montserrat, in one place only, where fifteen or twenty trees altogether filled up a small valley among the high mountains.

Ricinus; a genus of the class Monœcia, order Monadelphia.—GENERIC CHARACTER. *Male. Calix:* perianth one-leafed, five-parted; segments ovate, concave. *Corolla:* none. *Stamina:* filamenta numerous, filiform, branchingly collected below into various bodies; antheræ twin, roundish. *Females,* on the same plant. *Calix:* perianth one-leafed, three-parted; segments ovate, concave, deciduous. *Corolla:* none. *Pistil:* germen ovate, covered with subulate bristly bodies; styles three, two-parted, from erect spreading, hispid; stigmas simple. *Pericarp:* capsule roundish, three-grooved, prickly all over, three-celled, three-valved. *Seeds:* solitary, subovate. ESSENTIAL CHARACTER. *Male. Calix:* five-parted. *Corolla:* none. *Stamina:* numerous. *Female. Calix:* three-cleft. *Corolla:* none. *Styles:* three, bifid. *Capsule:* three-celled. *Seed:* one.——The species are,

1. Ricinus Inermis; *Smooth-fruited Palma-Christi.* Leaves peltate, subpalmate, serrate; petioles glandular; fruits unarmed. This can hardly be regarded as a distinct species.—Native of the Spanish West Indies. See the next species.

2. Ricinus Communis; *Common Palma-Christi,* or *Castor-oil Plant.* Leaves peltate, subpalmate, serrate; fruits prickly. The root is biennial, thick, long, and whitish, beset with many small fibres. It rises with a strong herbaceous stalk to the height of ten or twelve feet. The joints are at a great distance from each other; the stalks and branches are of a gray colour; the leaves are large, and on long footstalks; they are deeply divided into seven lobes, and are gray on their under sides. The flowers are disposed in long spikes, which spring from the division of the branches: the males are placed on the lower part of the spike; the females, which occupy the upper part, have prickly calices.—Native of the West Indies. This plant, which in our gardens is annual and herbaceous, in Africa becomes a tree. There are several varieties of it; as, the Great American Palma-Christi, with brown stalks that divide into two or three branches, and rise six or seven feet high; the Green-stalked American Palma-Christi, with a thick herbaceous stem of a grayish-green, rising about four feet; the Wrinkled-capsuled Palma-Christi, rising with an herbaceous stalk four feet high; the Red-stalked Palma-Christi, rising ten or twelve feet high, with many joints, and dividing into several branches; the Small American Palma-Christi, seldom rising above three feet high; and the Livid-leaved Palma-Christi, an evergreen tree about ten feet high, growing in the East Indies.—In the West Indies, the oil is used in the boiling-house lamps by many of the sugar-planters. The roots are looked upon as strong diuretics; and the leaves are generally used to dress blisters. In China the oil is rendered esculent and palatable, but is seldom used in medicine. In Japan, the seeds pounded with Mouxa and Touche or Japan ink, are put into a little box or case, over which a piece of silk is stretched, and that is besmeared with oil, that the powder underneath may be moistened by it: whenever a Japanese has occasion to put his seal, which is often curiously wrought in horn, to any thing, he first dips the seal into this box, and then impresses it upon the writing. Thus this powder supplies the place of printers' ink, and it is therefore necessary that the silk should be moistened afresh with oil as fast as it dries. The well-known Castor-oil, so useful as a speedy but gentle purgative, is extracted from the seeds of this plant. The London College directed it to be expressed in the same way as that of almonds, and without the assistance of heat, by which method it would seem to be obtained in the purest state; but there is much reason to suppose that this is seldom practised, and that the oil usually employed here is imported from the West Indies, where it is commonly prepared by freeing the seeds from the husks, bruising them in a mortar, tying them up in a linen bag, throwing them into a large pot, with about eight gallons of water to one gallon of seeds, and boiling them till the oil is risen to the surface; when it is carefully skimmed off, strained, and kept for use. Thus prepared, the oil is entirely free from acrimony, and will stay upon the stomach even when it loathes most other medicines: but its mildness seems to be chiefly owing to the action of the fire, for the expressed oil, as well as the mixed juices of the seed, is, according to Browne, far more violent in its operations. The oil intended for medicinal use is more frequently cold-drawn, or extracted from the bruised seeds by means of a hand-press; but this was thought more acrimonious than what is prepared by boiling. It is now well known, however, that oil obtained by boiling becomes much sooner rancid than that by expression. The best sort is limpid, and destitute of taste or smell. Castor-oil, observes the celebrated Dr. Cullen, when the stomach can be reconciled to it, is one of the most agreeable purgatives we can employ. It has these advantages, that it commonly ope-

RICINUS COMMUNIS, or RUGOSUS ——— *The Wrinkled Capsuled Palma Christi.*

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rates in two or three hours, seldom gripes, and is generally moderate in its operation. It is particularly suited to cases of costiveness, and even of spasmodic colic; and is one of the most certain remedies in the dry belly-ache. It has been found efficacious in various febrile complaints, in bilious colics, nephritic cases, worms, and especially the tape-worm. As it does not heat nor irritate the rectum, it is an excellent purgative for those who are troubled with the piles. The only inconvenience attending this medicine is, that it is nauseous to those who dislike oil, and that when the dose is large it occasions sickness at the stomach. The most ready means of obviating these objections is, to take it in as much ardent spirit as will enable the patient to swallow it at once without tasting it, while it floats in the glass entirely surrounded by the spirituous liquor. Whenever there is reason to suspect a tendency to inflammation in the bowels, water will serve the same purpose equally as well; and in both cases it will be found the best way to take this medicine. In the West Indies they use their staple rum for this same purpose; but when spirits are to be employed, as in spasmodic colics, tincture of senna is better, being less irritating; and when mixed intimately by being shaken together in a phial, in the proportion of one part of the senna to three of the oil, the latter will sit more pleasantly on the stomach. The common dose is a table-spoonful, or half an ounce, but many persons require a double quantity. It is remarkable, that if this medicine be frequently repeated, the dose may be gradually diminished; insomuch that persons of a costive habit, who at first required half an ounce or more for a dose, have afterwards found two drachms enough, at least sufficient to keep the body regular.—*Propagation and Culture.* These plants are generally annuals in England, though in their native places of growth they continue longer, and are often preserved through the winter in this country; though young plants are much preferable to those thus preserved. On this account few persons are at the trouble to keep them, unless when the seasons prove so bad as that their seeds do not ripen, whereby the species might be lost, if the plants were not preserved through the winter. They are propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are come up they should be each planted into a separate pot filled with light fresh earth, and plunged into a fresh hot-bed, observing to water and shade them until they have taken root; after which they must have a great share of free air when the season is mild, otherwise they will draw up tall and weak: and as these plants grow very fast, their roots will in a short time fill the pots; they should then of course be shifted into larger pots filled with the like fresh earth, and towards the end of May, when the season is warm, they may be hardened to endure the open air by degrees; and then, if some of the plants are shaken out of the pots, and planted out into a very rich border, and in dry weather duly watered, they will grow to a very large size, and produce a great quantity of flowers and seeds: but if it be intended to preserve any of the plants through the winter, they must not be planted in the full ground, because after the roots have been widely extended, there will be no transplanting them with safety; therefore the best way is to shift them into larger pots from time to time, as their roots shall require, placing them in the open air during the summer season in some warm situation, where they may remain until October, when they must be removed into the green-house with other exotic plants, observing to water them sparingly in winter, and also to admit the free air in mild weather; for they only require to be protected from frost and cold winds. These plants deserve a place in every curious garden, for the singular beauty of their leaves, (although their flowers make no great appearance;) and those persons who have no green-house to place them into in winter, may cultivate them as other annual plants, amongst which these being placed either in pots or on borders, afford an agreeable variety; but as these are large-growing plants, never place them too near others of less growth, because they will overbear and destroy them; and those which are planted in pots should be allowed room for their roots to spread, and must be frequently watered, otherwise they will not grow very large.

3. Ricinus Tanarius. Leaves peltate-repand. This is a middle-sized tree, with twisting spreading branches.—Native of the East Indies.

4. Ricinus Mappa. Leaves peltate, undivided.—Native of Ternate, the Molucca Islands, and Tanna in the South Seas.

5. Ricinus Apetala. Leaves petioled at the base, conical, quite entire. This is a shrub, four feet high, and very much branched.—Native of China.

6. Ricinus Dioicus. Leaves cordate, acuminate; flowers dicœcous; capsules muricated. A shrub, with round, smooth, brown branches.—Native of Tanna.

Ricotia; a genus of the class Tetradynamia, order Siliquosa.—Generic Character. *Calix:* perianth four-leaved; leaflets oblong, parallel, approximating, deciduous. *Corolla:* four-petalled, cruciform; petals obcordate, spreading. *Stamina:* filamenta six, four the length of the tube, two opposite a little shorter; antheræ oblong, acute. *Pistil:* germen cylindrical, the length of the stamina; style scarcely any; stigma acute. *Pericarp:* silique lanceolate, ovate, one-celled, two-valved; valves flat. *Seeds:* about four, orbicular, compressed. Essential Character. *Silique:* one-celled, oblong, compressed, with flat valves.——The only known species is,

1. Ricotia Ægyptiaca. An annual plant, with a stem about a foot high, smooth and branching; flowers purple, on long stalks; pods drooping.—Native of Egypt.

Rittera; (see *Swartzia*) a genus of the class Polyandria, order Monogynia.—Essential Character. *Calix:* four-leaved. *Petal:* one, lateral. *Legume:* one-celled, two-valved.——The species are,

1. Rittera Simplex. Leaves simple; petal roundish, obovate, larger than the calix, many-stamined.—Native of the Caribbee Islands.

2. Rittera Grandiflora. Leaves simple, oblong, ovate; peduncles subtriflorous; petal roundish, kidney-form, very large; legumes oblong. This is a middle-sized tree, with round, smooth, subdichotomous branches, of a brown colour, except the younger ones, which are green.—Native of the island of Trinidad.

3. Rittera Dodecandra. Leaves simple; petal oblong, the length of the calix; flowers twelve-stamined. This is tenderer and smaller in all its parts than the first species.—Native of South America.

4. Rittera Triphylla. Leaves ternate; petioles margined. This is a middle-sized tree, with a trunk from seven to eight feet in height, and seven or eight inches in diameter, with a smooth thin gray bark, and a yellowish hard compact wood. The seeds, one to four in number, have a very disagreeable taste, and are very acrid, inflaming and swelling the lips of those who bite them.—Native of the forests of Guiana, near the source of the creek of the Galibis; flowering and fruiting in the month of May. The French call it *Bois dard* or *Bois a fleche*, because the natives arm their arrows at the point with a piece of the wood cut very sharp.

5. Rittera Pinnata. Leaves pinnate; branches round, smooth.—Native of the island of Trinidad.

Rivina; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Calix:* perianth four-leaved, coloured, permanent; leaflets oblong-ovate, blunt. *Corolla:* none, unless the calix be taken for it. *Stamina:* filamenta four or eight, shorter than the calix, approaching by pairs, permanent; antheræ small. *Pistil:* germen large, roundish; style very short; stigma simple, blunt. *Pericarp:* berry globular, placed on the green reflex calix, one-celled, with a point curved in. *Seed:* one, roundish, lens-shaped, rugged. Essential Character. *Calix:* four-leaved, coloured, permanent. *Corolla:* none. *Berry:* containing one lens-shaped seed.——The species are,

1. Rivina Humilis; *Downy Rivina.* Racemes simple; flowers four-stamined; leaves pubescent. Stem bushy, shrubby, three or four feet high. It flowers most part of the year in our stoves, decorated with clusters of little scarlet berries, which make the chief beauty of the plant.—Native of the West Indies. This, and all the shrubs of this genus, are propagated by seeds, which remain long in the ground before they vegetate: they never rise the same year they are sown. They must be procured from the countries where they naturally grow, and, when they arrive, should be sown in pots filled with fresh earth, and plunged into a moderate hot-bed. If this happens late in the autumn or the winter, the pots must be plunged into the tan-bed of the stove; but if in the spring, they may be plunged into a common hot-bed under a frame. The earth must be moistened frequently in summer, to promote the vegetation of the seeds; but as they will not come up the same year, the pots should be removed into the stove before winter, and plunged into the tan-bed. In winter they may be sometimes, yet but slightly, watered. In the spring take the pots out of the stove, and plunge them into a fresh hot-bed to bring up the plants; but if they should not then rise, the earth must not be disturbed, because the plants may come up in the following season. When they have risen two inches out of the ground, transplant each of them into a separate small pot filled with light loamy earth, and plunge these pots into a hot-bed, shading them from the sun till they have taken new root; after which, they must be treated in the same way as other plants from the same countries. These plants being tender, cannot be preserved in this country unless they are kept in a warm stove, especially while they are young; but when they have obtained strength, they will live in a moderate warmth during winter, and in summer they may be removed into the open air, placing them in a sheltered situation for about three months of the hottest part of the summer. Water them very cautiously in winter, for as they are natives of a dry soil, much moisture would destroy them in cold weather.

2. Rivina Lævis; *Smooth Rivina.* Racemes simple; flowers four-stamined; leaves ovate, acuminate, smooth, flat; stem round. This very much resembles the preceding, but is wholly smooth. The leaves are purplish about the edge, and the flowers are red on the outside.—Native of the West Indies. See the preceding species.

3. Rivina Brasiliensis; *Wave-leaved Rivina.* Racemes simple; flowers four-stamined; leaves ovate, waved, and wrinkled; stem grooved. Stem shrubby; flowers white or reddish; berry round, of a shining red. It blossoms in the stove in June and July.—Native of Brazil.

4. Rivina Octandra; *Climbing Rivina.* Racemes simple; flowers eight-stamined or twelve-stamined; leaves elliptic, smooth. This rises with a climbing woody stalk to the height of twenty feet, covered with a dark gray bark. The berries, which are blue, form, according to Browne, the principal part of the food of the American Thrush or Nightingale: they contain a very oily seed; and after the bird has swallowed of them, he is frequently observed to perch upon the next Bird-Pepper Bush, (see *Capsicum,*) and pick a few of those warm berries; being taught by natural instinct, that they were necessary to assist the digestion of the former heavy and oleaginous food. The stalk of this plant is so very tough and flexile, and it is often made into hoops in Jamaica, when there is a scarcity of those imported from Europe or North America, but they are not so strong and durable; hence in Jamaica it is called *Hoopwithe.*—Native of the West Indies; found also at the Havannah. See the first species.

Rivularia. See *Conferva* and *Ulva.*

Robergia; a genus of the class Decandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, permanent; segments roundish, concave. *Corolla:* petals five, roundish, the length of the calix. *Stamina:* filamenta ten, inserted into the receptacle, the length of the corolla; antheræ roundish. *Pistil:* germen roundish, villose, superior; styles five, capillary; stigmas thickish, grooved. *Pericarp:* drupe ovate, more convex on one side, very slightly hollowed on the other. *Seeds:* nut the form of the drupe, one-celled, with a two-valved shell. Essential Character. *Calix:* five-parted. *Petals:* five. *Drupe:* with a one-seeded nut, and a two-valved shell.—— The only known species is,

1. Robergia Frutescens. Stem shrubby, supporting itself by the neighbouring trees; leaves alternate, unequally pinnate, four-paired; flowers in axillary branched panicles, white, with a smell sweeter than those of the Lilac.—Native of the woods of Guiana, flowering and fruiting in August.

Robinia; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, small, bell-shaped, four-cleft; the three lower toothlets more slender, the upper one wider, scarcely emarginate to the naked eye, all equal in length. *Corolla:* papilionaceous; standard roundish, larger, spreading, blunt; wings oblong-ovate, free, with a very short blunt appendix: keel almost semiorbicular, compressed, blunt, the length of the wings. *Stamina:* filamenta diadelphous, one simple, the other nine combined,) ascending at top; antheræ roundish. *Pistil:* germen cylindrical, oblong; style filiform, bent upwards; stigma villose in front, at the top of the style. *Pericarp:* legume large, compressed, gibbous, oblong. *Seeds:* few, kidney-form. Essential Character. *Calix:* four-cleft, the upper segment divided. *Stamina:* in two distinct sets. *Legume:* gibbous, elongated.——The species are,

1. Robinia Pseud-Acacia; *False* or *Common Acacia.* Racemes with pedicels one-flowered; leaves unequally pinnate; stipules thorny; legumes smooth, compressed. This tree grows very fast while young, so that in a few years the plants rise from seeds to eight or ten feet high; and it is not uncommon to see shoots six or eight feet long produced in one summer. The branches are armed with strong crooked thorns. The flowers come out from the side of the branches in pretty long bunches, hanging down like those of Laburnum; each flower on a slender pedicel, white, and smelling very sweet: they appear in June, and, when the trees are full of flowers, make a beautiful appearance, besides perfuming the air all round; but they seldom continue more than one week. Even in England it is a very beautiful tree, whether it feathers to the ground, or is adorned with a light foliage; the misfortune however is, that its beauty is so frail, it being most unable of all trees to bear the blast.—Native of North America, where it grows to a very large size, and the wood is much valued

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P. 442.

P. 477.

QUERCUS ÆGILOPS.—

Great Prickly-cupped Oak Tree.

Male Flower.

Cup.

Acorn.

ROBINIA HISPIDA.—

Rose Acacia.

D. W. Campbell

Published by Henry Fisher, Caxton, Liverpool. May 1819.

for its duration. Most of the houses which were built at Boston in New England, on the first settling of the English there, were constructed of this timber. The wood when green is of a soft texture, but becomes very hard when dry: it is as durable as the best white Oak, and esteemed preferable for axle-trees of carriages, trenails for ships, and many other mechanical purposes: and it makes excellent fuel. The shade of this tree is less injurious to grass than that of most others. The leaves are said to afford wholesome food for cattle. It has been successfully employed for ship-building in Virginia, and proved far superior to American Oak, Elm, Ash, &c. for that purpose; and posts of it, made for rail fencings, stand wet and dry next the ground better than any other in common use; almost as well as posts of the Swamp Cedar. There are several varieties of this species, one of which has no thorns on the branches.—In the English nurseries it is generally propagated by suckers from the roots of old trees; or by cuttings of some of the young shoots, planting them upon a gentle hot-bed. But these are not so valuable as plants raised from seeds, because they do not make great progress, and are very subject to send forth many suckers. Sow the seeds on a bed of light earth, at the end of March or beginning of April. If the bed be well exposed to the sun, the plants will appear in five or six weeks, and will require no further care than to keep them clear from weeds. In the following spring, about the end of March transplant them into a nursery, in rows three feet distant, and a foot and half asunder in the rows. After two years more, they will be fit to plant where they are designed to grow; for as they send forth long tough roots, if they stand long unremoved, the roots will be cut off when they are transplanted, which sometimes occasions their miscarrying.—This tree will grow well upon almost any soil, but best in such as is light and sandy. Whilst young and well furnished with leaves, it makes an agreeable appearance; but when old, the branches being frequently broken by winds, it is rendered unsightly, especially in an exposed situation.

2. Robinia Sepium; *Hedge Robinia.* Unarmed: peduncles racemed, the partial ones two-flowered; leaves unequally pinnate; pinnas ovate, acuminate. This is a thornless tree, growing to the height of thirty feet, very much resembling the preceding in habit, and dividing into round almost upright very long branches; clusters rather drooping, of numerous purple flowers.—Native of the banks of rivers, in the recesses of mountains of the West Indies, flowering in March and April. This, with the third, fifth, tenth, eleventh, and fifteenth species, being tender, cannot be preserved in England, without being placed in a stove in winter. They are propagated by seeds procured from the countries where they grow naturally. Sow them in small pots filled with earth from the kitchen-garden, and plunged into a hot-bed of tanners' bark. The plants will appear in six weeks or two months. When they are strong enough to transplant, shake them out of the pots, and put each plant into a small pot filled with the same earth, plunging them into a tan-bed, and shading them till they have taken new root, and then treating them as other tender plants. Whilst the plants are young, they are more tender than afterwards; therefore it will be proper to keep them in the tan-bed for two or three years; but when they have obtained strength, they may be kept in a dry-stove of a temperate heat in winter, and in summer they may be exposed to the open air in a sheltered situation. Some of them may be propagated by cuttings.

3. Robinia Violacea; *Ash-leaved Robinia.* Racemes with pedicels two-flowered; leaves unequally pinnate; stem unarmed. This is an upright thornless tree, growing to the height of twelve feet. The flowers have the smell and colour of Violets.—Found at Carthagena. For its propagation and culture, see the preceding species.

4. Robinia Hispida; *Rose Acacia* or *Hairy Robinia.* Racemes axillary; leaves unequally pinnate; stem unarmed; branches, calix, and flower-stalks, hispid. This tree is of low growth in England, though in its native country, Carolina, it grows twenty feet high: in the former country, the branches spread out near the ground, and produce their flowers while very young. The flowers are of a deep rose colour, but have no scent, though they make a fine appearance. It does not produce its seeds in Great Britain.—This plant is propagated by cutting off part of the roots, and placing them upon a gentle hot-bed, where they will put out fibres and shoots. It requires a sheltered situation and a light moist soil. Though the ordinary winters of this country never injure it, yet it is liable in exposed places to be killed by severe seasons. It may be also increased by layers, and by grafting; is of a ready growth, disposed to flower even while young; and not nice as to soil and situation. Its large beautiful branches render it one of the most valuable shrubs we have for ornamental plantations.

5. Robinia Mitis. Racemes with pedicels in threes; leaves unequally pinnate; stem unarmed. A tree of lofty growth: calix purple; petals white; legume ovate, pointed, thick and woody.—Native of the East Indies, China, and Cochin-china.

6. Robinia Caragana; *Siberian Pea Tree.* Peduncles simple, very many; leaves abruptly pinnate, four or five paired; petioles unarmed: legumes cylindrical. Trunk arboreous, commonly branched from the bottom, slender, with a smooth shining coriaceous bark. Flowers numerous, large, yellow. The wood is hard, compact, very tough, yellow on the outside, within waved, and striped with bay and red. The leaves are good fodder for cattle; and it is suggested, that they contain a blue colouring matter like Indigo. The bark is very tough, and fit for tyeing; the twigs may also be used as withes, and the seeds are good for poultry. It flowers in April and May.—Native of Siberia.—This, with the seventh, eighth, ninth, twelfth, thirteenth, and fourteenth species, are propagated from seeds sown in a shady situation in autumn, and the plants will come up in the following spring. When they appear, they will require no other care but to keep them clean from weeds till autumn; when, if they have made any progress, they should be planted on a north border, at about six inches' distance, where they may grow two years, and then be planted out where they are to remain, which should be in a cool moist soil, not much exposed to the sun. They may also be increased by the roots, by layers, and by grafting.

7. Robinia Spinosa; *Thorny Robinia.* Peduncles simple, subsolitary; leaves abruptly pinnate, many-paired; petioles spinescent; legumes cylindrical. This resembles the preceding, from which it is distinguished by its stiff or thorny stipules. The trunk is scarcely an inch and half in diameter, with branches often a fathom in length, subdivided, twisted, and diffused, so as to form a hemispherical head full of branches and thorns. Being covered with yellow flowers during the summer, it appears very beautiful. Wood bay-coloured within, on the outside yellow, and very hard. On account of the length and toughness of the branches, and its large stout thorns, this shrub is admirably adapted to form impenetrable hedges.—It is a native of Siberia, and also of China; where, about Pekin, they stick their bushes in clay on the tops of their walls, to prevent persons from climbing or looking over them. See the preceding species.

8. Robinia Altagana; *Daurian Robinia.* Peduncles simple, single-flowered, solitary; leaves abruptly pinnate, seven or eight paired; stipules spinescent; legumes compressed; root sparingly branched, having somewhat of the smell and taste of liquorice.—Native of Dauria. See the sixth species.

9. Robinia Chamlagu; *Shining Robinia.* Peduncles simple, subsolitary; leaves abruptly pinnate, two-paired; petioles and stipules spinescent; branches decumbent. A hardy shrub, flowering in May and June. Flowers large, pendulous, yellow; the disk of their standard first green, afterwards deep red.—Native of China. See the sixth species.

10. Robinia Squamata. Racemes with pedicels, one-flowered; leaves unequally pinnate; leaflets oval, spiny, mucronate; petioles unarmed.—Native of the island of St. Thomas in America. See the second species.

11. Robinia Florida. Peduncles simple, one-flowered; leaves abruptly pinnate; petioles and stipules unarmed. This very handsome shrub is leafless in the time of flowering, when it is quite covered with flowers.—Native of Krabben island in America. See the second species.

12. Robinia Halodendron; *Salt-Tree Robinia.* Peduncles three-flowered; leaves abruptly pinnate, two-paired; petioles and stipules spinescent; legumes inflated. This is a small irregular tree or shrub, commonly of the height of a man; it is very much branched, and rigid, but silky all over.—Native of Siberia, in dry salt-fields, growing by the river Irtis, and flowering in June. It flourishes in gardens, but has never produced flowers in them, probably for want of the saline principle in the soil. See the sixth species.

13. Robinia Frutescens; *Shrubby Robinia.* Peduncles simple; leaves in fours, subpetioled, terminated by an unarmed spine. It grows with a shrubby stalk eight or ten feet high, sending out several branches which grow erect, covered with a smooth yellowish bark. Flowers yellow.—Native of Siberia.—See the sixth species.

14. Robinia Pygmæa; *Dwarf Robinia.* Peduncles quite simple; leaves in fours, sessile. Trunk covered with a shining yellowish bark; wood of a very deep bay, almost as hard as horn.—Native of Siberia, where this elegant species begins by the Irtis, in the southern rocky open parts; becomes more frequent by the Jenisca; and most common in the regions beyond the lake Baikal. It rises commonly with twigs an ell in height; these twigs are very tough, and fit for withes; and the flowers are of an elegant golden colour. See the sixth species.

15. Robinia Subdecandria. Racemes simple; filamenta almost distinct; leaves unequally pinnate; stem unarmed. Root branched, having the smell and taste of Liquorice.—Native of Myssinia. See the second species.

16. Robinia Amara; *Bitter-rooted Robinia.* Racemes elongated; pedicels in threes; leaves unequally pinnate, five or six paired; stem unarmed.—Native of China and Cochin-china.

17. Robinia Flava. Peduncles in threes, three-flowered, terminating; leaves abruptly pinnate, seven or eight paired; stem unarmed. A shrubby plant; root simple, woody, thick, yellow, bitter; flowers white, terminating, with peduncles in threes, upright, and three-flowered.—Native of China.

Robinsonia; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, five-toothed; teeth acute. *Corolla:* petals five, roundish, concave, spreading, inserted into the calix. *Stamina:* filamenta very many, capillary, thickened towards the top, inserted into the calix below the petals; antheræ two-celled; cells oblong, divaricated at the base. *Pistil:* germen superior; style none; stigma oblong, striated. *Pericarp:* berry globular-depressed, scored longitudinally with many contiguous grooves, crowned with the teeth of the calix, fleshy, seven-celled; partitions membranaceous. *Seeds:* solitary, oblong, compressed, outwardly convex, villose. Essential Character. *Calix:* five-toothed. *Petals:* five. *Berry:* striated, seven-celled; cells one-seeded. *Seeds:* villose.——The only known species is,

1. Robinsonia Melianthifolia. A large and lofty tree, with a wrinkled bark, and red wood; the branches spreading, and quadrangular. Leaves opposite, pinnate; flowers yellow, minute, in a terminating panicle; berry an inch in diameter, eatable.—Native of the woods of Guiana.

Rocambole. See *Allium.*

Rochefortia; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments ovate, blunt. *Corolla:* one-petalled, funnel-form; tube short, aperture open; border five-parted; segments ovate-oblong, spreading. *Stamina:* filamenta five, inserted in the throat of the corolla at the openings, awl-shaped; antheræ oblong. *Pistil:* germen superior, roundish, compressed; styles two, awl-shaped; stigma simple. *Pericarp:* subglobular, two-celled. *Seeds:* few, angular. Essential Character. *Calix:* inferior, five-parted. *Corolla:* one-petalled, funnel-form, with the aperture open. *Fruit:* two-celled, many-seeded.——The species are,

1. Rochefortia Cuneata; *Wedge-leaved Rochefortia.* Leaves wedge-shaped, obovate, entire. This is a shrub three or four feet high, with a branching, upright, stem; the branches gray, round, zigzag, and subdivided, armed with a solitary projecting thorn, near the insertion of each footstalk; leaves about three together, in alternate tufts, stalked, rather rigid, smooth, of a brownish green, paler beneath, slightly ribbed; flowers small, greenish or whitish, in dense, forked, cymose, terminal or axillary clusters; calix, germen, and stigmas, downy.—Native of Jamaica, where it is found on dry rocky mountains.

2. Rochefortia Ovata; *Ovate-leaved Rochefortia.* Leaves ovate, emarginate. This is a small tree, with round smooth branches; flower-stalks a fifth only of the length of the leaves, each bearing many flowers in pairs; germen smooth.—Native of Jamaica.

Rock Cress. See *Iberis Nudicaulis.*

Rocket. See *Brassica Eruca.*

Rocket, Base. See *Reseda Lutea.*

Rock Rose. See *Cistus Populifolius.*

Roella; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, five-parted, permanent, superior; segments lanceolate, acute, toothed, large. *Corolla:* one-petalled, funnel-form, deciduous; tube a little shorter than the calix; border from upright spreading, five-parted, longer than the calix; nectary of five converging scales, at the bottom of the corolla. *Stamina:* filamenta five, awl-shaped, placed on the nectary; antheræ awl-shaped, converging, the length of the filamenta, and height of the calix. *Pistil:* germen oblong, inferior; style filiform, the length of the stamina; stigmas two, oblong, depressed, spreading. *Pericarp:* capsule cylindrical, shorter than the calix, crowned with its enlarged spreading segments, two-celled, (Bergius says, subbilocular; and Gærtner, unilocular,) opening at top by a large round hole. *Seeds:* very many, angular. *Observe.* It is allied to *Campanula.* Essential Character. *Corolla:* funnel-form, with the bottom closed by staminiferous valves. *Stigma:* bifid. *Capsule:* two-celled, (according to Gærtner, one-celled,) cylindrical, inferior.——The species are,

1. Roella Ciliata; *Ciliated Roella.* Leaves lanceolate, ciliate; flowers subsolitary, terminating. This is a low shrubby plant, somewhat like Heath when in flower. When the flower is recently expanded, five shades of colour appear, which, being disposed in circles, produce a striking effect; the bottom of the flower is white, of a yellowish cast; next succeeds a circle of deep blue inclining to black, with a surface highly glazed; the next circle is a grayish-blue, resembling satin; the next nearly white; and the outermost pale purple. It flowers in June, and continues several weeks.—Native of the Cape of Good Hope, and of Barbary.—This, and also the other shrubby species of this genus, may be increased by cuttings, but not very readily. They are not so easy of culture as many other plants, and must be kept in a dry-stove, good green-house, or glass-case.

2. Roella Squarrosa; *Trailing Roella.* Leaves ovate, toothed, ciliate; flowers terminating, aggregate. Stem herbaceous, diffuse. It flowers in June.—Native of the Cape.

3. Roella Decurrens; *Decurrent Roella.* Leaves lanceolate, quite entire, decurrent; flowers solitary, terminating. It flowers in September.—Native of the Cape.

4. Roella Muscosa; *Mossy Roella.* Herbaceous, diffused: leaves ovate, toothed, reflex; flowers terminating, solitary. A very small annual species.—Native of the Cape.

5. Roella Spicata; *Spiked Roella.* Leaves lanceolate, ciliate; flowers terminating, aggregate. Stem shrubby, erect. —Native of the Cape.

Rohria; a genus of the class Triandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-parted; segments ovate, concave, blunt, ciliate, coriaceous; the two inner ones a little longer. *Corolla:* petals five, upright, longer than the calix, the two upper ones a little larger, the three lower smaller; claws narrow, wider at the base, woolly within, a little bent outwards under the border, which is ovate, erect, in the larger petals bent inwards and cowled, in the smaller spread out and bluntish. *Stamina:* filamenta three, one between the two larger petals, and two by the side of them, united at bottom with their claws, all filiform, longer than the corolla, woolly within; antheræ roundish, erect, directed inwards. *Pistil:* germen turbinate, tomentose; style filiform, the length of the stamina, villose; stigmas three, revolute. *Pericarp:* doubtful whether a capsule or nut. *Seeds:* not ascertained. Essential Character. *Calix:* bell-shaped, five-parted. *Corolla:* five-petalled, unequal. *Stigmas:* three, revolute. *Capsule?* ——The only known species is,

1. Rohria Petioliflora. A shrub, about twelve feet in height, with many flexible, roundish, smooth branches. Leaves alternate, petioled, oblong, acuminate, quite entire, netted, veined, about four inches long; flowers small and yellow.—Native of the woods of Guiana.

Rolandra; a genus of the class Syngenesia, order Polygamia-Segregata.—Generic Character. *Calix:* common none; florets in bundles, in a roundish head; bundles distinct, pedicelled, with many scales interposed, shorter than the florets, ovate and lanceolate, awned; partial perianth chaffy, two-valved; valves unequal, compressed, keeled, the upper one larger, enclosing the other, awned; lower acuminate. *Corolla:* proper, hermaphrodite, very small, funnel-shaped; tube filiform, long; border five-cleft; segments very short, erect, acute. *Stamina:* filamenta five, shorter than the tube; anthera tubular within the aperture. *Pistil:* germen compressed, three-cornered, acute at the base, retuse at the top; style the length of the tube, bifid at the top; stigmas tumid, erect. *Pericarp:* none, the seed being enclosed in the unchanged partial calix. *Seeds:* three-cornered, crowned with a toothed rim. Essential Character. *Common Calix:* none. *Perianth:* two-valved, single-flowered. *Florets:* hermaphrodite. *Seed:* with a toothed crown. ——The only known species is,

1. Rolandra Argentea. Stem straight, woody, covered with a smooth reddish-brown bark; having at every inch or two, one, two, or three leaves, greater and smaller, the largest about two inches long, and three quarters broad in the middle, smooth, dark-green on the upper side, and very white underneath, on a short footstalk; flowers in small, round, sessile, solitary, axillary, whitish heads.—Native of the W. Indies.

Rondeletia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, superior, five-parted, acute, permanent. *Corolla:* one-petalled, funnel-shaped; tube cylindrical, longer than the calix, bellying a little at top; border five-parted, from reflex flat; segments roundish. Nectary a crenate rising in the orifice. *Stamina:* filamenta five, awl-shaped, almost the length of the corolla; antheræ simple. *Pistil:* germen roundish, inferior; style filiform, the length of the corolla; stigma bifid. *Pericarp:* capsule roundish, crowned, two-celled. *Seeds:* two or more in each cell, rarely solitary. Essential Character. *Corolla:* funnel-shaped, nectariferous at the mouth. *Capsule:* two-celled, inferior, many-seeded, roundish, crowned with the calix.——The species are,

1. Rondeletia Americana. Leaves sessile; panicle dichotomous. Stalk woody, ten or twelve feet high, branching out on every side; the branches covered with a smooth greenish bark; the flowers come out in bunches at the end of the branches, are white, and have little scent. They appear in autumn, but are not followed by seeds in England. Native of the Spanish West Indies.—All the plants of this genus being very tender, require a warm stove in our climate. They are propagated by seeds, which should be sown on a hot-bed early in the spring; and when the plants are come up and fit to remove, they must be planted in separate small pots, and plunged into a moderate hot-bed of tanners' bark, and be treated in the same manner as other tender West Indian Plants. In winter, place them in the tan-bed in the stove, where they will thrive, and in two or three years will flower, and form an agreeable variety amongst other tender exotic plants, as they retain their leaves all the year.

2. Rondeletia Odorata. Leaves petioled, subovate, blunt; flowers cymose, three-cleft, terminal. This is an inelegant, irregular shrub, five or six feet high; branches round, the younger ones villose; flowers handsome, scarlet, with the projecting rim of the tube orange-coloured, smelling very sweet like violets.—Native of the West Indies, where it is not very common; Jacquin observed it at the Havannah, in rocky coppices near the coast, growing frequently on the very naked rocks. It flowers in January, and is, at the same time, loaded with ripe seeds.

3. Rondeletia Trifoliata. Leaves tern, tomentose underneath; panicles axillary. This is an upright tree, twelve feet high.—Native of America.

4. Rondeletia Virgata. Leaves roundish; branches filiform, spreading; peduncles trifid; flowers three together, clustered, four-stamined. This shrub is six feet high, with very long, alternately spreading, unarmed branches, with a rugged bark. It flowers and fruits in December.—Native of Hispaniola, in maritime coppices towards the north.

5. Rondeletia Pilosa. Leaves ovate, hairy on both sides; peduncles axillary, shorter than the leaves, trifid; flowers four-stamined. A shrub, whose branches are round or four-cornered; corolla salver-shaped; tube cylindrical.—Native of Santa Cruz and Montserrat, in the West Indies.

6. Rondeletia Thyrsoidea. Leaves oblong, acute, membranaceous, pubescent underneath; thyrses axillary. Trunk six feet high, branched, upright, even, with an ash-coloured bark; flowers inodorous, small, reddish; they appear in February.—Native of the driest hills of Jamaica, in the western part of the island.

7. Rondeletia Racemosa. Leaves lanceolate-ovate, acuminate, smooth on both sides; stipules elliptic, with a short point; racemes axillary, trichotomous, patulous. Branches round, spreading, covered with an irregular hoary bark.—Native of Jamaica, on the mountains.

8. Rondeletia Laurifolia. Leaves lanceolate-oblong, acute, smooth on both sides; stipules deltoid; racemes compound, axillary, erect; tube of the flowers very short. Branches round, smooth; flowers small, brownish-yellow, five-cleft.—Native of Jamaica, in bushy places.

9. Rondeletia Tomentosa. Leaves ovate, acuminate, tomentose; peduncles three-parted, axillary, short. This shrub is nearly three feet high, upright, branched above, even; branches and branchlets opposite, round, upright, somewhat villose at the top.—Native of Jamaica, on rocky hills, as in Sixteen-mile Walk near Spanish Town.

10. Rondeletia Umbellulata. Leaves lanceolate-ovate, acute, subhirsute; peduncles axillary, trichotomous at top; flowers subumbelled.—Native of Jamaica, on rocks near streams; flowering in April.

11. Rondeletia Incana. Leaves ovate-lanceolate underneath, hoary, rugged; peduncles axillary, simple, three-flowered. Shrub from two to three feet in height, upright, branched, rugged. This species is very distinct in its habit, flowers, and hoariness.—Native of Jamaica.

12. Rondeletia Hirsuta. Leaves oblong, acute, hirsute; peduncles axillary, trichotomous, loose; flowers hirsute. This shrub is six feet high, branched, and even.—Native of Jamaica, on bushy hills, flowering in January.

13. Rondeletia Hirta. Leaves oblong, acuminate, rough-haired, rigid, nerved underneath; peduncles axillary, trichotomous, erect. Corolla reddish-yellow.—Native of Jamaica.

14. Rondeletia Buxifolia. Leaves obovate, smooth; flowers four-stamined, axillary, solitary; branches smooth, jointed. —Native of Montserrat.

Roridula; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved; leaflets lanceolate, equal, permanent. *Corolla:* petals five, ovate-oblong, equal, larger than the calix. *Stamina:* filamenta five, awl-shaped, shorter by half than the corolla; antheræ inserted above their base, awl-shaped, semibifid, gaping at the top; nectary from the scrotiform base of the anther protruded downwards. *Pistil:* germen oblong; style filiform, the length of the stamina; stigma truncate, subtrilobate. *Pericarp:* capsule oblong, three-cornered, three-celled, three-valved; partitions contrary to the valves. *Seeds:* solitary, oval, angular on one side. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Antheræ:* scrotiform at the base. *Capsule:* three-valved, three-celled. ——The only known species is,

1. Roridula Dentata. Stem shrubby, branched, round, smooth, purplish; leaves clustered, alternate, sessile, half-embracing, awl-shaped, with filiform teeth, ciliate; flower-stalks woolly, each bearing about four large handsome flowers.—Native of bogs at the Cape.

Rosa; a genus of the class Icosandria, order Polygynia. —Generic Character. *Calix:* perianth one-leafed; tube ventricose, contracted at the neck; with the border spreading, five-parted, globular; segments long, lanceolate, narrow, (two of which are usually fringed at both edges, with unequal leafy appendages; the third, at one edge only; the two remaining having both edges naked: in some species all are simple and naked.) *Corolla:* petals five, obcordate, the length of the calix, inserted into the neck of the calix. *Stamina:* filamenta very numerous, capillary, short, inserted into the neck of the calix; antheræ three-cornered. *Pistil:* germina numerous, in the bottom of the calix; styles as many, villose, very short, compressed close by the neck of the calix, inserted into the side of the germen; stigmas blunt. *Pericarp:* none; berry fleshy, turbinate, coloured, soft, one-celled, crowned with the rude segments, contracted at the neck, formed from the tube of the calix. *Seeds:* numerous, oblong, hispid, fastened to the inner side of the calix. *Observe.* The calix of the pericarp resembles a berry. Essential Character. *Calix:* pitcher-shaped, five-cleft, fleshy, contracted at the neck. *Petals:* five. *Seeds:* very many, hispid, fastened to the inner side of the calix.——The species are,

* *With subglobular Fruits.*

1. Rosa Berberifolia; *Barberry-leaved Rose.* Fruits globular, with the peduncles prickly; stem with prickles, usually in pairs, hooked; leaves simple, subsessile.—Native of northern Persia. This species is remarkable for its simple leaves, which are obovate, glaucous, coarsely serrated, about an inch long, smooth, on short stalks, without stipules, having in their stead a pair of recurved prickles, spreading from the base of each footstalk.——Of the various kinds of Roses it is difficult to determine which is a species, and which a variety. The habit is invariably shrubby, and almost universally prickly; the branches round; leaves alternate, pinnate, with an odd leaflet, serrated, frequently prickly or glandular; flowers terminal, stalked, usually red, variously and deliciously fragrant; fruits harmless, but seldom pleasant. The seeds are slow in germination. Most of them are of foreign growth, and have been at various times introduced into English gardens, but they are generally natives of northern countries, or grow upon the cold mountains in the warmer parts of Europe; so that they are very hardy in respect to cold, but love an open free air, especially the Yellow Rose, the Austrian Rose, and the Monthly Rose.—All the sorts may be propagated either from suckers, layers, or by budding them upon stocks of other sorts of Roses, which latter method is only practised for some peculiar sorts that do not grow very vigorous upon their own stocks, and send forth suckers very sparingly, or where a person is willing to have more sorts than one upon the same plant: but, where this is designed, it must be observed to bud only such sorts upon the same stock as are nearly equal in manner of growth; for if there be a bud of a vigorous sort, and others of weak growth, budded in the same stock, the strong one will draw all the nourishment from the weaker, and entirely starve them. When propagated by suckers, they should be taken off annually in October, and transplanted out, either into a nursery in rows, (as has been directed for several other sorts of flowering shrubs,) or into the places where they are to remain; for if they are permitted to stand upon the roots of the old plants more than one year, they grow woody, and do not form so good roots as if planted out the first year, so there is more danger of their not succeeding. But the best method to obtain good-rooted plants is, to lay down the young branches in autumn, which will take good root by the autumn following, (especially if they are watered in very dry weather,) when they may be taken from the old plants, and transplanted where they are to remain. The plants which are thus propagated by layers are not so apt to send out suckers from their roots, as those which are raised from

suckers; and should be preferred before them, because they may be much easier kept within compass, and these will also flower much stronger. These plants may be transplanted any time from October to April; but when they are designed to flower strong the first year after planting, they should be planted early. Most of the species delight in a rich moist soil and an open situation, in which they will produce a greater quantity of flowers, and those much fairer than when they are upon a dry soil or in a shady situation. The pruning which they require is only to cut out their dead wood, and take off all the suckers, which should be done every autumn; and if there are any very luxuriant branches, which draw the nourishment from the other parts of the plant, they should be taken out or shortened, to cause them to produce more branches, if there be occasion for them to supply a vacancy: but you must avoid crowding them with branches, which is as injurious to these plants as to fruit-trees; for if the branches have not equal benefit from the sun and air, they will not produce the flowers so strong nor in so great plenty, as when they are more open, and better exposed to the sun, that the air may freely circulate between them. For further particulars, see the nineteenth species.

2. Rosa Lutea; *Single Yellow Rose.* Fruits globular, with the peduncles smooth; calices and petioles spinulose; prickles of the branches straight; stalks closely armed with short crooked brown prickles. The *Austrian Rose*, which is a variety of this species, has the stalk, branches, and leaves, like those of the Single Yellow Rose, but the leaves are rounder and the flowers larger, and are either scentless or disagreeable. These two sorts of Rose seldom shoot so strong as most other sorts, especially in the light land near London: they are esteemed for their colour only, being very different from all other Roses.—Native of Germany and Italy.

3. Rosa Sulphurea; *Double Yellow Rose.* Fruits globular; petioles and stem prickly; prickles of the stem of two sorts, larger, with numerous smaller ones; leaves oval. This differs from the preceding, not only in the doubleness of the flowers, but in having the leaflets simply serrate, not glandular, pubescent and glaucous underneath, whereas in the second species they are doubly serrate, glandular, and glutinous, and of a shining green colour; the stipules lacerated; the fruits hemispherical and glandular, which in this are subglobular and smooth. The flowers are a rich, but delicate golden yellow.—See the first species.

4. Rosa Blanda; *Hudson's Bay Rose.* Fruits globular, smooth; the stems, when adult, even and unarmed. Flowers solitary, moderately large, crimson. It flowers from May to August.—Native of Newfoundland and Hudson's Bay.

5. Rosa Cinnamomea; *Cinnamon Rose.* Fruits globular, with the peduncles smooth; stem with stipular prickles; petioles mostly unarmed. This rises four feet high: the branches are covered with a purplish smooth bark, and have no spines; the flowers small, of a purplish blush-colour, with a scent like Cinnamon, whence the name.—It is a native of the south of Europe. The shoots of the Double Cinnamon Rose are redder; the flowers small, short, thick, and double, of a pale red colour at the end of the leaves, somewhat redder and brighter towards the middle. It flowers in May, and is the earliest and smallest of the Double Garden Roses. The root creeps much.—See the first and nineteenth species.

6. Rosa Arvensis; *White Dog Rose.* Fruits globular, with the peduncles unarmed; prickles of the stem and petioles hooked; flowers subcymed. This has round, glaucous, and often mahogany-coloured stems, with very long thong-like branches, bowing with scattered hooked prickles, which are smaller than those in the Rosa Canina, and the flower is always white and scentless.—Native of England, Switzerland, and Germany, Dauphiny, Piedmont, and probably other parts of Europe. With us it is frequent in hedges and thickets, flowering in June and July, and is said to be common in the west of Yorkshire, and about Manchester.

7. Rosa Pimpinellifolia; *Small Burnet-leaved Rose.* Fruits globular, with the peduncles smooth; prickles on the stem scattered, straight; petioles rugged; leaflets blunt. This is a very elegant shrub, a foot and half or two feet high. It flowers here in May and June.—Native of the south of Europe, and Asia.

8. Rosa Spinosissima; *Scotch Rose.* Fruits globular, smooth; peduncles smooth (or hispid;) prickles on the stem very numerous, straight, bristle-shaped; leaflets roundish, smooth; petals white or cream-coloured, yellow at the base, delicately fragrant, sometimes striped with red. The pericarp is full of a fine purple juice, which, Dr. Withering informs us, when diluted with water, dyes silk and muslin of a peach colour, and, with the addition of alum, a deep violet; but adds, that it has little effect on woollen or linen. He remarks, that the ripe fruit is eaten by children, and has a grateful subacid taste; and the singular elegance of its little leaves, resembling those of the Upland Burnet, entitle it to a place in the flower garden. There are several varieties.—Native of most parts of Europe: in Great Britain it is found on the borders of fields, on heath and downs, in hedges, and on ditch-banks, on a gravelly or sandy soil.—This is the lowest of all the species, and ought to be placed among other shrubs of the same growth, which should have a moist soil and shady situation. See the first species, for further directions.

9. Rosa Parviflora; *Small-flowered American Rose.* Fruits globular, depressed, with the peduncles hispid; petioles subpubescent, somewhat prickly; stem smooth; stipular prickles straight; leaflets elliptic; flowers mostly in pairs. This very much resembles the two following species, but differs in having the stem two feet high, the petioles hairy at top, and the flowers in pairs. There is a variety of it with a double flower.—Native of North America.

10. Rosa Lucida; *Shining-leaved American Rose.* Fruits globular, depressed, with the peduncles subhispid; petioles smooth, somewhat prickly; stem smooth; stipular prickles straight; leaflets oblong, elliptic, shining, smooth; flowers on short peduncles, solitary, a little smaller, and of a deeper red than those of the Common Wild Rose, and smelling sweet like the Damask Rose.—Native of North America. See the first and nineteenth species, for its propagation.

11. Rosa Carolina; *Carolina Rose.* Fruits globular, with the peduncles subhispid; petioles hairy, somewhat prickly; stem smooth; stipular prickles somewhat hooked; leaflets oblong-lanceolate; flowers corymbed.—It flowers late; and is a native of North America, in swamps, &c.

12. Rosa Villosa; *Apple Rose.* Fruits globular, with the peduncles hispid; prickles on the stem straightish; leaflets elliptic, tomentose on both sides; corolla of a full rose colour, not very odoriferous. Retzius informs us, that a large variety of it, brought from Holland, and planted in a fertile soil, produced fruit that was quite smooth; and then being transplanted into a worse soil, the fruit became very hispid.—This species is well known in gardens and plantations both in a single and double state, and occurs in many parts of Europe and Asia. It grows copiously in Westmoreland, Cumberland, and the north of Yorkshire, as well as in some parts of Scotland; as in the way from Edinburgh to Ravelston wood; about Killin in Breadalbane; and upon the coast of Fife. The large deep red fruit remains till eaten by birds, or destroyed by frost and wet. A pleasant acid pulp surrounds

the seeds, which is sometimes made into a conserve or sweetmeat, and served up in desserts. See the first and nineteenth species for its propagation.

13. Rosa Rugosa; *Wrinkled-leaved Rose.* Fruits globular, smooth; peduncles, stem, and pedicels, prickly; leaves tomentose underneath.—Native of Japan.

14. Rosa Provincialis; *Provence Rose.* Fruits roundish; peduncles and petioles hispid; prickles of the branches scattered, somewhat bent back; leaflets ovate, villose underneath; serratures glandular. The stems are usually three or four feet high, straight, very prickly; and the flowers two, three, or more, at the top of each branch, very fragrant, and a bright crimson hue, with brown stains on the backs of the outer petals. It is one of the most beautiful sorts yet known; the flowers are sometimes very large, and the petals closely folded over each other like Cabbages; whence it is called the *Cabbage Rose.*—There are several varieties: as, the *Red Provence Rose*, with smaller flowers, of a damask or blush colour turning to red, less productive than the Damask Rose. The *Blush Provence Rose*, the corolla of which has five or six rows of large petals, which spread open, and are of a pale blush colour, with a musky scent. The *White Provence Rose*, with colourless flowers. And the two *Dwarf Provence Roses*, the smallest of which is often called *Pompone Rose:* it throws out numerous stems, of a foot and half in height; and the flowers are very small, and distinguished by the brilliant colour of the central petals. They appear in June. —These elegant varieties may be increased, like most of the other species, by suckers, which however are not very plentifully produced, and do not extend to any great length. The roots should not be divided oftener than once in three years: if the old wood be cut down every year after the plants have done blowing, they will throw out more vigorous shoots, and flower more freely.

15. Rosa Lyonii. Germina subglobose, slightly glabrous; peduncles hispid; petioles subaculeate; stem glabrous; prickles scattered, straight; leaflets from three to five, ovate-oblong, acute, serrate, slightly glabrous on the upper side, tomentose underneath; upper leaves simple, small, with coloured veins; flowers subternate, pale red; stipules linear; segments of the calix tomentose, linear, very slightly laciniated.—Grows in Tennessee.

16. Rosa Setigera. Germina globose; petioles and nerves aculeate; boughs glabrous; prickles in pairs, scattered; leaflets from three to five, acuminate, glabrous; leaflets of the calix setigerous.—This plant is found in the swamps of Virginia and Lower Carolina, from five to eight feet high.

17. Rosa Rubifolia. Germina and fruit-stalks slightly hispid; calix beardless; leaves ternate, pubescent underneath; petioles glandulous, aculeate; stem glabrous; prickles stipular and scattered, subaduncous; flowers corymbose.—Grows in North America.

** *With ovate Fruit.*

18. Rosa Centifolia; *Hundred-leaved Rose.* Fruit ovate, with the pedicels hispid, prickly; petioles unarmed. Stem hispid, and finely prickly; leaflets ovate, hairy beneath. The petals are so closely wedged together, that the flower appears as if it came out of the hand of the turner. The varieties are very numerous; and differ chiefly in the disposition of their richly multiplied, though diminished, petals; and are many of them very beautiful, from their fulness and neatness of figure: their colours are different shades of crimson, verging to pink, or to a blueish purple. The most remarkable are: 1. the Dutch Hundred-leaved Rose; 2. the Blush Hundred-leaved Rose; 3. Singleton's Hundred-leaved Rose; 4. the Burgundy Rose; 5. the Single Velvet Rose; 6. the Double Velvet Rose; 7. the Sultan Rose; 9. the Stepney Rose; 10. the Garnet Rose; 11. the Bishop Rose; and, 12, the Lisbon Rose. They have all less scent than the ordinary Red Rose, and there are several of more modern date. The Burgundy Rose is an elegant little plant, not more than a foot or eighteen inches in height. Its numerous varieties are common in gardens throughout Europe, blooming in June and July. The Hundred-leaved Rose is improperly confounded with the Damask Rose, in the *Dublin Pharmacopœia.* The petals, which are of a pale red colour and of a very fragrant odour, are directed for medical use. The smell is very agreeable to most persons; but when too powerful, arising from large quantities of the flowers, is found to produce violent sneezing, inflammation of the eyes, fainting, hysterical affections, &c. Persons confined in a close room with a great heap of Roses, have been in imminent danger of their lives. From experiments made by able chemists, this effect seems owing to the mephitic air which these and other odoriferous flowers exhale. Six pounds of fresh roses, by distillation, strongly impregnate a gallon of water with their fine flavour. On distilling large quantities, there separates from the watery fluid a small portion of a fragrant butyraceous oil, which liquifies by heat, and appears yellow, but concretes in the cold into a white mass: only half an ounce of oil could be extracted from a hundred pounds of the flowers. The smell of this oil exactly resembles that of the roses, and is therefore used as a perfume: it possesses very little pungency, and has been highly recommended for its cordial and analeptic qualities.—The process for making atto, or essential oil of roses, is as follows: Forty pounds of fresh roses, with their calices, are put into a still with sixty pounds of water. The mass being well mixed, a gentle fire is put under the still; and when fumes begin to rise, the cap and pipe are properly fixed and luted. When the impregnated water begins to come over, the fire is lessened by gentle degrees, and the distillation continued till thirty pounds of water are come over, which is generally in four or five hours. This water is to be poured upon forty pounds of fresh roses, and from fifteen to twenty pounds of liquor to be drawn from it as before. It is then poured into pans of earthenware or tinned metal, and left exposed to the fresh air for the night; and in the morning the atto, or essence, will be found swimming congealed on the surface of the water.—These flowers also contain a bitterish substance, which is extracted by water along with the odorous principle, and remains entire in the decoction after the latter has been separated by distillation or evaporation. This fixed sapid matter of the petals manifests a purgative quality, and it is on account of it that the flowers are received into the materia medica. A syrup prepared from this Rose is found to be a pleasant and useful laxative for children, or to obviate costiveness in adults. The proper dose is a spoonful.

19. Rosa Gallica; *Red Rose.* Fruits ovate, with the peduncles hispid; stem and petioles hispid, prickly. The flowers are large, but not very double; have a deep red colour, with an agreeable scent; but soon decay. Linneus rests the specific difference between this and the preceding species, on the greater roughness and prickliness of the leaf-stalks in this. The petals are large and spreading, but never half so numerous as in the other. This species has obtained the name of *English Rose*, because this and the White are the most ancient roses known in our country, and have been assumed by our kings as cognizances of their dignity, and also because the Red Rose occurs oftener in England, and is more commonly used there, than in other places.—The varieties are the Mundi Rose, which has the flowers very ele-

The Moss Provence Rose.

The York and Lancaster Rose.

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R. Hicks sc.

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gantly striped or variegated with red and white; in other circumstances it so perfectly resembles the Red Rose, that there can be no doubt of its being a variety of that; indeed it frequently happens that a Red Rose or two appears on the same plant with the variegated flowers. The varieties called Childing, Marble, and Double Virgin Roses, have, in Mr. Miller's judgment, great affinity with each other. The flowers of this species possess neither the fragrance nor the opening quality of the preceding species; but are chiefly valued for their astringency, which is most considerable before the petals expand, and therefore in this state they are chosen for medical use, and ordered in different preparations, as a conserve, honey, infusion, and a syrup. These preparations, especially the first and second, have been highly esteemed in phthisical cases, particularly by the Arabian physicians. But in all the cases cited, it appears that the use of the conserve of roses was constantly joined with that of milk and farinacea, together with proper exercise in the open air; and hence it has very properly been doubted whether the recovery could be wholly imputed to the roses, though their mild, astringent, and corroborant virtues, certainly contributed much. In some cases, twenty or thirty pounds of the conserve were taken in the space of a month. The infusion is a grateful cooling subastringent, taken for spitting of blood, in which its efficacy chiefly depends on its acidity. The syrup derives its use merely from its colour. Both the acidity and the colour of the petals are best preserved by hasty drying.——The following directions of Mr. Miller relate to many of the other species, and which are referred to this, as well as to the English Rose itself. The usual time of these shrubs producing their flowers, is from the middle or latter end of May till the middle of July. But in order to continue these beauties longer than they are naturally disposed to last, it is proper to plant some of the Monthly Roses near a warm wall, which will occasion their budding at least three weeks or a month before those in the open air; and if you afford them the help of a glass before them, it will bring their flowers much forwarder, especially where dung is placed to the back of the wall, as is practised in raising early fruits. You may also cut off the tops of such shoots as have been produced the same spring, early in May, from some of these sorts of Roses which are planted in the open air and strong soil; this will cause them to make new shoots, which will flower late in autumn, as will also the late removing the plants in spring, provided they do not suffer by drought. The Monthly Rose is the best sort for this purpose, there being no other which will flower so well, both early and late. The next sort of Rose which flowers in the open air, is the Cinnamon, which is immediately followed by the Damask Rose; then come the Blush, York and Lancaster; after which the Provence, Dutch Hundred-leaved, and White, and most other sorts, follow. The latest kinds are the Virginian and Musk Roses, which, if planted in a shady situation, seldom flower until September, and, if the autumn prove mild, will often continue till the middle of October. The plants of the two sorts of Musk Roses should be placed against a wall or pale, to support their slender and weak branches from trailing on the ground. Their branches should not be pruned until spring, for they often die after being cut in winter. They produce their flowers at the extremities of the same year's shoots in large bunches; so that their branches must not be shortened in the summer, lest the flowers should be cut off. They will grow to ten or twelve feet high, and must not be checked in their growth, if you intend they should flower well.—See the first species, for further particulars.

20. Rosa Damascena; *Damask Rose.* Calices semipinnate; fruits ovate, turgid, with the peduncles hispid; stem and petioles prickly; leaflets ovate, acuminate, villose underneath. The corolla is of a soft pale red, and not very double; the hips are long and smooth. There are many varieties of this elegant plant, which has not been accurately distinguished from the fourteenth and nineteenth species. The Red and Blush varieties differ only in the shade of their colour; The York and Lancaster Rose differs only in the flower being variegated with white stripes; the Red and White Monthly Roses, are so called from their continuing to blow in succession during the greatest part of the summer, not that they blow in every month, as the name implies; the Blush Belgic Rose has very double flowers of a pale flesh-colour, with little scent, generally in great quantities; and the Red Belgic Rose differs only in having the colour of the flower a deep red.—See the first and nineteentn species, for the proper treatment of these flowers.

21. Rosa Sempervirens; *Evergreen Rose.* Fruits ovate; calices and peduncles hispid; stem and petioles prickly; flowers subumbelled; bractes lanceolate, reflex. Parkinson remarks, this Rose-bush is very like the Wild Single Eglantine; and that the lowest pair of leaflets are the smallest, the next bigger, the third bigger still, and the end leaf biggest of all. The flowers are small, single, and white, having a musky odour. In their natural place of growth they continue in succession a great part of the year, but they flower here in June.—Native of Germany.

22. Rosa Pumila; *Dwarf Austriau Rose.* Fruit ovate, with the peduncles hispid; petioles and stem prickly; leaves glaucous underneath, with the serratures glandular.—Native of Austria and Italy.

23. Rosa Turbinata; *Frankfort Rose.* Fruits turbinate, with the peduncles hairy; petioles villose; prickles scattered, recurved. The flower is as thick and double as a Red Rose, but so strongly swelling in the bud, that many of them break down before they can be full blown; and then they are of a pale red rose colour, between a red and a damask.—Native place unknown. Its principal use is for a stock to bud the more tender sorts of Roses upon, for the flowers seldom open fair, and have no scent; but it being a vigorous shooter, renders it proper for stocks to bud the Yellow and Austrian Roses, which will render them stronger than upon their own stocks. It requires a northern exposure, and will not flower in too warm a situation.

24. Rosa Rubiginosa; *Common Sweet-Briar*, or *Eglantine.* Fruits obovate, with the peduncles hispid; petioles and stem prickly; prickles recurved; leaves ovate, glandular, hairy underneath. The garden shrub grows larger, and more erect; the leaves are bigger and much sweeter, than in the wild one, the rusty colour of them disappears, and the whole puts on a more vigorous appearance. There are varieties with double flowers; as the Common Double Sweet Briar, the Mossy Double Sweet Briar, the Evergreen Double Sweet Briar, the Marbled Double Sweet Briar, the Red Double Sweet Briar, the Royal Sweet Briar, and the Yellow Sweet Briar; all very elegant shrubs in ornamental plantations. It makes beautiful and fragrant, though not long-lived hedges; and bears forcing well.

25. Rosa Muscosa; *Moss Provence Rose.* Fruits ovate; calices, peduncles, petioles, and branchlets, hispid, glandular, viscid; spines of the branches scattered, straight. The flowers are of a beautiful crimson colour, and have a most agreeable odour. The peduncles and calix are covered with a long hair-like Moss; hence it is commonly called the Moss Rose.—It is only known to us in its double state, its native

place not having been discovered. It rarely sends up suckers, and when the branches are laid down, they are long before they put out roots; it is therefore frequently propagated by budding it upon stocks of the other sorts; but the plants so raised are less durable than those propagated by layers, which is the method generally adopted.

26. Rosa Moschata; *Musk Rose.* Fruits ovate, with the peduncles villose; stem and petioles prickly; leaflets oblong, acuminate, smooth; peduncles many-flowered. The flowers are rather small, white, exceedingly numerous, in large terminal panicles, and have a fine musky odour: they appear in July and August, and continue in succession till the frost stops them. It varies with double flowers.—Said to be indigenous in Spain. See the first and nineteenth species.

27. Rosa Rubrifolia; *Red-leaved Rose.* Fruits ovate, with the peduncles smooth and glaucescent; petioles prickly; stem with scattered uncinate prickles; leaflets oblong, finely serrate, smooth; flowers subcorymbed. The veins of the leaves underneath are red. The stem, peduncles, and fruits, are covered with a glaucous bloom.—Native of the mountains of Dauphiny, Switzerland, and Saltzburgh.

28. Rosa Lagenaria; *Bottle-fruited Rose.* Fruits obovate, smooth; peduncles and petioles glandular, hispid; stem unarmed; leaflets oval, smooth.—Native of Dauphiny, &c.

29. Rosa Alpina; *Alpine Rose.* Fruits ovate, smooth; peduncles and petioles hispid; stem unarmed; flowers single, bright, appearing at the beginning of May; and succeeded by long, smooth, spear-shaped hips. They produce a second crop of flowers about the end of August, which fall off, and are not succeeded by hips.—Native of the Alps, Germany, Piedmont, and Siberia.

30. Rosa Pyrenaica; *Pyrenean Rose.* Fruits ovate, with the peduncles hispid, coloured; petioles hispid, prickly; calices altogether leafy.—Native of the Pyrenees, the Swiss Alps, and the mountains of Silesia.

31. Rosa Pendulina; *Smooth Pendulous Rose.* Unarmed: fruits oblong, pendulous; peduncles and petioles hispid; stem and branches smooth. It flowers earlier than other Roses, namely, in May, and ripens its fruit in August.—Native of North America.

32. Rosa Montana; *Mountain Rose.* Fruits oblong, with the peduncles hispid; petioles prickly; stipular, hooked prickles on the stem; leaflets smooth, obovate, glandular, serrate.—Native of the mountains of Switzerland.

33. Rosa Multiflora; *Bramble-flowered Chinese Rose.* Fruits ovate, with the peduncles unarmed, villose; stem and petioles prickly.—Native of Japan and China. It is hardy, flowering in June and July, and a great acquisition to the gardens, being a shrub of luxuriant growth, and easily trained to a considerable height. The flowers are in clusters, the petals pink.

34. Rosa Canina; *Dog Rose, Wild Briar,* or *Hip Tree.* Fruits ovate, with the peduncles smooth; prickles on the stem hooked; leaflets ovate-acuminate, very smooth; branches elongated, from upright spreading; petals obcordate, a little remote, pale red, fainter towards the base, sometimes white, sweet-scented.—Native of Europe, in hedges and woods, decorating them with its lively odorous flowers in the months of June and July. From the flowers a perfumed water may be distilled, which is said to be much more fragrant than that from garden Roses. The leaves are recommended as a substitute for Tea, giving out a fine colour, a subastringent taste, and a grateful smell, when dried and infused in boiling water. The fruit commonly known by the name of Hips, is agreeable enough when ripe and mellowed by the frost: beaten up with sugar, it makes a pleasant conserve, more used as a vehicle for other medicines than for any virtue of its own. Care should be taken, in making this conserve, to remove all the chaffy or prickly fibres or bristles with the seeds, which will otherwise produce considerable irritation on the primæ viæ. A mossy protuberance is common on various parts of the Wild Rose, which is occasioned by an insect called *Cynips Rosæ.* Birds seek after the fruit in winter, the pheasant especially being very fond of them. Its strong thorns make it valuable for strengthening hedges.

35. Rosa Tomentosa; *Downy-leaved Dog Rose.* Fruits ovate, with the peduncles hispid; prickles on the stem hooked, leafless, ovate, tomentose on both sides. This agrees in habit with the preceding species, except that the leaves are pubescent all over, and have a subcinereous appearance; petals whitish at the base, but the rest of a beautiful rose colour.—Not uncommon in hedges and thickets in England; flowering in June and July.

36. Rosa Collina; *Rough-stalked Dog Rose.* Fruits ovate, smoothish; peduncles and petioles glandular, hirsute; stem prickly. This very much resembles the *Rosa Canina* in habit.—Native of the hills of Austria.

37. Rosa Parvifolia; *Small-leaved Rose.* Fruits ovate, smoothish; peduncles glandular; petioles and stem with very fine prickles; leaflets wrinkled, somewhat villose underneath, ovate, glandular, serrate. This is a very small shrub, with small flowers.—Native of Europe.

38. Rosa Semperflorens; *Deep-red China Rose.* Fruits oblong, with the peduncles hispid; stem and petioles prickly, hispid; leaves subternate, prickly; flowers large in proportion to the plants, semi-double, with great richness of colour, (dark red) uniting a most delightful fragrance.—They come out in succession during the winter months.—Native of China.

39. Rosa Chinensis; *Pale China Rose.* Fruits ovate, with the peduncles smooth; petioles and stem prickly; leaflets ovate-lanceolate, subternate, serrulate, smooth. This is very nearly allied to the preceding, and perhaps may be only a variety.—Native of China.

40. Rosa Indica; *Indian Rose.* Fruits ovate, with the peduncles smooth; stem almost unarmed; petioles prickly. —Native of China and the East Indies.

41. Rosa Longifolia; *Long-leaved Rose.* Fruits ovate, smooth; peduncles glandular-subaculeate; stem almost unarmed; petioles prickly; leaflets smooth, ovate-acuminate.—Native of the East Indies.

42. Rosa Bracteata; *Bracted Rose.* Fruits obovate; peduncles bracted, with the branchlets villose; stem and petioles prickly; leaflets smooth, roundish, crenate, somewhat prickly. Flowers cream-coloured, fragrant, terminating, solitary.—Native of China.

43. Rosa Alba; *White Garden Rose.* Fruits ovate, smooth; peduncles hispid; stem and petioles prickly; leaflets roundish-ovate, sharply serrated, downy beneath. Parkinson describes two varieties of the White Garden Rose, one sometimes attaining the height of eight or ten feet, with a very large stock, the other seldom higher than a Damask Rose. Both have somewhat smaller and whiter green leaves than many other Roses, five most usually in a stalk, and paler underneath; as also a whiter green bark armed with short prickles. The flowers in the one are whitish with an eye of blush, especially towards the bottom, very double, and for the most part not opening so fully as the Red or Damask Roses; in the other, more whiteness, double, and opening more. Some have only two or three rows of petals, and all have little or no smell. It is nearly allied to *Rosa Gallica.*—Native of Europe, China, and Cochin-china.

44. Rosa Lævigata Germina ovate, very hispid; seg-

ments of the calix entire; prickles in pairs, recurved; petioles subaculeate; leaflets from three to five, lanceolate-oval; stipules narrow, subulate-mucronate.—Grows in the shady woods of Georgia. This plant is an everlasting green, climbing to a great height.

45. Rosa Suaveolens. Germina ovate; peduncles and petioles glandulous-hispid; petioles subaculeate; stem glabrous; prickles scattered, straight, fine; folioles from five to seven, ovate, serrate; branchlets uniflorous; segments of the calix entire.—An American species.

Rose Bay. See *Nerium Oleander.*

Rose Campion. See *Agrostemma Coronaria.*

Rose, Guelder. See *Viburnum Opulus.*

Rosemary. See *Rosmarinus.*

Rose of Jericho. See *Anastatica.*

Rosmarinus; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, compressed above; mouth upright, two-lipped; upper lip entire, lower bifid. *Corolla:* unequal; tube longer than the calix; border ringent; upper lip two-parted, upright, shorter, acute, with the edges bent back; lower lip bent back, trifid: the middle segments very large, concave, narrow at the base; the lateral ones narrow, acute. *Stamina:* filamenta two, awl-shaped, simple, with a tooth inclined towards, and longer than the upper lip; antheræ simple. *Pistil:* germen four-cleft; style of the same figure, situation, and length with the stamina; stigma simple, acute. *Pericarp:* none, except the permanent calix, containing four ovate *seeds* at the bottom. *Observe.* This genus approaches very near to that of *Salvia*, and is distinguished by not having the stamina at all forked. Essential Character. *Corolla:* unequal, with the upper lip two-parted. *Filamenta:* long, curved, simple, with a tooth.——The species are,

1. Rosmarinus Officinalis; *Officinal Rosemary.* Leaves sessile. An erect, evergreen shrub, about four feet high, very much branched; branches obscurely quadrangular, downy, leafy on all sides; leaves opposite, smooth, dark green, and shining above, downy and veined beneath; flowers axillary, terminal, on short stalks, erect, of a bright blue colour variegated with purple and white, having, like the leaves, a strong aromatic fragrance resembling camphor.—Native of the south of Europe: common in gardens, flowering in May. There are several varieties. The leaves of the wild sort are broader than those of the Garden Rosemary, and have blunter points; the flowers also are much longer and of a deeper colour. The variety with striped leaves, is called by the gardeners Silver Rosemary; and the yellow-striped-leaved sort, Golden Rosemary. The former is tender, though the latter is pretty hardy, and will survive our common winters in the open air upon a dry soil. Rosemary has a fragrant aromatic smell, and a bitterish pungent taste. The leaves and tops are strongest in their sensible qualities; the flowers ought not to be separated from their calices, the active matter residing principally, if not wholly, in the latter. This herb yields its qualities completely to rectified spirit, but only partially to water. The leaves and tops distilled with water, yield a thin, light, pale, essential oil, of great fragrancy, though not quite so agreeable as the Rosemary itself. From one hundred pounds of the herb in flower, eight ounces of oil have been obtained. The decoction thus divested of the aromatic part of the plant, yields, on being inspissated, an unpleasant bitterish extract. Rectified spirit, likewise distilled from Rosemary leaves, becomes considerably impregnated with their fragrance; leaving, however, in the extract the greatest share both of their flavour and pungency. The active matter of the flowers is somewhat more volatile than that of the leaves, the greatest part of it arising with spirit. Rosemary is reckoned one of the most powerful of those plants which stimulate and strengthen the nervous system: it has therefore been recommended in various affections, supposed to proceed from debilities, or defective excitement of the brain and nerves; as in certain kinds of headache, deafness, giddiness, palsies, &c. and in some hysterical and dyspeptic symptoms. It has the character of being an emmenagogue. It is a principal ingredient in what is known by the name of Hungary Water; and the herb is taken as Tea by many persons for headaches, and what are truly called *nervous* disorders. The officinal preparations are the Essential Oil and the Spirit of Rosemary. The ancients were well acquainted with this shrub, which has always been supposed to strengthen the memory. Hence the frequent allusions to it in our poets; as in Shakspeare,

"There's Rosemary, that's for remembrance."

On this account it became the emblem of fidelity in lovers, and was worn at weddings; and probably for the same reason at funerals, at which, in some parts of England, it is still distributed among the company, who frequently throw the sprigs into the grave along with the corpse.—*Culture.* This plant thrives prodigiously upon dry rocky soils near the sea, in the south of France, Spain, and Italy. It is hardy enough to bear the cold of our ordinary winters in the open air, provided it be planted upon a poor dry gravelly soil, or near a wall. It may be increased by layers, or by planting slips or cuttings in the spring, just before the plants begin to shoot, upon a bed of light fresh earth; when they are rooted, transplant them where they are to remain, about the beginning of September, that they may take new root before the setting in of the frosty weather. If they are not transplanted thus early, let them remain unremoved till March following; observing to transplant them in mild showery weather. They will then require no further care, but to keep them clear from weeds. When accidentally rooted in a wall, these plants will endure the greatest cold of our winters, however exposed to cold winds. The varieties with striped leaves are somewhat tender, especially that with silver stripes. These therefore should either be planted by a warm wall, or in pots filled with light fresh earth, and sheltered in winter under a frame.

2. Rosmarinus Chilensis; *Chili Rosemary.* Leaves petioled.—Native of Chili, flowering in July.

Rot, Dry. A disease in timber, the existence of which is principally known by the appearance of fungi on the surface of the wood, which are followed by an entire decomposition and decay of all its component parts. Many of our ships of war, after having been constructed at an immense expense, have been rendered entirely useless by the appearance of this fatal defect in the timber of which they were built. Writers are not agreed as to the cause of the evil; but we shall here present our readers with the opinion and advice of an ingenious gentleman, who seems thoroughly to have studied this important subject. As I consider, says Mr. Robert Dodd, all methods for curing timber already infected futile, I shall endeavour to shew how timber may be procured so as to be able to resist its attacks. I take the felling of timber at an improper season, to be the predisposing cause; the presence of water and of heat, the operating and stimulating causes of the process. At that time of the year when timber is now felled, it is full of the sap and peculiar juices; it is in the full vigour of vegetation; turgid with the abundance of its various juices, the vessels are distended to their utmost capacity, and the tree is less solid than at any other time of the year. It is cut down in this state; a quantity of

its juices flow out, but a much larger quantity is retained in its vessels, and cannot be expelled. Long, very long seasoning after the usual method, is requisite to deprive them of their vegetating powers; and when that is affected, the timber is neither so strong nor so durable as that felled in the autumn or winter. Mr. Knight has shewn, that winter-felled timber is more dense than that which is cut in the spring or early part of summer. He cut two Oak poles from the same stool, the one in May, the other after leaf-fall; these were dried for six weeks by a fire; he then found the specific gravity of the winter-felled to be 0.679, that of the summer, 0.609. Here then is a decisive proof of the superior quality of winter-felled timber. At the end of autumn, the tree has completed its vegetation; the sap and peculiar juices no longer exist in it as such, but are changed into wood and other solid matter, and in consequence are not so much disposed to decomposition, as they were when in a state of fluidity; the water is nearly gone, and the wood, as if so designed by nature, is fit for cutting, being in a state of suspended animation, which state, I suppose, may be prolonged by cutting off the sources of future vivification. I have noticed Elm trees which were cut down in spring, germinating the succeeding spring; and, on rending away part of the bark, have found the sap in circulation: had these trees been cut, and converted to use, I have no doubt that instead of finding a branch, I should have seen a fungus. From the above I draw the conclusion, that the spring is an improper time to fell timber, and that its being loaded with juices disposes it to a hasty decay. It will be objected to the plan of cutting timber in the autumn and winter, that the bark will be ruined. It has been proved, that trees have continued to grow and flourish when deprived of a great part of that covering; it will be of no injurious consequence to the tree, then, to strip it of its bark at the most convenient time, and suffer the tree to remain until autumn to complete its vegetation, taking care to envelope the trunk with hay or straw bands, so as to defend the sap-vessels from the sun and wind. But, even supposing the growth of the tree should be affected by these means, yet it will be the external part alone that will suffer, and that is of but trifling consequence, as, in the conversion of timber for shipping especially, that part is cut away. By these means, the timber may be procured free from sap, and the peculiar juices, to which fluids the fungi owe their origin; for, upon analysis of it, I found they yielded most of the principles of which the peculiar juices are composed: therefore procure timber free from those two fluids, and fungi will be prevented. At the end of autumn, a small portion of water will remain in the tree, and, in conveying it to the various places at which it is to be used, more will necessarily be absorbed. To expel this, and to season the timber, the logs should be first sided or cut out into their different qualifications, and then placed in sheds constructed for that purpose, of large capacity, and with sides of swinging loover boards; in these must be placed stoves, the funnels of which should run through the whole length of the building, and be capable of raising their atmosphere to a temperature between 98 and 100, when some of the lower boards are canted to admit a current of air; those to windward should be canted below, and those to leeward aloft: care must be taken that the current of air be not very rapid. In a few weeks, the timber will be fit to be removed to other buildings of the same construction, but without stoves; and thus it may in a short time be rendered fit for use, well seasoned, and of greater durability and strength than that at present used.

Rot, Red. See *Drosera Rotundifolia.*

Rot, White. See *Hydrocotyle Vulgaris.*

Rotala; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, membranaceous, three-toothed, permanent. *Corolla:* none. *Stamina:* filamenta three, capillary, the length of the calix; antheræ roundish. *Pistil:* germen superior, ovate; style filiform; stigma trifid. *Pericarp:* capsule ovate, subtrigonal, inclosed within the calix, three-celled, three-valved. *Seeds:* very many, roundish. Essential Character. *Calix:* three-toothed. *Corolla:* none. *Capsule:* three-celled, many-seeded.——The only known species is,

1. Rotala Verticillaris. Leaves in fours, sometimes on the branches from five to eight, sessile, linear, sharpish, even, somewhat keeled, spreading; flowers in fours, one from each axil of the leaves, sessile, small; stem asending, a palm high, round, jointed, even.—Native of the East Indies.

Rotang. See *Calamus.*

Rothia; a genus of the class Syngenesia, order Polygamia-Æqualis.—Generic Character. *Calix:* common rounded, villose-tomentose; scales about seven, equal, linear, acute. *Corolla:* compound imbricate, uniform; corollets hermaphrodite, numerous, equal; proper, one-petalled, ligulate, linear, truncate, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* germen ovate; style filiform, the length of the stamina; stigmas two, reflex. *Pericarp:* none; calix converging. *Seeds:* solitary; in the disk, cylindric, turbinate, striated, with a capillary down, feathered below, and sessile; in the ray, cylindrical, striated, wrapped up in chaffs without any down. *Receptacle:* flat, in the disk hairy, in the ray chaffy; chaffs in several rows, linear, channelled, erect, sharpish, tubular at the base; outer the length of the calix, inner gradually shorter. *Observe.* This genus is very nearly allied to *Andryala.* Essential Character. *Receptacle:* in the ray chaffy; in the disk villose. *Calix:* of many equal scales. *Seeds:* in the ray bald; in the disk pappose.——The only species are,

1. Rothia Andryaloides. Stem much branched from the very base; leaves ovate-lanceolate, clasping the stem, nearly entire, downy. Annual.—Native of Spain.

2. Rothia Cheiranthifolia. Stem erect, corymbose; leaves finely woolly, lanceolate, sinuated, or deeply toothed.—Native of Spain and the south of France, flowering in May. Annual.

3. Rothia Runcinata. Stem erect, corymbose; leaves downy; flower-stalks villose, glandular. Biennial.—Native of the south of Europe.

Rottbœllia; a genus of the class Polygamia, order Monœcia; or of the class Triandria, order Digynia.—Generic Character. *Receptacle:* common elongated into the jointed rachis of a cylindrical spike, the joints alternately hollowed out to receive flowers of a two-fold structure; some (in the calix) one-glumed, placed on a thicker tooth, hermaphrodite; others two-glumed, each inserted (alternately) on either side of the former, a little lower down, and a little smaller than the former, female; (hermaphrodites?) In some species only one of this sort. *Hermaphrodite, one-glumed. Calix:* glume one-flowered, one-valved; valve cartilaginous, ovate-oblong, truncate at the base, often emarginate, striated, closing the sinus of the joint, which is in place of a second valve-like lid. *Corolla:* glume two-valved, parallel to and shorter than the calicine glume; valves lanceolate, acute, concave, membranaceous, hyaline; outer longer, inner with the edges bent in; nectary one-leafed, lanceolate, blunt, membranaceous, hyaline, longer than the germen. *Stamina:* filamenta three, capillary; antheræ oblong, bifid at each end. *Pistil:* germen oblong; styles two, filiform; stigmas oblong, feathered,

spreading, standing out. *Pericarp:* none. The sinuses of the joints of the spike, closed by the glume of the calix, contain the seed, until the rachis separates in joints. *Seed:* single, oblong. *Hermaphrodites, two-glumed.—Calix:* glume one-flowered, two-valved, transverse; valves cartilaginous, oblong, mucronate, striated; outer a little shorter, with a short dagger-point. *Corolla:* glume two-valved, transverse; valves lanceolate, membranaceous, shorter than the calix, outer concave, longer, inner with the edges folded together; nectary as in the other, or two-leaved, with the leaflets lanceolate, acuminate. *Stamina:* filamenta three, capillary; antheræ oblong, bifid at each end. *Pistil:* germen oblong or ovate; styles two, capillary. *Stigmas:* oblong, feathered, spreading, standing out. *Pericarp:* none; calix and corolla cherish the seed, fastened to the rachis, which separates in joints. *Seed:* single, ovate or oblong. ESSENTIAL CHARACTER. *Rachis:* jointed, roundish, in most species filiform. *Calix:* ovate-lanceolate, flat, one or two valved; florets alternate, on a flexuose rachis.——The species are,

1. Rottbœllia Incurvata. Spike round, awl-shaped, curved inwards; calicine glume two-valved, awl-shaped, pressed close. Root annual, fibrous, very much branched, elongated. A small annual grass, flowering in July and August.—Native of many parts of Europe, on the sea-coast, and in salt-marshes. In England it occurs near Yarmouth and Sheringham in Norfolk, Wisbeach in Cambridgeshire, Seaton in Durham, below King's Weston near Bristol, and at Exmouth in Devonshire.

2. Rottbœllia Filiformis. Spike round, awl-shaped, subcompressed, erect; calicine glume two-valved, ensiform, spreading. This is more slender than the preceding species: it has a purplish stem, and smaller, rougher, channelled leaves. Perennial.—Native of the south of Europe.

3. Rottbœllia Cylindrica. Spike round, awl-shaped, erect; calicine glumes one-valved. Perennial.—Native of the south of Europe, and of Barbary.

4. Rottbœllia Thomæ. Spike solitary, erect, awl-shaped, imbricate two ways; rachis waved, excavated, but not jointed; flowers hermaphrodite, disposed alternately on the excavations of the rachis. This is the smallest species of the genus, the whole Grass being hardly more than an inch in height.—Named from its being found at St. Thomas's Mount, on old walls, in Tranquebar.

5. Rottbœllia Repens. Spike round, awl-shaped; calicine glume one-valved, undivided.—Native of the South Sea islands within the tropics.

6. Rottbœllia Lævis. Peduncles very long; spikes with flowers in pairs, lateral; calices ovate, undotted, even.—Sent by Kœnig from Tranquebar.

7. Rottbœllia Compressa. Spike compressed, awl-shaped; calicine glume lanceolate, flat, undivided; culms compressed, leafy.—Native of both Indies, and China.

8. Rottbœllia Hirsuta. Spike awl-shaped, hirsute; hermaphrodite florets spreading; barren florets pedicelled, pressed close; culm a foot high or more, striated, alternately excavated at top; flowering branches sometimes several from one joint. Perennial.—Native of Egypt.

9. Rottbœllia Cymbachne. Spikes twin, halved; sheaths of the leaves ciliate. This is a slender Grass, a foot high, with several simple or branched stems.—Native of Bengal.

10. Rottbœllia Cœlorachis. Spike round, one-sided; florets twin, one of them pedicelled; calix two-valved.—Native of the Isle of Tanna in the South Seas.

11. Rottbœllia Dimidiata. Spike halved, compressed, linear; outside aggregate, floscular; inner even, naked. A stout, branched, smooth Grass, with very broad obtuse leaves, whose sheaths, like the stem, are very much compressed.—Native of sandy soils in the East Indies, the Brasils, and also the Cape.

12. Rottbœllia Exaltata. Spike round, filiform, floscular every way; glumes ovate-blunt; sheaths dotted and hirsute.—Native of the East Indies and Cochin-china.

13. Rottbœllia Corymbosa. Spikes aggregate, lateral, filiform; florets bifarious, spreading; leaves ciliate at the base.—Native of the coast of Malabar and New Holland.

14. Rottbœllia Muricata. Spikes several, round, on long peduncles; calices fringed with prickles, the neuters bifid.—Native of the East Indies.

15. Rottbœllia Sanguinea. Spikes of the panicles awl-shaped, alternate, simple, peduncled; the lateral bracte of the flowers ciliate.—Native of China.

16. Rottbœllia Setacea. Spike solitary, awl-shaped, one-ranked, a little curved inwards; rachis excavated, but not jointed; corolla two-valved, membranaceous, hairy.—Native of the East Indies, on old walls.

17. Rottbœllia Monandra. Culms erect; flowers distich, in spikes.—This is an annual Grass, very common about Madrid, flowering in May. At the top of the stem there is always a solitary flower, which beyond the calicine glume bears another almost opposite to that, and much shorter.

Roussea; a genus of the class Tetrandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth four-cleft, smooth; segments tongue-shaped, acute, reflex. *Corolla:* bell-shaped, wrinkled on the outside, subpubescent, half four-cleft; segments acute, revolute. *Stamina:* twice as long as the revolute corolla, and alternate with its segments; filamenta straight, very wide, a little narrower at the top, smooth; antheræ small, sagittate, acute. *Pistil:* germen superior, quadrangularly pyramidal, smooth; style the length of the stamina, permanent; stigmas simple, blunt, umbilicate, depressed, smooth. *Pericarp:* berry quadrangularly pyramidal, one-celled, with a smooth hard coat. *Seeds:* very numerous, small, lens-shaped, nestling. ESSENTIAL CHARACTER. *Calix:* four-cleft. *Corolla:* one-petalled, bell-shaped, four-cleft, inferior. *Berry:* quadrangular, many-seeded.——The only species known is,

1. Roussea Simplex. Leaves opposite, petioled, obovate, acute or subacute, toothed, very smooth on both sides, somewhat fleshy; flowers solitary, axillary, on short peduncles, nodding, large, of a very fleshy substance. This is a small shrub, of a fleshy habit, climbing over trees or rocks.—Found by Commerson in the Mauritius.

Roxburghia; a genus of the class Octandria, order Monogynia.—GENERIC CHARACTER. *Calix:* inferior, four-leaved; leaflets lanceolate, membranaceous, striated, coloured, revolute, immediately below the petals. *Corolla:* petals four, nearly erect, lanceolate, the lower half rather broader than the upper; along the inside runs a deep, sharp, slightly waved keel, forming on each side a deep groove or hollow; the four keels converge, and in some measure adhere together, thus bringing the side of the petals close, and forming a tube; the upper part of the petals is narrower, bending out a little, and then their points bend in; nectary composed of four lanceolate yellow bodies, each sessile on the apex of the keel of the parts, converging into one conical body. *Stamina:* filamenta none; antheræ eight, linear, lodged in the grooves formed by the keel of the petals, adhering their whole length, but their chief insertion near the base. *Pistil:* germen superior, heart-shaped; style none; stigma pointed. *Pericarp:* capsule ovate, compressed, one-celled, two-valved, opening from the apex, about an inch and half long, and an inch broad. *Seeds:* from five to eight, inserted by pedicels

into the bottom of the capsule, cylindric, striated; the pedicels surrounded with numerous small pellucid vesicles. Essential Character. *Calix:* four-leaved. *Corolla:* four-petalled, inwardly keeled. *Nectaries:* four, awl-shaped; leaflets on the apex of the keel of the petals, converging. *Antheræ:* linear, sessile, in the grooves of the keel. *Capsule:* one-celled, two-valved. *Seeds:* many, inserted into a spongy receptacle.—The above *Essential Character* is thus corrected by Withering: *Nectaries:* lanceolate; leaflets inserted in the middle of the petals. *Antheræ:* in pairs, hanging down from the base of the leaflets of the nectary.——The only known species is,

1. Roxburghia Gloriosoides. Leaves alternate or opposite, nearly depending, heart-shaped, fine-pointed, the point recurvate, entire, smooth, shining, in substance soft and delicate, generally eleven-nerved, with beautiful very fine transverse veins running between the nerves, from four to six inches long. Willdenow observes, that this is a singular plant, between the *Liliaceæ* and the *Asclepiadeæ*; that the root is fusiform, the stem grooved, the branches alternate; that there are two bractes at the division of the peduncle; that the calix is yellow, and larger than the corolla, which is purple. It is the *Canipoo-Tiga* of the Telingas.—Native of Coromandel, in moist valleys among the mountains.

Royena; a genus of the class Decandria, order Digynia. —Generic Character. *Calix:* perianth one-leafed, pitcher-shaped, five-cleft, permanent. *Corolla:* one-petalled; tube the length of the calix; border spreading, revolute, five-parted; segments ovate. *Stamina:* filamenta ten, very short, fastened to the corolla; antheræ oblong, acute, twin, erect, the length of the tube. *Pistil:* germen ovate, ending in two styles, a little longer than the stamina; stigmas simple. *Pericarp:* capsule ovate, four-grooved, one-celled, four-valved: (Gærtner describes this a globular, fleshy, four-celled berry, covered by the permanent calix.) *Seeds:* nuts four, oblong, triangular, wrapped in an aril; (according to Gærtner, the seeds are solitary, all in four or two, oblong or elliptic, subtriquetrous or plano-convex.) Essential Character. *Calix:* pitcher-shaped. *Corolla:* one-petalled, with the border revolute. *Capsule:* one-celled, four-valved; (according to Gærtner, a four-celled berry.)——The species are,

1. Royena Lucida; *Shining-leaved African Bladder-nut.* Leaves ovate, somewhat rugged. It is an evergreen shrub, eight or ten feet high, and puts out branches on every side; flowers axillary, along the branches, having little beauty; berry red, and fleshy like an apple. It flowers in May and June.—Native of the Cape of Good Hope. All the plants of this genus are too tender to live through the winter in the open air of England; they must be removed therefore into the green-house in autumn, and treated in the same way as Orange-trees. This species, and also the fifth, are difficult to propagate here, for the branches which are laid down seldom put out roots, and those which do are two or three years before they make roots sufficient to transplant; and their cuttings very rarely succeed. The best time to plant the cuttings is early in the spring: they should be made from the young shoots: plant them in small pots filled with loam, and plunge them into a very moderate hot-bed; cover them down with hand-glasses, and refresh them with a little water every eighth or tenth day. If the cuttings shoot, inure them gradually to bear the open air; and when they are well rooted, plant each in a separate small pot, and afterwards treat them as the old plants. If they put out any young shoots from the bottom, lay them carefully down whilst young; slitting them, as is practised in laying Carnations. During warm weather, water them frequently, but gently; in cold weather sparingly. When they are rooted, take them off, and treat them in the same manner as the cuttings.

2. Royena Villosa; *Heart-leaved Royena.* Leaves cordate, oblong, tomentose underneath. This resembles the preceding species, but the branches are more villose. Flowers axillary, nodding, solitary, on villose stalks; bractes two, opposite, ovate, pointed, downy, large, deciduous. It flowers in June and July.—Native of the Cape.

3. Royena Pallens; *Pale Royena.* Leaves oblong-ovate, blunt, smooth.—Native of the Cape.

4. Royena Glabra; *Myrtle-leaved African Bladder-nut.* Leaves lanceolate, smooth. Stem shrubby, five or six feet high, sending out numerous slender, leafy, evergreen branches, covered with a purplish bark. The leaves are less than those of the Box-tree, entire, of a lucid green, and continuing all the year. The flowers come out from the wings of the leaves round the branches, and are white. Fruit roundish, purple, ripening in our green-houses in the winter. It flowers in September.—Native of the Cape. This species is very apt to send up suckers from the roots, and may be propagated that way. When it does not, the branches may be laid down. The cuttings succeed much more easily than those of the other species.

5. Royena Hirsuta; *Hairy-leaved African Bladder-nut.* Leaves oblong-lanceolate, somewhat villose. This rises with a strong woody stalk seven or eight feet high, covered with a gray bark, sending out many small branches alternately. Leaves an inch long, covered with soft hairs. The flowers come out on short peduncles from the side of the branches; they are small, and of a worn-out purple colour, appearing in July, but are not followed by seeds in England.—Native of the Cape. See the first species.

6. Royena Polyandra; *Oval-leaved Royena.* Leaves elliptic; flowers polygamous, many-stamined. This differs from the other species in the disposition of the flowers, which are in short, axillary, downy clusters. The stem has knotty, irregular branches.—Native of the Cape. See the first species.

7. Royena Angustifolia; *Narrow-leaved Royena.* Leaves lanceolate, acute, somewhat hairy underneath. This is also very different from all the species yet known, in having narrow lanceolate leaves, sharp at both ends, and somewhat hairy underneath. It flowers in June and July.—Native of the Cape. See the first species.

Rubia; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Calix:* perianth very small, four-toothed, superior. *Corolla:* one-petalled, bell-shaped, four-parted, without a tube. *Stamina:* filamenta four, awl-shaped, shorter than the corolla; antheræ simple. *Pistil:* germen twin, inferior; style filiform, bifid at top; stigmas two, capitate. *Pericarp:* berries two, united, smooth. *Seeds:* solitary, roundish, umbilicate. *Observe.* The corolla is frequently five-cleft. Essential Character. *Corolla:* one-petalled, bell-shaped. *Berries:* two, combined, one-seeded. ——The species are,

1. Rubia Tinctorum; *Dyer's Madder.* Leaves annual, about five or six in a whorl, ovate-lanceolate, ciliate, rugged on the upper surface, with little recurved prickles on the edge and keel; stem prickly. Root perennial, composed of many long, thick, succulent fibres almost as large as a man's little finger, its bark principally affording a scarlet dye. Stems herbaceous, annual, decumbent, widely spreading, branched, leafy, obtusely quadrangular, prickly, with little hooks at the angles. From the joints of the stalk come out the branches, which sustain the flowers; they appear cut into four segments resembling stars: and appear in June, being of a

yellowish green colour, and are sometimes succeeded by seeds, which seldom ripen in England; berries dark purple. —Native of the south of Europe, the Levant, and Africa. It is well known that this plant is so essential to dyers and calico-printers, that without it they cannot carry on their business. In England the consumption of it is so great, that more than two millions sterling has been annually paid for it in importations from foreign countries. This great demand naturally directing the attention of British agriculturists to the cultivation of the plant, the Society for the Encouragement of Arts and Manufactures offered premiums; and the Madder of England has in consequence been so improved as to be pronounced as good, if not better, than that imported from abroad. This plant, with others of the same natural order, appears to differ from other substances used for the purpose of dyeing, in having the property of tinging with a florid red colour, not only the milk, urine, &c. but even the bones of those animals which have fed upon it. From various recent experiments it appears, that the colouring matter of Madder affects the bones in a very short time, and that the hardest part of them first receives the red colour, which gradually extends from the outside through the whole bony substance, so long as the animal continues to take the Madder; but if this root be alternately given and intermitted for a sufficient length of time at proper intervals, the bones are found to be coloured in a correspondent number of concentric circles. —Madder is frequently mentioned by the Greek writers, who employed the roots with the same intentions as modern physicians. The roots have a bitterish and rather austere taste, and a slight and not disagreeable smell. They impart a dark red tincture to water; but to rectified spirits, and to distilled oils, only a bright red colour: both the watery and spirituous tincture taste strongly of the plant. Medical men consider Madder as a deobstruent, detergent, and diuretic; and it is chiefly used in the jaundice, dropsy, and other diseases supposed to proceed from visceral obstructions, particularly those of the liver and kidneys. Some modern writers have recommended it as an emmenagogue, and in rickety affections. With regard to its diuretic quality, Dr. Cullen asserts that it is not constant. As a remedy for the jaundice, it has the authority of Sydenham. That some French writers should prescribe it in a rickety state of the bones, appears surprising, since brute animals to which it was given, especially the younger, were considerably emaciated and weakened by its effects. Its virtues as an emmenagogue rest principally upon the authority of Dr. Home, who gave from a scruple to half a drachm of the powder, or two ounces of the decoction, three or four times a day; but Dr. Cullen says, I know of other practitioners in this country, who, after several ineffectual trials made with it, have now entirely deserted its use.—*Propagation and Culture.* As it is from Holland principally that we have been supplied with Madder; and the best sort is cultivated at Schowen in the island of Zealand; we shall first present a full detail of the manner of cultivating it in that country, and then subjoin the most successful means that have been used to cultivate it in Great Brtiain. A comparison of one with the other may afford hints for very important improvements, and assist the diligent and skilful farmer in the profitable cultivation of this very important article of trade. In the Netherlands, the land designed to grow Madder, if strong and heavy, is ploughed twice in the autumn, that the winter frost may afterwards mellow and break the clods. In the spring it is ploughed a third time, just before the planting of Madder. Light ground is only ploughed twice, and that in the spring; and at the last ploughing is divided into lands of three feet broad, with furrows between each land four or five inches deep. It requires a loamy substantial soil, not too stiff and heavy, nor yet very light and sandy, for though it may thrive tolerably well in the latter, still such land cannot have a second crop of Madder planted upon it in less than eight or ten years interval; but in the isle of Schowen, where the land is substantial, they need not stay longer than three or four years, in which interval the ground is sown with corn, or planted with any kind of pulse. In that island, a gemet of land, which is three hundred square feet, will yield from one thousand pounds to three thousand pounds weight, according to the goodness of the land and the favourableness of the seasons; but in light land the quantity is from five hundred to a thousand pounds weight. The time for planting Madder in Holland begins towards the end of April, and continues through May; and sometimes, in very backward springs, there is some planted at the beginning of June. The young shoots from the sides of the root are taken off from the mother plant with as much root as possible; these are called kiemen, or slips, and are planted with an iron dibble in rows at one foot asunder, and commonly four slips in a row. The quantity of these slips planted in one gemet is various; the price of the slips also varies according to the state of the market. The first year that the Madder is planted, it is customary to plant Cabbages or Dwarf Kidney Beans in the furrows between the beds; but there is always great care taken to keep the ground clean from weeds. In September or October, when the young Madder is cleaned for the last time that season, the green haulm or stalks of the plants are carefully spread down over the beds without cutting any part off, and in November the Madder is covered over the stalks with three or four inches of earth. This covering is performed either with the plough or with the spade; the latter is the best, though not the cheapest method. In the second year, at the beginning of April, which is about the time the young shoots are beginning to come out, the earth on the top of the beds is scuffled over and raked, to destroy the young weeds, and make the surface smooth and mellow, that the young shoots may more easily penetrate the ground. In the second summer there is also the same care taken to weed the Madder as in the first; and then nothing is planted or suffered to grow in the furrows. At the last time of clearing the ground, in September or October, the green haulm is again spread down upon the beds; and in November the Madder is again covered with earth in the same manner as in the first year. By this method of culture, it is easy to see how necessary it is to plant the Madder in beds, for thereby it is much easier covered with the earth of the furrows; and the earth of the beds is every time heightened, which will greatly lengthen the roots; hence the young shoots will have longer necks, and, by thus being deeply earthed, will put out more fibres, and have much better roots, without which they will not grow; and it is of equal use to the mother plants, since in the length of their roots consists the goodness and beauty of the Madder; for those which have but few main roots are not so much esteemed as those which are well furnished with side-roots, called tengels: a plant having many of these roots, is called a well-bearded Madder plant. On this account the side-roots should never be cut off, for, besides the loss of moisture, sometimes the plants will droop and become weak, and will produce but few young shoots, which are required in large numbers in the spring, and are very profitable, if plentiful in the second and third years. The Madder roots are seldom dug up by the Dutch in the second year, but generally after it has grown three summers; therefore the culture of the third year is the same as in the second, during the spring and summer.

In the isle of Schowen it is forbidden to dig up any Madder before the first day of September; but on that day, early in the morning, a beginning is made, and the person who carries the first cart-load to the stove has a premium of three ducats for his reward. When the Madder is dug out of the ground, it is carried to the stove, and there laid in heaps in that which is called the cold-stove, and separated with hurdles made of wicker, and memoranda kept of each parcel, and to what countryman it belongs, that each may be dried in their turns, and prepared or manufactured, for which turn generally lots are cast beforehand. It is then carried about six o'clock in the morning into the tower or steeple, hoisted in baskets by ropes to the rooms, and divided or spread, where it remains till the next day, lying there about twenty or twenty-one hours. Then those roots which have lain in the hottest places are removed to cooler, and those in the cooler parts are removed into hotter places nearer the oven. This is continued for four or five days, according as there has been more or less carried there. This tower or steeple, where the Madder is first dried, is heated by fifteen or sixteen flues or pipes of brick-work, which run on each side under the floor, and are covered with low burnt tiles, some of which are loose, so that by taking up these the heat is moderated, and conducted to any part of the tower, as the person who has the care of drying the Madder pleases. The tower has four or five lofts made of strong laths; they are four or five feet above each other, upon which the Madder is laid; these are heated by an oven, which is placed in a room where the work-people live. When the Madder is sufficiently dried in the tower, it is threshed on the threshing-floor, which is cleaned for that purpose, and then it is brought to the kiln, and there spread on a hair-cloth for about twenty hours, during which time the kiln is made more or less hot, according as the roots are more or less thick, or the weather more or less cold. The kiln consists of a room, the length of which is equal to the breadth of the stove, and is entirely arched over at the top: the oven by which the kiln is heated, is called the hog; this is built upon a stone wall, which rises a foot or two above ground; and the small arch, by which the heat passes through every part, has several square little holes in the brick-work, that the heat may come out; over these holes, on the top of the kiln, are laid wooden laths, and upon them a hair-cloth, on which the Madder is laid to dry, before it is carried to a pounding place. From the kiln the Madder is moved to the pounding house, and is there pounded on an oaken block made hollow, with six stampers plated at the bottom with iron bands; these stampers are kept in motion by a mill, very much resembling a grist-mill, which is turned by three horses: the presence of the pounding master is here always required, to stir the Madder with a shovel, and bring it continually under the stampers. When it is properly pounded, it is sifted and put into casks; the refuse being repounded till all reduced to powder. When the Madder is thus prepared and put into casks, it is, in the Netherlands, examined by sworn assayers, and the cask is stamped if the contents be good.—*Culture of Madder in England.* The land, says Mr. Miller, upon which I found Madder thrive best, is a soft sandy loam; and if it has been in tillage some years, it will be better than that which is fresh broken up. This should have at least a depth of two feet and a half or three feet of good earth, which must be quite cleared from the roots of Couch or any bad weed; for as the roots of Madder ought to remain three years in the ground, so where there are any of the weeds which spread and multiply at their roots, they will intermix with the Madder roots, and in three years will have taken such possession of the ground, as will not only greatly weaken the Madder, but render it difficult to separate their roots when taken up. The ground should be ploughed deep before winter, and laid in ridges to mellow; and if it be not too strong, there will be no necessity for ploughing it again till just before the time of planting the Madder, when the land should be ploughed as deep as the beam of the plough will admit; and there should be men following the plough in the furrows, digging a full spit below the furrow, and turning it upon the top. By preparing the ground of this depth, the roots of the Madder will strike down, and be of greater length, in which the goodness of the crop chiefly consists. The land being thus prepared and made level, will be fit to receive the plants.—The best time for planting is about the middle or end of April, according as the season is more or less forward, which must be determined by the young shoots, which are in the best state for planting when about two inches above the ground. In the taking up of these shoots for planting, the ground should be opened by a spade, that they may be separated from the mother plants with as much root as possible; for if the roots be broken off they will not succeed: these plants should be drawn up no faster than they are planted; for if they lie long above ground, they will shrink, and their tops will wither, and then they often miscarry, especially when brought from a distant place. When they are only a little withered by lying out of the ground, their roots should be set upright in water for a few hours, which will stiffen and recover them again. The ground being made smooth for planting, a line is drawn across it to mark out the rows, that they may be straight, for the more convenient cleaning, and for the better digging or ploughing the ground between the rows, then holes are made with an iron shod dibble at proper distances. The depth of these holes must be in proportion to the roots of the plants, which must be planted the same depth they had been while they were upon the mother plants; for if any part of the root is left above ground, the sun and winds will dry it, and retard the growth of the plant: on the other hand, if any of the green stem be buried, it will be prejudicial, though in a less degree. When the plants are put into the holes, the earth should be pressed close to them, to secure them from being drawn out of the ground, which crows and rooks have strength and sagacity to accomplish, wherever this precaution is not observed. If showers fall a few days after the plants are put in the ground, they will strike out new roots and become strong; so that if dry weather should afterwards happen, they will not be in so much danger of suffering thereby, as those which are later planted. Mr. Miller decidedly condemns the Dutch practice of planting rows of Dwarf Peas, Kidney Beans, &c. between the rows of Madder, as weakening the roots of the latter, which, he asserts, ought to be kept perfectly free, not only from weeds, but from every other vegetable. In order to keep the ground thus clean, it should be scuffled over with a Dutch hoe as soon as the young weeds appear, which is all the care required during the first summer. In autumn, when the shoots or haulm of the plants decay, it should be raked off the ground, and the intervals either dug with a spade, or ploughed with a hoeing plough, laying up the earth over the heads of the plants in a roundish ridge, which will be of great service to the roots. The Dutch cover the haulm of their Madder with earth, leaving it to rot upon the ground; this perhaps may be necessary in this country to keep the frost out of the ground, but has been found injurious to the Madder roots in England. In the following spring, before the Madder begins to shoot, the ground should be hoed and raked over smooth, that the young shoots may have no obstruction: and if there

should be any young weeds appearing on the ground, let it be first scuffled over to destroy the weeds, and then raked over smooth; after this, the same care must be taken in the following summer to keep the ground clean; and if it is performed by the hoe-plough, the earth of the intervals should be thrown up against the side of the ridges, which will earth up the roots, and greatly increase their strength; but before the ground of one interval is so hoed, the haulm of the plants should be turned over to the next adjoining interval; where they should be permitted to lie for a fortnight or three weeks, and then turned back again on those intervals which were hoed, observing first to scuffle the ground, to destroy any young weeds which may have appeared since the stirring of the ground; then the alternate intervals should be ploughed in like manner, turning the earth up against the opposite sides of the roots; by this method the intervals will be alternately ploughed, and the plants earthed up, whereby the ground will be kept clean and stirred, which will greatly promote the growth of the roots; and by this method the superficial shoots will be subdued, and the principal roots greatly strengthened. The following autumn the ground should be cleared of the haulm and weeds, and the earth raised in ridges over the roots, as in the foregoing year. The third spring the roots will furnish a great supply of young plants; but before these appear, the ground should be cleaned and raked smooth, that the shoots may have no obstruction to their coming up; and when the young plants are fit to take off, it should be performed with care, always taking off those which are produced at the greatest distance from the crown of the other plants, because they rob them of most of their nourishment, and the wounds made by separating them from the old roots, are not near so hurtful as those near the crown: for the stripping off too many of the shoots there, will retard the growth of the plants. The culture of the Madder in the third summer must be the same as in the second; but as the roots will then be much stronger, the earth should be laid up a little higher to them at the times when the ground is cleaned; and if all the distant superficial shoots which come up in the intervals are hoed or ploughed off, it will tend to strengthen the larger downright root: and as the haulm will now be very strong and thick, the frequently turning it over from one interval to another will prevent its rotting; for if it lies long in the same position, the shoots which are near the ground, where there will always be more or less damp, from being covered with the upper shoots, the air will be excluded, and rotting will be the consequence, for the shoots of Madder are naturally disposed to climb up any neighbouring support; but as the expense of staking them could not be generally incurred, turning over the haulm from one interval to the other will be found of great use, keep it from decaying, and alternately admitting the sun to each side of the roots, which is of vital importance to the growth and perfection of the Madder.—As soon as the haulm begins to decay in the third autumn, the roots may be taken up for use, because, when they have done growing for the season, they will be plumper and less liable to shrink than if dug up sooner, or suffered to remain longer. The digging up should be thus performed: a deep trench must be dug out at one side of the ground next to the first row of plants, in order to make a sufficient opening to receive the earth, which must be laid therein in digging up the row of roots; in order to that, it should be at least two feet broad, and two spits and two shovellings deep, and should be made as close as possible to the roots, being careful not to break or cut the roots in doing it. The row of roots must then be carefully dug up, turning the earth into the trench before mentioned. In the doing of this, there ought to be, to every person who digs, two or three persons to take out the roots, that none may be lost, and that as much earth as possible may be shaken out. After the principal roots are taken up, there will be many of the long fibres remaining below; therefore, to extract the roots as completely as possible, the whole spot of ground should be dug of the same depth as the first trench, and the pickers should follow the diggers to get them all out to the bottom. As the digging of the land to this depth is necessary in order to taking up the roots with as little loss as possible, so also is it the finest preparation for any succeeding crop, which will amply repay the labour and expense. After the roots are taken up, the sooner they are carried to the place of drying, the finer will be their colour. The first place in which they should be laid to dry, must be open on the sides to admit the air, but covered on the top to keep out the wet. If a building is to be erected new, such as the tanners have for drying their skins will be as proper as any, for they have weather boards from top to bottom at equal distances to keep out the driving rain, but the spaces between being open, admit the air freely; and if, instead of plank-floors or stages above each other, they were furnished with hurdles or basket-work, upon which the roots might be laid, the air being thereby allowed to have a freer passage all round the roots, would be more equally dried. In this place they may remain four or five days, by which time the earth which adhered to the roots will be so dry as easily to be rubbed off before they are removed into the cold stove; for the slower the roots are dried, the less they will shrink, and the better will be the colour of the Madder; and the cleaner they are from the earth, the better the commodity will be for use when prepared. After the roots have lain a sufficient time in this place, they should be removed into another building, called the cold stove, in which there should be conveniences of flues passing through different parts of the floor and the side walls; in this the roots should be laid thin upon the floors, and turned from time to time as they dry, taking away those roots which are nearest to the hottest flues, and placing them in a cooler part of the room; removing such of them as had been in the colder parts, to that warmest situation. Constant care in this particular will improve the quality of the root; for the more equally it is dried, the better it will be for use. When the outside of the root has been sufficiently dried in the cold stove, they should be removed to the threshing floor, which may be the same as in a common barn where corn is threshed. The floor should be swept as clean as possible, and the roots threshed to beat off the skins or outside coverings, which is the part that is prepared separately from the inner part of the root, and is called Mull, being sold at a very low price, as it is the worst sort of Madder, and cannot be used where the permanency or beauty of the colours are regarded. These husks therefore are separated from the roots, and pounded by themselves, and sold under the above-mentioned name of Mull. After this mull is separated from the roots, they must be removed to a warmer stove, and there dried with great care; for if the heat be too great, the roots will dry too fast, whereby they will lose much in their colour and weight. The way to prevent this, is, to turn them frequently, and to keep the fires properly regulated. If a good thermometer be fixed in the room, it will enable the superintendant to ascertain the degree of heat, which should be greater in some cases than others, according to the dryness or succulence of the roots, and to the state of the weather, whether cold or damp; it may however be observed, that it is safer to fall short of the proper temperature than to exceed it, for though the roots may require a longer time to dry with a slow heat, yet the colour

will be better. When the roots have been properly dried in this stove, they must be carried to the pounding-house, and reduced to powder in the manner before related.——Mr. Arbuthnot has shewn, by repeated experiments, that it may be cultivated on land not of extraordinary natural fertility; that good husbandry, with rich manuring, will be sufficient to ensure a crop; consequently, that the Madder culture may be extended over most parts of the kingdom, except on poor stony or clayey soils: that the profit made by an application of the land during three years, is superior to that of four; that the crop requires the ground to be well cleaned, on account of the great difficulty of extracting root-weeds from among the fibres of the plants, which consequently would get entire possession of the ground in three years; that the average profit of an acre amounts to about seven guineas, under the disadvantages of first attempts and want of experience; if the soil upon which these experiments were made, had been naturally rich, the profit would probably have been double: that the culture of this plant ameliorates and cleans the soil by the hand-hoeings, numerous horse-hoeings, and extraordinary tillage the ground receives in taking up the roots; that rich manuring is of the greatest importance; that great mischief is done to the crops by drawing plants from them; and that the roots bear an exact proportion to the luxuriance of the branches and leaves. Instead of spoiling the plantations of Madder by drawing, it is much better to leave such a part of the crop as will be wanted for a supply, taking up the plants in the spring instead of the autumn: one acre of good Madder will yield plants enough for ten acres. The best manure is farm-yard dung, which should not be used in large quantities. Top-dressings are ineffectual, as the best will not last three years. The land, says Mr. Young, should be ploughed fourteen inches deep. Old ley, or new land, is not fit for this crop, on account of the wire or sod-worm; such land should be thrown into one round of crops, before planted with Madder. The intervals between the rows of plants should be repeatedly horse-hoed with a shim, and then the plants earthed up by a double mould-board plough, with expanding earth-boards; the rows also must be hand-hoed as often as necessary. The sets may be planted in rows at eighteen inches or two feet distance, and a foot asunder in the rows. The best distance will vary according to the goodness of the land. But in general, the nearer the rows, the greater will the crop be, at least as near as two feet equally distant. Single rows at four feet are not half so advantageous. Two rows on four feet are almost twice as beneficial as single ones; but though two rows on a four-foot land amount in the whole to the same, as equally distant at two feet, yet they do not nearly equal them in product; which seems to indicate that the plants should spread equally over the land. From the above statement it is clear, that one great advantage resulting from the cultivation of Madder generally, will be the affording employment to a great number of hands, from the time harvest is over till the spring of the year, besides rendering us independent of foreign countries for this necessary article of the cotton manufacture.

2. Rubia Chilensis; *Chili Madder.* Leaves annual, in fours; peduncles axillary, solitary, one-flowered; stem even; berries roundish, red. The root is perennial, much divided, and spreading, affording a dye like the first species.—Native of Chili, on mountains.

3. Rubia Peregrina; *Wild Madder.* Leaves in fours or fives, elliptic, above shining, even; flowers five-cleft. Root perennial, branched, penetrating deeply into the fissures of the rocks; its outer bark red; stems several, branched, diffused, four-cornered, the corners set with prickles pointed backwards, not dying in the winter, but some of it remaining alive, and putting forth fresh shoots in the spring. This plant, in climbing up the rocks and through the shrubs, supports itself by means of the prickles on the angles of the stem, and under the margins and midribs of the leaves.—It is a native of England, among bushes and upon rocks: it occurs near Biddeford in Devonshire, and is common in the hedges throughout the greater part of that county; found also upon St. Vincent's rocks near Bristol; in Dorsetshire in the hedges; in the Isle of Purbeck; and between Whitchurch and Milbourn St. Andrew's; also under Hood-hill in the parish of Stour-pain near Blandford, where Parkinson mentions having seen it; found likewise in the Isle of Portland, in Cornwall, in the Isle of Wight, and on Tunbridge rock, at Chepstow in Monmouthshire.

4. Rubia Lucida; *Shining-leaved Madder.* Leaves perennial, in sixes, elliptic, shining; stem even. It flowers in July.—Native of Majorca, Zante, and Cyprus.

5. Rubia Fruticosa; *Prickly-leaved Madder.* Leaves perennial, elliptic, prickly at the edge and keel; stem frutescent, rough; flowers yellowish, axillary, on three-flowered peduncles. It flowers in September.—Native of the Canaries.

6. Rubia Angustifolia; *Narrow-leaved Madder.* Leaves perennial, linear, rugged above. Stems diffused, very rugged, four-cornered; flowers yellow, flat, five-cleft. It flowers in July and August.—Native of Minorca.

7. Rubia Cordifolia; *Heart-leaved Madder.* Leaves perennial, in fours, cordate. This is a diffuse scandent plant, quite smooth.—Native of the Cape of Good Hope, Siberia, China, Japan, where it is used in dyeing; as also in many parts of the East Indies, and of Africa.

Rubus; a genus of the class Icosandria, order Polygynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft; segments oblong, spreading, permanent. *Corolla:* petals five, roundish, the length of the calix, from upright spreading. *Stamina:* filamenta numerous, shorter than the corolla, inserted into the calix; antheræ roundish, compressed. *Pistil:* germina numerous; styles small, capillary, springing from the side of the germen; stigmas simple, permanent. *Pericarp:* berry compounded, consisting of roundish *acini*, collected into a convex head, concave below; each one-celled. *Seeds:* solitary, oblong; receptacle of the pericarpia conical. *Observe.* The acini are united into a compound berry, and are not separable without tearing them asunder, except in the thirtieth species, which has the acini distinct. The thirty-fifth species is monœcous. Essential Character. *Calix:* five-cleft. *Petals:* five. *Berry:* composed of one-seeded acini.——The species are,

* *Frutescent.*

1. Rubus Rosæfolius; *Rose-leaved Bramble.* Leaves quinate-pinnate and ternate, green on both sides; stem and petioles prickly; flowers solitary; fruits globular, composed of very numerous smooth acini, and appearing not to be very succulent.—Found in the Island of Mauritius.

2. Rubus Pinnatus; *Pinnate-leaved Bramble.* Leaves quinate-pinnate and ternate, wrinkled, smooth on both sides; stem, petioles, and peduncles, prickly; raceme terminating.—Native place unknown.

3. Rubus Australis; *South Sea Bramble.* Shrubby, diœcous: leaves ternate, and quinate-pinnate; stem and petioles prickly; racemes axillary, simple.—Native of New Zealand.

4. Rubus Idæus; *Raspberry.* Leaves quinate-pinnate, and ternate, tomentose underneath; petioles channelled; stem prickly; flowers in panicles; fruit red, grateful to the smell and taste, deciduous, bristly, with the permanent styles placed upon a conical receptacle. The stems are erect,

shrubby, though only biennial, with creeping perennial roots. It flowers in May and June. Among the varieties are: the Red-fruited; the White-fruited; and the Twice-bearing; the first crop of which ripens in July, and the second in October; but the last seldom have much flavour. The sorts most cultivated are, the Early White, the Large Common White, the Double-bearing White, the Large Red, the Red Antwerp, the Large White Antwerp, the Smooth Cone Double-bearing, and Woodward's New Raspberry. These varieties are accidental; and though the size of the fruit has been greatly increased by culture, this appears to have been effected at the expense of the flavour. The fruit, as presented by nature, is grateful to most palates, but sugar improves the flavour, and hence it is much esteemed when made into a sweatmeat. The ripe fruit is fragrant, subacid, and cooling; it allays heat and thirst, and promotes the natural excretions in common with other summer-fruits. A grateful syrup, prepared from the juice, is sold by all the apothecaries. It dissolves the tartar of the teeth; but the Strawberry does the same thing more effectually. The fresh leaves are the favourite food of kids. This fruit was anciently called Raspis, or Raspisberry, whence the common name.—It is a native of many parts of Europe, in rocky mountains, moist situations, woods, and hedges: and in America, from Canada to Pennsylvania.—*Culture.* This plant is generally propagated by suckers, though those raised from layers should be preferred, because they will be better rooted, and not so liable to send out suckers as the other, which generally produce such quantities of suckers from their roots, as to fill the ground in a year or two; and where they are not carefully taken off or thinned, it will cause the fruit to be small, and in less quantities, especially when the plants are placed near each other, which too often happens, for few persons allow them sufficient room. In preparing these plants, their fibres should be shortened, but the buds which are placed at a small distance from the stem of the plant, must not be cut off, because those produce the new shoots the following summer. These plants should be placed about two feet asunder in the rows, and four or five distant row from row; for if they are planted too close, their fruit is never so fair, nor will it ripen so kindly, as when they have room for the air to pass between the rows. The soil in which they thrive best is a fresh strong loam, for in warm light ground they do not produce such a plenty of fruit, for they naturally grow in cold land and in shade; therefore when they are planted in a warm situation and in a light soil, they do not succeed. The season for dressing them is in October, at which time all the old wood that produced fruit the preceding summer should be cut down below the surface of the ground, and the young shoots of the same year must be shortened to about two feet in length; and the spaces between the rows should be well dug, to encourage the roots. A very little dung, buried in the soil, will make them shoot vigorously in the summer following, and their fruit will also be much fairer. Weed them during summer; which, if well performed, with the before-mentioned culture, is all the management they will require, except that it will be proper to form new plantations once in three or four years, because, when the plants are suffered to remain long, they will produce few and small fruit.

5. Rubus Occidentalis; *Virginian Raspberry.* Leaves tern, tomentose underneath; stem prickly; petioles round. This species may be known at first sight by the blue cloud or bloom on its stem. The fruit is of a deep black when ripe; it has little flavour, and ripens late in the autumn. It flowers in May and June.—Native of North America.

6. Rubus Triphyllus; *Three-leaved Bramble.* Leaves ternate, tomentose underneath; leaflets ovate, gashed, toothed; branches, petioles, and peduncles, villose and prickly.—Native of Japan.

7. Rubus Tomentosus; *Downy-leaved Bramble.* Leaves ternate, obovate, acute, unequally toothed, tomentose on both sides; the lateral ones somewhat gashed. This is very different from the Common Bramble.—Native of Germany and Switzerland.

8. Rubus Hispidus; *Bristly Bramble.* Leaves ternate, naked; stems and petioles very hispid, with stiffish prickles, —Native of Canada.

9. Rubus Parvifolius; *Small-leaved Bramble.* Leaves ternate, tomentose underneath; stem rough-haired, with recurved prickles on that and the petioles; flowers purple, in a loose terminating panicle; berry roundish, red.—Native of the East Indies, China, and Cochin-china.

10. Rubus Sanctus; *Palestine Bramble.* Leaves ternate and simple, tomentose underneath; branches and footstalks downy, with hooked prickles; panicles downy, many-flowered; stem angular. This has a general appearance to our common Bramble; but has smaller, more rounded, and fewer leaflets: the flowers and whole plant are of smaller dimensions.—Native of Palestine.

11. Rubus Jamaicensis; *Jamaica Bramble.* Leaves quinate or ternate, tomentose underneath; stem, petioles, and leaves, pubescent, with recurved prickles; panicles diffused. —Native of Jamaica, and the neghbouring islands.

12. Rubus Cæsius; *Dewberry Bramble.* Leaves ternate, hairy underneath; the lateral ones two-lobed; stem prickly, prostrate, glaucous; calix embracing the fruit. This has weaker trailing stalks than the Common Bramble; the fruit is black, with a bright blue tinge or bloom, composed of few large grains: its flavour is agreeably acid, without the faint taste of the Common Blackberry.—Native of Europe, in dry shady ditches, woods, and the borders of fields; flowering in June and July, and fruiting through August and September, till stopped by frost.

13. Rubus Corylifolius; *Hazel-leaved Bramble.* Leaves subquinate, hairy underneath, the lateral ones sessile; prickles straightish; calices of the fruit bent back. Stems biennial, roundish, red, much more brittle than those of the next species, so that thatchers, who use the latter for binding thatch, reject this species as unfit for that purpose. The fruit of this plant is earlier, of a brownish black colour, composed of fewer acini or grains, and has a more gratefully acid taste, than the next species.—This and the next species are very common in our hedges.

14. Rubus Fruticosus; *Common Bramble.* Leaves subquinate, tomentose underneath; leaflets petioled; stem angular, beset like the footstalks and flower-stalks with hooked prickles; calix bent back. Stem shrubby, and perennial, long and arching, purplish; flowers in long, cylindrical, compound, dense, and rigid panicles, of a blush or rose colour, seldom white; berry of numerous crowded grains, of a violet black when ripe, with a sweet mawkish taste. The varieties of the Bramble are, 1. That with white fruit, which has the bark and leaves of a lighter green. 2. The Bramble with a double flower, which is introduced into plantations of shrubs. 3. The smooth and thornless Bramble. 4. That with cut leaves: and, 5. That with variegated leaves. In some countries Blackberries are called *Bumblekites;* in others *Scaldberries,* from their supposed quality of giving scald heads to children who have eaten them, as most children will where they can obtain them, in immoderate quantities. The whole plant is of an astringent nature, but the unripe berries more so than any other part, and may be made use of to good purpose in

all manner of fluxes and hæmorrhages. A decoction of the leaves, with the addition of a little honey, is an excellent gargle for the thrush, and all other sorenesses of the mouth and throat. The juice of the fruit, with sugar, makes a pleasant and wholesome wine. A decoction of the flowers provokes urine, and is good in the stone and gravel. The green twigs are of great use in dyeing woollen, silk, and mohair, black. Silkworms will sometimes feed upon the leaves, for want of those of the Mulberry.—The Bramble is easily increased by laying down its branches, which put out roots at every joint very freely. They may be transplanted at any time from September to March, and will grow in almost any soil or situation. It may assist in making or strengthening a fence; and the varieties with double flowers and variegated leaves are very ornamental in plantations.

15. Rubus Villosus; *Hairy Bramble.* Leaves quinate, elliptic, acuminate, sharply serrate, villose on both sides; stems and petioles prickly; clusters simple, lax, hairy, and glandular, sometimes leafy.—Native of North America, from New England to Carolina, in old fields and commons, flowering in June and July, and there called Blackberries.

16. Rubus Canadensis; *Canadian Raspberry.* Leaves digitate, in tens, fives, and threes; stem unarmed.—Native of Canada, in rocky barren woods.

17. Rubus Odoratus; *Flowering Raspberry.* Leaves simple, palmate; stem unarmed, many-leaved, many-flowered; root perennial, creeping. It rarely produces fruit with us; but in North America, the berries, says Mr. Pursh, are yellow, of a large size, and very fine flavour. Nurserymen and gardeners have called it the Flowering Raspberry, because it is regarded in Europe merely for its large crimson flowers, which are showy, and plentifully produced in succession during the whole summer.—Found in the woods of Canada, and on the Alleghany mountains, from New York to Carolina, flowering in June and July. This plant is extremely hardy, and easily propagated by suckers; the only care required is to keep it within proper bounds. Young plants produce the largest and finest flowers; on account of which, and the largeness and elegant form of the leaves, it has long had a place in our ornamental plantations.

18. Rubus Moluccanus; *Molucca Bramble.* Leaves simple, cordate, sublobed; stem prickly, decumbent.—Native of Amboyna, and the Molucca islands.

19. Rubus Microphyllus. Shrubby, prickly: leaves simple, cordate, ovate, blunt, sublobate, smooth; peduncles solitary, one-flowered: fruit yellow, esculent, sapid.—Native of Japan, between Miaco and Quana, flowering in April.

20. Rubus Incisus. Leaves simple, cordate, gashed, smooth; stem erect, prickly.—Native of Japan.

21. Rubus Japonicus. Shrubby, unarmed, very smooth; leaves simple, cordate, oblong, acuminate, doubly serrate; peduncles solitary, one-flowered.—Native of Japan. This is the *Corchorus Japonicus* of Thunberg; a beautiful shrub, quite hardy, and introduced into our gardens: its double yellow flowers are much admired.

22. Rubus Corchorifolius. Shrubby, prickly, tomentose: leaves simple, oblong, cordate, serrate; peduncles solitary, one-flowered.—Native of Japan.

23. Rubus Elongatus. Leaves simple, cordate, acuminate, doubly crenate, tomentose underneath; stem prickly; calices blunt.—Found in Java.

24. Rubus Pyrifolius. Leaves simple, oval, acuminate, serrate, naked; stem prickly, panicled; petals minute.—Native of Java.

25. Rubus Strigosus. Plant unarmed, very rough: leaflets three, pinnate-quinate, oval, obtuse at the base, acuminate; calices acuminate; flowers at the top of the branchlets, axillary, solitary; peduncles and calices hispid.—Grows on the mountains from Canada to Virginia. This is an upright shrub, the berries of which are agreeable to eat.

26. Rubus Cuneifolius. Branches, petioles, and peduncles tomentose, recurvate-aculeate; leaves from three to five, digitate; leaflets cuneate-obovate, unequally toothed; racemes terminal, paniculate; pedicels divaricate, somewhat naked. This is a straggling brier, of a gray aspect, with hard dry berries.—It grows in the sandy fields and woods of New Jersey and Carolina.

27. Rubus Trivialis; *American Dewberry.* Plant sarmentose procumbent; petioles and peduncles recurvate, aculeate-hispid; stipules subulate; leaves ternate or quinate, oblong-oval, acute, unequally serrate, subpubescent; pedicels solitary, elongated; petals obovate, three times as long as the calix. The flowers of this species are large; and the berries black, and large, with a very agreeable taste, known by the name of Dewberries.—A common American plant, growing in old fields from New England to Carolina.

28. Rubus Spectabilis; *Elegant American Bramble.* Plant unarmed, glabrous: leaves ternate, ovate, acute, duplicate-unequally-serrate, pubescent on the under side; peduncles terminal, uniflorous, solitary; petals ovate, of a fine deep purple colour; segments of the calix oblong, short acuminate, pubescent.—Grow on the banks of the Columbia. This is a very beautiful plant, four or five feet high, smooth, and destitute of prickles.

** *Subherbaceous.*

29. Rubus Pedatus. Leaves pedate, quinate, gashed; peduncles filiform, bracted in the middle; calices smoothish. This is a tender delicate plant, with creeping roots, throwing up at intervals short simple stems, with one or two leaves.—Found in the western parts of North America.

30. Rubus Saxatilis; *Stone Bramble.* Leaves ternate, smoothish; runners creeping, herbaceous; panicle few-flowered. The whole herb is of a slender delicate habit, light green, slightly downy. It spreads much by its long trailing shoots, naked or leafy, which do not blossom till their extremities have taken root. The fruit is of a most beautiful pink colour when ripe, of an agreeable acid flavour, composed of three or four large acini or grains. The Scotch call them Roebuck-berries, and the Russians ferment them with honey, and extract a potent spirit from them.—Native of Europe, especially in the northern parts: in Scotland, Wales, and Ireland, it occurs among stones, in shady places on the sides of mountains. It is not unfrequent in the northern parts of England, where it has been noticed in the woods about Settle and Ingleton, Yorkshire; not far from the summit of Helsfelnab, near Kendal, in Westmoreland; at Dob bottom near Burnley, Lancashire; and upon the hills opposite Matlock baths, Derbyshire. It flowers in June.

31. Rubus Arcticus; *Dwarf Crimson Bramble.* Leaves ternate, smooth; stem unarmed, one-flowered; root creeping, but no runners; fruit purple, sweet, and fragrant, very pleasant, and, according to Linneus, almost as large as a mulberry. The same great botanist, in his Lapland journey, when almost sinking under hunger and fatigue, found himself relieved, and his spirits refreshed, by eating these vinous berries. He informs, us, that the principal people in the province of Norland make a syrup, a jelly, and a wine, from these berries, which they partly consume themselves, and partly send to their friends at Stockholm, as a dainty of the rarest and most delicious kind; and he adds, that of all the wild Swedish berries this holds the first place. It flowers here in June.—Native of the north of Europe, Asia, and America.

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RUBUS SPECTABILIS ——
Elegant American Bramble.

P. 494.

RUBUS ODORATUS ——
Flowering Raspberry.

W. Mallinson sc.

Published by Fisher Son & Cº Caxton London. 1828.

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32. Rubus Trifidus. Leaves simple, three-cleft, cut and serrated, smooth; stem unarmed. Fruit esculent, and pleasantly tasted.—Native of Japan, near Quana; flowering in April.

33. Rubus Stellatus. Leaves simple, cordate, three-lobed, wrinkle-veined; stem unarmed, one-flowered, erect; petals lanceolate. The fruit is purple; root perennial, branched, fibrous.—Found in the back settlements of North America.

34. Rubus Geoides. Leaves simple and ternate, blunt, serrate, naked, the end leaf very large.—Found in South America, at the straits of Magellan.

35. Rubus Chamæmorus; *Mountain Bramble*, or *Cloudberry*. Leaves simple, lobed; stem unarmed, one-flowered; calicine segments ovate. This plant has an elegant appearance. Root creeping, throwing up here and there solitary stems about a span high; leaves shaped like those of the Mallow; flowers on long stalks, white; berries of a tawny dull orange colour, composed of many acini, acid, mucilaginous, and not unpleasant: from the lofty situations in which they grow, they have obtained the name of Cloud-berries, as also Knot and Knout berries. The flowers appear in June soon after the snow is dissolved; and the fruit is scarcely well ripened in August, before the plant is again overwhelmed with its wintery covering. The snow preserves the fruit, and is used by the Laplanders to keep it through the winter; for they, as well as the Scotch Highlanders, esteem it one of the most grateful and useful fruits, especially on account of its long duration. Its taste has something of the flavour of Tamarinds; and it is held to be highly antiscorbutic. The Norwegians pack them up in wooden vessels and send them to Stockholm, where they are served up in desserts or made into tarts; while the Laplanders bruise and eat them with the milk of their reindeer.—Native of Sweden, Denmark, Norway, Siberia, and Great Britain. It is found on the highest mountains in Scotland, as Ben Lomond, and the mountains about Loch Rannock in Perthshire; and in the peat-bogs and mountains of Carnarvonshire, and other counties of Wales. In England, it has been observed about Settle, Ingleton, Ingleborough, and near Egleston, in Yorkshire; between Patterdale and Keswick in Cumberland; on Axedge near Buxton, Derbyshire; and in Barrowfield wood and Cald Kail-scrogs, near Kendal in Westmoreland.

36. Rubus Dalibarda; *Simple-leaved Bramble*. Leaves simple, cordate, undivided, crenate; scape leafless, one-flowered; root creeping, fibrous; runners prostrate, herbaceous.—Grows in Canada, in shady woods and bogs.

37. Rubus Obovalis. Hairs rigid, hispid; leaves ternate, rotund-oboval, serrate, naked; stipules setaceous; racemes floriferous, subcorymbose, with few flowers; bractes ovate; pedicels elongate; berries with only a few large grains, black and sweet.—Grows in swamps among Sphagnum, on the mountains from New York to Carolina.

38. Rubus Pistillatus. Stem unarmed, one-flowered; leaves ternate, glabrous, finely serrated; petals oblong, entire; styles approximating.—Grows in the bogs of Canada, and on the north-west coast of America.

Rudbeckia; a genus of the class Syngenesia, order Polygamia-Frustranea.—Generic Character. *Calix:* common with a double row of scales; scales flat, widish, short, six in each row. *Corolla:* compound radiate; corollets hermaphrodite, numerous, in a conical disk; females about twelve, very long, in the ray: proper of the hermaphrodite tubular, funnel-form, with a five-toothed border; female ligulate, lanceolate, with two or three teeth, flat, pendulous. *Stamina:* in the hermaphrodites; filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* in the hermaphrodites; germen four-cornered; style filiform, the length of the corollets; stigma two-parted, revolute. In the females; germen very small; style none; stigma none. *Pericarp:* none, except the unchanged calix. *Seeds:* in the hermaphrodites only, solitary, oblong, crowned with a membranaceous four-toothed rim; in the females none. *Receptacle:* chaffy, conical, longer than the common calix; chaffs the length of the seeds, erect, channelled-concave, deciduous. Essential Character. *Calix:* with a double row of scales. *Seed:* crowned with a four-toothed rim. *Receptacle:* chaffy, conical.——The species are,

1. Rudbeckia Laciniata; *Broad Jagged-leaved Rudbeckia*. Leaves compound, laciniate. A hardy perennial: stems five, eight, or ten feet high, erect, branched, furrowed, smooth; flowers large, terminal; radius yellow; disk ovate, brown. Mr. Miller makes two species of this, both of which are natives of North America, particularly of Virginia and Canada, and flowers here in July.—Neither this nor the next species produces seeds here, but they are easily propagated by parting the roots; are hardy, and delight in a moist soil.

2. Rudbeckia Digitata; *Narrow Jagged-leaved Rudbeckia*. Lower leaves compound; stem-leaves quinate and ternate; upper ones single. It flowers in August and September.—Native of North America.

3. Rudbeckia Triloba; *Three-lobed Rudbeckia*. Leaves spatulate; the lower three-lobed; the upper undivided; stem hairy, much branched.—Native of North America. In warm summers this species perfects its seeds in England, and the plants will live through the winter in the open air in mild seasons, and may be increased by slips or heads; but the best way is to raise them from seeds, and in the second year the seedlings will flower and produce ripe seeds.

4. Rudbeckia Hirta; *Hairy Rudbeckia*. Leaves undivided, spatulate, ovate, triple-nerved, serrate, rough-haired; receptacle conical; chaffs lanceolate. The peduncle is naked, nearly a foot in length, and is terminated by one pretty large yellow flower, shaped like the Sunflower. The succession of flowers lasts six weeks, until the middle of July, when the frost sets in.—Native of Virginia, and several other parts of North America. The root of this species will continue four or five years, but unless care be taken to shelter it in winter, it is sometimes destroyed by cold and too much wet; but frequently produces good seeds in England, especially in favourable seasons. It is, however, here generally propagated by offsets or slips procured from America. The best time to separate the offsets is in the spring. The plants will live abroad in the open air through the winter, in a dry soil and warm situation; but it will always be prudent to shelter two or three plants under a common hot-bed frame, to preserve the species, especially in very severe winters. The same directions apply to the two next species; but they rarely produce seeds in England, nor do the plants put out buds whereby they may be increased that way.

5. Rudbeckia Fulgida; *Bright Rudbeckia*. Leaves oblong-lanceolate, toothletted, hispid, narrowed and subcordate at the base; receptacle hemispherical; chaffs lanceolate. Rays deep orange; disk dark purple. It flowers in July.—Native of North America. See the preceding species.

6. Rudbeckia Purpurea; *Purple Rudbeckia*. Leaves lanceolate-ovate, alternate, undivided; petals of the ray bifid. This is easily distinguished from the other species by the long, narrow, purple, pendulous florets of the ray.—It is a native of Carolina and Virginia. See the fourth species.

7. Rudbeckia Angustifolia; *Narrow Simple-leaved Rudbeckia*. Leaves opposite, linear, quite entire; root perennial. It flowers in August and September. Native of Virginia.—This, like the first and second species, may be plen-

tifully propagated by parting the roots in October when the stalks begin to decay. They love a moist soil, and should be allowed room; for if they are too near other plants, they will be robbed of their nourishment.

8. Rudbeckia Lævigata. Plant very glabrous on both sides; stem levigated, paniculate; branches corymbose; peduncles elongate, uniflorous; leaves ovate-lanceolate, acuminate on both sides, triply nerved, very entire; little leaves of the calix lanceolate, of the length of the ray; rays pale yellow, short.—Grows in Georgia.

9. Rudbeckia Discolor. Branches corymbose, uniflorous; peduncles naked, elongate; leaves lanceolate, strigose-pilose, entire; little leaves of the calix ovate, acute; petals lanceolate, very entire, discoloured, of the length of the calix; flowers small; rays yellow, and deep orange or purple underneath.—Grows in Florida.

10. Rudbeckia Aristata. Stem hispid; branches elongate, corymbose, uniflorous; leaves lanceolate-oblong, serrate, hispid; disk subhemispherical; chaff of the pappus subulate, awned; flowers small, deep yellow.—Grows in South Carolina.

11. Rudbeckia Radula. Stem hispid on the lower part, glabrous, and somewhat naked above; peduncles very long, uniflorous; leaves ovate, attenuate, tuberculate, hispid; calices imbricate; squames ovate, acuminate, ciliate.—Grows in Georgia.

12. Rudbeckia Subtomentosa. Plant slightly pubescent, subtomentose: stem branchy; branches erect, multiflorous; leaves oblong-lanceolate, acute, subserrate; lower leaves trilobed; leaflets of the calix incumbent, shorter than the ray. —Grows in mountain meadows in Virginia and Illinois.

13. Rudbeckia Columnaris. Stem strict, simple, with but few flowers on the summit; peduncles elongate; leaves pinnatifid, cut; segments linear; calix simple, five-leaved; rays from five to eight; disk cylindraceous, elongate.—Grows on the Missouri.

Rue. See *Ruta.*

Rue, Goat's. See *Galega.*

Rue, Meadow. See *Thalictrum.*

Ruellia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, five-parted, permanent; segments linear, acute, straight, permanent. *Corolla:* one-petalled, irregular, with a patulous inclined neck; border five-cleft, spreading, blunt, with the two upper segments more reflexed. *Stamina:* filamenta four, placed where the tube widens, approximating by pairs; antheræ scarcely longer than the tube. *Pistil:* germen roundish; style filiform, the length of the stamina; stigma bifid, acute, the lower segments rolled in. *Pericarp:* capsule round, acuminate both ways, two-celled, two-valved, opening elastically by the claws; partition contrary. *Seeds:* a few, roundish, compressed. *Observe.* In some species there is the rudimentum of a fifth stamen. Essential Character. *Calix:* five-parted. *Corolla:* subcampanulate. *Stamina:* approximating by pairs. *Capsule:* opening by elastic teeth.——The species are,

1. Ruellia Blechum; *Hairy-leaved Thick-spiked Ruellia.* Leaves ovate, serrate-toothed, somewhat hirsute; spikes ovate; inner bractes in pairs; flowers three together, sessile; seeds black. This annual plant is common in pastures and bushy places in Jamaica.—Like most of the other species, it is propagated by seeds, which must be sown early in the spring in pots filled with light rich earth, and plunged into a moderate hot-bed; and when the plants come up, they must be transplanted each into a separate small pot filled with rich earth, and plunged into a hot-bed of tanners' bark, where they must be shaded from the sun until they have taken new root; after which time they must have free air admitted to them every day in warm weather, and be constantly watered three or four times a week during the summer. If they succeed well, the eighth and eleventh species will produce flowers in the following July, and perfect their seeds in August: but the roots will continue, provided they are plunged into the bark-bed in the stove, and kept in a moderate temperature of heat. If the seeds be permitted to scatter, as their pods discharge them with a violent spring into the neighbouring pots, the plants will come up without care, and may be transplanted into pots filled with fresh loamy earth, and plunged into the tan-bed.

2. Ruellia Blechioides; *Smooth Thick-spiked Ruellia.* Leaves oblong, somewhat toothed, smooth; spikes ovate; flowers longer than the bractes; stems prostrate, dichotomous, even, slightly four-cornered. Browne says, that this plant is pretty frequent in most dry and shady places, among the lower hills of Jamaica; that it thrives best in a gravelly soil, but seldom rises above two feet and a half in height.—See the preceding species.

3. Ruellia Angustifolia; *Narrow-leaved Ruellia.* Leaves linear-lanceolate; spikes oblong; bractes ovate, hirsute.—Native of the West Indies.

4. Ruellia Strepens; *Whorl-flowered Ruellia.* Leaves petioled; peduncles three-flowered, short; root fibrous, perennial; stems about a foot high. It acquired the epithet *Strepens* from the crashing sound which the leaves make when handled, on account of their very dry nature. Flowers axillary, two or three from the same point, sitting very close to the stalk, small, of a pale purple colour and very fugacious, opening early, and gone by ten or eleven in the forenoon. They appear in July and August.—Native of Virginia and Carolina. It is not a plant of long continuance, seldom lasting longer than two years; but if treated as directed under the first species, it will ripen seeds in the second year, and may then be easily propagated.

5. Ruellia Macrophylla; *Long-leaved Ruellia.* Leaves ovate, lanceolate, acuminate, quite entire; peduncles axillary, elongated, two-flowered; stem four-cornered, pubescent, seemingly herbaceous.—Native of Santa Martha.

6. Ruellia Patula; *Spreading Ruellia.* Shrubby, villose, viscid: leaves ovate, quite entire; flowers axillary, aggregate. The whole plant is very fetid, and somewhat villose, as also is the calix. Corolla dirty flesh-colour; it emerges from the calix in the evening, is fully expanded next morning, and falls before the return of night.—Native of the East Indies.

7. Ruellia Pallida; *Pale-leaved Ruellia.* Leaves petioled, ovate, wave-crenate, rugged at the edge; flowers axillary, solitary, sessile, large and violet-coloured.—Native of the West Indies. See the first species.

8. Ruellia Clandestina; *Covert-flowered Ruellia.* Leaves petioled; peduncles three-flowered, long, subdivided, naked; root perennial, composed of many fleshy fibres.—Native of Barbadoes, where it is called *Snap-dragon,* from the bursting of the seed-vessels. It flowers here in July and Augnst. See the first species.

9. Ruellia Paniculata; *Panicled Ruellia.* Leaves almost entire; peduncles dichotomous, divaricate, panicled; root perennial; stems four or five feet high, much diffused; flowers at the divisions of the stem, small, purple, of short duration. The whole herb is somewhat clammy with glands, and has an odour approaching to that of camphor. Dr. Patrick Browne says, it is common about Spanish Town in Jamaica, and in many other parts of the low lands, where it generally blows in the months of December and January, making a

very beautiful appearance among the bushes in that festive season of the year; and hence the civilized natives call it *Christmas Pride*. Being a weakly plant, it seldom rises above a foot or two if alone; but when supported, runs frequently three or four feet, and bears a great number of bright blue flowers.—Native of Jamaica, on dry hills and hedges in the southern parts. See the first species.

10. Ruellia Intrusa. Leaves petioled, ovate, hairy; flowers in spikes, directed all one way; stem herbaceous; corolla violet-coloured, pubescent on the outside.—Native place not ascertained.

11. Ruellia Tuberosa; *Tuberous-rooted Ruellia*. Leaves ovate, crenate; peduncles one-flowered. The roots are composed of many swelling tubers, which run deep into the ground. The flowers are produced on the side and at the end of the stalk; those on the side have two flowers at each peduncle, which come out opposite at each joint, but those at the top sustain three: they are of a fine blue colour, but seldom last in beauty through the day. This plant is very common in most parts of Jamaica, where it is called *Menow-weed, Spirit-weed*, and *Snap-dragon;* the last name makes it probable that it has sometimes been confounded with the eighth species. It seldom exceeds twelve or sixteen inches in height. The roots (which when fresh have a little pungency, and are quite insipid when dry) are frequently used by the negroes in fevers. See the first species.

12. Ruellia Tentaculata. Leaves obovate; whorls surrounded with unarmed two-forked spines.—Native of the East Indies.

13. Ruellia Ciliaris. Leaves toothed, ciliate; flowers opposite.—Native of the East Indies, and Cochin-china.

14. Ruellia Biflora; *Two-flowered Ruellia*. Flowers twin, subsessile. This is an herbaceous perennial, flowering in July.—Native of Carolina.

15. Ruellia Crispa; *Curl-leaved Ruellia*. Leaves subcrenate, lanceolate, ovate; heads ovate; leafy, hispid; stem creeping. This plant is a suffrutex, and has the appearance of Rhinanthus Crista Galli, or Yellow Cock's Comb.—Native of both Indies, and of China. See the first and fourth species.

16. Ruellia Fasciculata; *Aggregate-flowered Ruellia*. Leaves petioled, oblong, toothed; petioles winged; flowers aggregate, terminating, and lateral; stems herbaceous, filiform, weak, decumbent, angular, with decurrent lines, alternately branched, jointed; the joints rough-haired.—Found in woody places near the hot-baths of Trincomalee, in Ceylon.

17. Ruellia Mollissima; *Soft Ruellia*. Leaves petioled, broad lanceolate, quite entire, very soft; flowers in bundles.—Native of Madagascar.

18. Ruellia Undulata; *Wave-leaved Ruellia*. Leaves petioled, oblong, waved; heads axillary, sessile; stem erect; flowers clustered in alternate heads.—Found by Kœnig in the East Indies.

19. Ruellia Involucrata; *Involucred Ruellia*. Leaves lanceolate, quite entire, smooth; heads terminating, involucred, hairy; stem upright, obscurely four-cornered by four decurrent lines, two of the sides wider and more convex, with short branches, some alternate, others opposite; flowers imbricate, in a shortly peduncled head, the size of a hazel-nut; calicine segments five, unequal, linear, acute.—Native of the East Indies. See the first species.

20. Ruellia Repanda; *Repand-leaved Ruellia*. Leaves lanceolate, bluntly toothed, petioled; stem creeping.—Native of Java.

21. Ruellia Ringens; *Ringent-flowered Ruellia*. Leaves oblong, quite entire; flowers solitary, sessile; stem procumbent.—Native of the East Indies, Ceylon, and China.

22. Ruellia Antipodia. Leaves mucronate, serrate; stem creeping; flowers subspiked, terminating in fives or threes. This has the appearance of Veronica Officinalis, or of Verbena Nodiflora, but is much smaller.—Native of the East Indies, China, and Cochin-china. See the first species.

23. Ruellia Repens; *Creeping Ruellia*. Leaves lanceolate, acuminate, quite entire; flowers sessile; bractes petioled, longer than the calix; stem creeping.—Native of the island of Tanna.

24. Ruellia Littoralis; *Maritime Ruellia*. Shrubby, hoary: leaves wedge-form, serrate, retuse, smooth; flowers axillary, solitary, subsessile.—Found near Madras in the East Indies, on the coast; where it is very common after the lands have been inundated in rainy seasons.

25. Ruellia Longiflora; *Long-flowered Ruellia*. Leaves ovate, quite entire; flowers axillary, solitary, very long; stem shrubby.—Native place unknown.

26. Ruellia Difformis. Diffused, hirsute: leaves linear; tooth-sinuate, entire; flowers in whorls, axillary.—Native of the East Indies.

27. Ruellia Barbata. Leaves lanceolate, quite entire; flowers in whorls; calices acute; bractes oblong; stem upright.—Native of the East Indies.

28. Ruellia Salicifolia. Leaves lanceolate, quite entire flowers in whorls; calices awned; bractes lanceolate; stem upright.—Native of the East Indies.

29. Ruellia Balsamica. Erect, smooth: leaves petioled, lanceolate, serrate; whorls sessile.—Native of the East Indies; where it is very common in the rice-fields, especially when the rice-harvest is over. It has a strong smell of turpentine.

30. Ruellia Uliginosa. Diffused, hirsute: leaves sessile, oblong, entire; spikes terminating, four-cornered.—This small plant flowers in January and February, and is very common in the rice-fields of Tranquebar.

31. Ruellia Hirta. Rough-haired: leaves oblong, petioled, serrate; spikes terminating, imbricate; stem creeping.—Native of the East Indies.

32. Ruellia Pilosa. Leaves opposite, ovate, entire, ciliate; flowers terminating, solitary.—Native of the Cape.

33. Ruellia Depressa. Leaves opposite, petioled, obovate, entire; stem closely depressed.—Native of the Cape.

34. Ruellia Cordifolia. Leaves cordate-ovate, sessile, tomentose, hoary beneath; flowers subspiked; stem shrubby; branches jointed.—Native of the East Indies.

35. Ruellia Secunda. Leaves subcordate, ovate, quite entire, villose; racemes axillary, directed one way.—Native of the East Indies.

36. Ruellia Japonica. Leaves elliptic; flowers in spikes; bractes oblong, blunt.—Native of Japan.

37. Ruellia Guttata. Leaves ovate, lanceolate, rugged at the edge, and waved; spikes terminating, imbricate.—Native place unknown.

38. Ruellia Imbricata. Leaves petioled, ovate, wave-crenate, the opposite one less; spikes imbricate, directed one way; stem suffruticose; the flowers are white and nocturnal.—Native of Arabia Felix, the East Indies, and the Isle of France.

39. Ruellia Aristata. Leaves ovate, hoary beneath; head terminating; calices and bractes nerved, awned; stem shrubby.—Native of Arabia.

40. Ruellia Alopecuroidea. Leaves ovate, smooth, obscurely repand; spikes terminating, hairy; stem creeping, herbaceous.—Found in Montserrat.

41. Ruellia Reptans. Leaves petioled, ovate, blunt, bluntly serrate; peduncles terminating, subspiked.—Native of the Island of Tanna, in the South Seas.

42. Ruellia Fragrans. Leaves sessile, oblong, bluntly serrate; flowers axillary, solitary, sessile.—Native of Otaheite.

43. Ruellia Rupestris. Stemless: leaves petioled, oblong, crenate-waved; scapes erect, many-flowered. Doubtful whether of this genus.—Native of Hispaniola.

44. Ruellia Hybrida. Plant erect, very branchy; hairs hoary; leaves subsessile, oblong, subacute on both sides, very rough; bractes shorter than the calix; segments of the calix linear, scarcely shorter than the tube of the corolla.—Grows in sandy fields near Savannah.

45. Ruellia Ciliosa. Plant erect, branchy: leaves subsessile, ovate-oblong; the nerves and veins ciliated with white hairs; bractes lanceolate, short; segments of the calix subulate, four times shorter than the tube of the corolla.—Grows near Savannah, Georgia.

46. Ruellia Humistrata. Plant somewhat glabrous, diffuse, radicant: leaves oval, obtuse; flowers subsessile; capsules linear.—Grows in Georgia and Florida.

Ruizia; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth double: outer three-leaved; leaflets ovate, concave, acute, deciduous; inner one-leafed, five-parted, permanent; segments lanceolate. *Corolla:* petals five, sickle-shaped towards the right, rounded at the tip, entire, flat, spreading, fastened to the pitcher of the stamina. *Stamina:* filamenta many, (from thirty to forty, shorter than the corolla, united below into a pitcher, surrounding the germen; antheræ oblong, incumbent. *Pistil:* germen globular, ten-grooved; styles ten, short; stigmas simple. *Pericarp:* capsules ten, compressed, membranaceous, woody on the back, boat-shaped, one-celled, united into a globular umbilicate whorl. *Seeds:* two, roundish, three-sided, acuminate. *Observe.* This genus is nearly allied to *Assonia.* Essential Character. *Calix:* double; the exterior three-leaved. *Styles:* ten. *Capsules:* ten, one-celled, two-seeded, closely cohering.——The species are,

1. Ruizia Cordata; *Heart-leaved Ruizia.* With cordate, lanceolate, spreading leaves. This is a branching shrub.—Native of the isle of Bourbon, where it flowers in the months of March and April. Flowers sulphur-coloured.

2. Ruizia Lobata; *Lobated Ruizia.* With heart-shaped, five-lobed, crenated leaves. This is a handsome shrub, with a grayish-white bark, five or six feet high, with spreading and fragile branches, which, when grown very old, almost equal the thickness of a man's thigh. The flowers are sulphur-coloured, and grow in umbel-like corymbs, like the first species.—Native of the isle of Bourbon, where it is found flowering in January, February, and March.

3. Ruizia Variabilis; *Variable Ruizia.* With palmate and digitate leaves. This is a low spreading tree, or shrub; the stems wavy, furrowed, brown; leaves alternate, stalked, extremely curious for the variety of their shape; flowers in umbel-like corymbs, of a pale red or crimson colour, with deep red claws.—Native of the isle of Bourbon.

Rumex; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* perianth three-leaved; leaflets obtuse, reflex, permanent. *Corolla:* petals three, ovate, bigger than the calix, and like it, converging, permanent. *Stamina:* filamenta six, capillary, very short; antheræ erect, twin. *Pistil:* germen turbinate, three-sided; styles three, capillary, reflexed, standing out between the clefts of the converging petals; stigmas large, laciniate. *Pericarp:* none; corolla converging, three-sided, enclosing the seed. *Seed:* single, three-sided. *Observe.* The twenty-fourth species excludes one-third part of the number in all parts of the fructification, except the stamina. The thirty-first species, and its varieties, have the male and female flowers on the separate plants. The twenty-seventh species has the flowers of both sexes on the same plant, with the female perianths hooked. The twenty-sixth species is polygamous. In some species a callose grain is fastened externally to the valves of the petals. Essential Character. *Calix:* three-leaved. *Petals:* three, converging. *Seed:* one, three-sided.——The species are,

* *Hermaphrodites; having the Valves marked with a grain.*

1. Rumex Patientia; *Patience Dock,* or *Rhubarb.* Flowers hermaphrodite; valves quite entire, one of them graniferous; leaves ovate-lanceolate. Root large, dividing into many thick fibres, which run downwards; stems from four to six feet high, dividing towards the top into several erect branches, having a few narrow leaves on them; and terminated by spikes of large flowers which appear in June.—Native of Italy; also of Hesse, and some other parts of Germany. The herb was formerly used in the kitchen by the name of Patience; and also in medicine, as the twenty-sixth species: it is now wholly neglected, and very seldom found in any gardens.——All the Docks rise easily from seeds, and, if introduced into a garden, will become troublesome weeds if permitted to scatter; therefore few persons care to propagate any of them, except for their use in medicine or the kitchen. The seeds should be sown in autumn soon after they are ripe. When the plants come up, thin them and keep them clean. They all delight in a rich moist soil, but being very injurious to agriculture, render it necessary to ascertain how they may be most effectually destroyed. Mr. Curtis asserts it to be a false notion, that whilst any part of a Dock remains the plant will grow again; and therefore insists that the use of the docking-iron is unnecessary, but that frequent mowings effectually destroy it, and that frequent spudding would probably have the same effect, though, unless it be done carefully, and at stated periods, little good is to be expected. It cannot be denied that frequent mowing and spudding may in the end destroy Docks; at least it will prevent one great evil, by keeping them from seeding; but it appears equally certain that pulling up the young plants by hand after a ground rain, and using the docking-iron for old plants, or those which have been mown or spudded, which will not come up by hand, is a far more effectual remedy. Fallow deer keep down Docks by biting them close to the roots. Mr. Marshall mentions an instance of a bed of Docks being destroyed by swine, or by mowing. The fact was, a large patch of Docks, as thick as they could grow upon the ground, was liable to the swinish bite, (for some hogs will greedily feed on these plants,) and what the swine left was repeatedly mown, perhaps twice or thrice in a summer, for a succession of years, until they wholly vanished, as by a charm, and were succeeded by a thick sward of the finer Grasses. But perhaps the fact is, that neither the swine nor the scythe could be strictly said to have killed these Docks, which evidently died of old age. No vegetable is everlasting, and the age of perennial plants respectively has not been ascertained. We may, however, take it for granted, that all plants which propagate their species by seeds alone, may be subdued by persevering to prevent their seeding. All that we want to obtain is, their several ages, in order to calculate the difference of expense between heading them from time to time, and destroying them at once by eradication.—Docks mature their seeds rapidly and in great abundance, but having no wings to scatter them at a distance, they fall at the foot of the plant. This renders a creeping root unnecessary. Nature's chief care seems to have been to establish the parent plant firmly in the soil, and to guard against its destruction. To this end it is furnished with a very strong tap-root; which,

if divided below the crown, sends forth sapling shoots from the part left in the ground, and this from almost any depth, provided it have head-room and the soil be loose. The upper part too, if cut a few inches deep, will survive the amputation. Even when inverted by the plough, it will recoil, and find its way to the surface again. Hence land much infested with Docks should be gone over with the drawing or docking iron some time before the plough be put to it, that the tops may be removed, and the rootlets left in the ground may have time to rot before the land be ploughed. With this precaution, and with a person to follow the plough with a spadelet, to grub up the bottoms, and disengage the tops of such as may have escaped the previous weeding, the roots may be extirpated with great certainty. The seeds are to be destroyed by the plough, the harrow, and the roller; but the intervals between the ploughings should be short, for if they once establish themselves in the soil, except in favourable seasons, it is impossible to extirpate them. These weeds are sometimes sown upon the land with corn, and frequently with Clover. From corn and pulse the seed may be separated by the screen, and still more effectually by the sieve; but from Clover seed, the seed of Docks cannot easily be separated, being nearly of the same size and weight. Singular caution should therefore be had in purchasing Clover seed; and the growers of Clover should be especially assiduous in clearing their seed Clover from this pernicious weed. To suffer a Dock which has ripened its seed to be thrashed with seed Clover, is an unpardonable neglect, almost amounting to an actual crime.

2. Rumex Sanguinea; *Bloody-veined Dock*, or *Bloodwort*. Flowers hermaphrodite; valves quite entire, oblong, one chiefly graniferous; leaves cordate, lanceolate. Root fusiform; stem upright, branched, angular, leafy, smooth, three or four feet high; florets small, in long clusters of very numerous tufts of whorls, their petals oblong and obtuse, one of them bearing a very large, globular, red grain. The veins and petioles of the leaf abound in a blood-coloured juice. The variety called the *Green-veined Dock*, which is so common in shady places, only differs in the colour of the veins. Hill says, that the roots of this plant are of an astringent nature, and may be given either in decoction or powder, against the bloody and other fluxes; also in spitting of blood, immoderate menses, and fluor albus.—This plant is said to be a native of Virginia. It was first found in England in the woody places about Hampstead, and has been since observed about Maidstone; on Headington Hill near Oxford; at Lowestoft in Suffolk; about Bristol; and near Harefield in Middlesex.

3. Rumex Spathulatus; *Spatula-leaved Dock*. Leaves obovate, obtuse; valves graniferous.—Native of the Cape.

4. Rumex Verticillatus; *Whorl-flowered Dock*. Flowers hermaphrodite; valves quite entire, all graniferous; leaves lanceolate; sheathes cylindrical.—Native of Virginia.

5. Rumex Britannica; *Virginian Water-Dock*. Fowers hermaphrodite; valves quite entire, all graniferous; leaves lanceolate; sheaths obsolete. The root is black or yellow on the outside, and saffron-coloured within.—Native of Virginia.

6. Rumex Crispus; *Curled Dock*. Flowers hermaphrodite; valves ovate, entire, all graniferous; leaves lanceolate, waved, acute. Root fusiform, yellow; stem two or three feet high, angular, grooved, smoothish. This is the pest of the Clover-fields in Norfolk, in some of which it has been known to constitute half the crop. It is distinguished by its yellow root, waved leaves, and large seed-coverings. The fresh roots bruised, and made into an ointment or a decoction, cure the itch. The seeds have also been successfully given in dysentery.—Native of Europe, Siberia, Cochin-china; found in every soil and situation. See the first species.

7. Rumex Persicarioides; *Persicaria-leaved Dock*. Flowers hermaphrodite; valves toothed, awl-shaped at the tip, all graniferous; leaves lanceolate, wavy.—Native of Virginia.

8. Rumex Ægypticus; *Egyptian Dock*. Flowers hermaphrodite; valves trifid, setaceous, one only graniferous; leaves oblong.—Native of Egypt.

9. Rumex Dentatus; *Dentated Dock*. Flowers hermaphrodite; valves toothed, lanceolate at the tip, all graniferous; leaves lanceolate.—Native of Egypt.

10. Rumex Acutus; *Sharp-leaved Dock*. Flowers hermaphrodite; valves oblong, somewhat toothed, all graniferous; leaves cordate-oblong, acuminate; racemes leafy. Root perennial; stem angular, grooved, smooth, rather flexuose.—Native of Europe, in woods, hedges, by road-sides, in watery places and marshes. There is a variety which is more twisted, the whorls are more frequent and denser, and the leaflets under the whorls shorter. It is common in moist places. See the first species.

11. Rumex Obtusifolius; *Blunt-leaved Dock*. Flowers hermaphrodite; valves toothed, one chiefly graniferous; root-leaves cordate, blunt; stem somewhat rugged. This is subject to as little variety as any of the species; its broad root-leaves readily distinguish it, and these, though they may differ somewhat in size, vary little in shape; in general the younger the plant, the more obtuse are its radical leaves. Of all the English Docks, this is one of the most common; and may be considered as a very pernicious weed, being very large and spreading, and refused by cattle in general. The leaves were formerly much used for wrapping up butter, from which it obtained the name of *Butter Dock*.—Native of Europe, in all sorts of cultivated ground; among rubbish in farm-yards and courts; by the side of ditches and paths: flowering in July and August. See the first species.

12. Rumex Pulcher; *Fiddle Dock*. Flowers hermaphrodite; valves many-toothed, one chiefly graniferous; root-leaves viol-shaped; stem smooth, divaricate. The root-leaves, so remarkably contracted in one part as to resemble a fiddle; the widely spreading stems and branches; and the sharp numerous teeth of the strongly reticulated valves, clearly mark this species.—Native of Italy.

13. Rumex Maritimus; *Golden Dock*. Flowers hermaphrodite; valves deltoid, setaceous-toothed, graniferous; leaves linear; whorls clustered. Root perennial, consisting of twisted fibres as in winter plants.—Native of the several parts of Europe, in marshes, especially on the sea-coast.

14. Rumex Palustris; *Yellow Marsh-Dock*. Flowers hermaphrodite; valves lanceolate, graniferous, toothed at the base; leaves linear-lanceolate; whorls distant. Root tapering, reddish brown on the outside, bright red within. The most striking character of this plant, when in flower or seed, is the number and narrowness of the leaves on its branches; when viewed more closely, we are struck with the number and length of the teeth on the edges of the seed-valves, which valves are frequently, though not always, of a yellowish colour, and furnished with remarkably large and long grains: if any doubt remain respecting the species, the root, on being cut across, exhibits a beautiful red colour equal to any carmine. It flowers in July, August, and September, and is one of the species least noxious to the farmer. Its natural situation is a moist one, as on the edges of wet ditches and rivulets; but it is not unfrequent in pastures or drier ground. In the former it will grow to the height of three or four feet; having root-leaves a foot long, and three inches broad; in the latter it seldom grows more than a foot high, with root-leaves about

six inches long, and one inch, or somewhat more, broad. This species is common about London, and is found in many parts of England.

15. Rumex Crispatulus. Plant hermaphrodite; little valves obtusely heart-shaped, cristated on both sides, tridentated, one naked, two unequally graniferous; spikes aphillous; lower leaves oval; upper leaves lanceolate; all the leaves undulated.—A native of Kentucky.

16. Rumex Aquaticus; *Water Dock.* Flowers hermaphrodite; valves ovate, entire, naked; according to Smith, obsoletely graminiferous; leaves cordate-lanceolate, acute. Root large, striking deep in the mud, perennial; stems erect, four or five feet long, angular, and strongly furrowed, leaves a foot or more long, and four inches broad in the middle.—Native of Europe, in ditches, pools, and on the banks of streams. The leaves, which manifest considerable acidity, are said to possess a laxative quality, and have therefore been used to obviate costiveness. The roots have been much employed both externally and internally for the cure of scurvy, especially when the gums are spongy, and bleed. It is also recommended in cutaneous irruptions, and in visceral obstructions, though many physicians think it does not peculiarly differ from other astringents. It is, however, admitted by most medical men, that a decoction of the root is of great efficacy, either used externally as a wash for putrid spongy gums, or taken inwardly in that and other scorbutic disorders. It is likewise serviceable in the rheumatism, and in lingering complaints arising from obstructions in the viscera. The powdered root is an excellent thing to clean the teeth with, and may be freely used without endangering the enamel.

** *Hermaphrodites; having the valves destitute of a grain, or naked.*

17. Rumex Bucephalophorus; *Basil-leaved Dock.* Flowers hermaphrodite; valves toothed, naked; pedicels flat, reflexed, incrassated; root conical, yellow, fibrous.—Found in various parts of Spain, Barbary, and Italy; flowering in May. This plant grows freely from seeds sown in a bed of light earth in the spring, and kept perfectly free from weeds.

18. Rumex Lunaria; *Tree Sorrel.* Flowers hermaphrodite; valves even; leaves subcordate; stem suberous. The flowers come out in loose panicles towards the ends of the branches; they are of an herbaceous colour, and sometimes succeeded by triangular seeds within smooth covers; but the seeds rarely ripen in England.—Native of the Canaries. This is easily propagated by cuttings planted during any of the summer months, in a bed of loamy earth, and shaded from the sun until they have taken root. Then take them up and plant them in pots filled with kitchen-garden earth, placing them in the shade till they have taken new root; after which move them to a sheltered situation with other hardy green-house plants till autumn, when they must be removed into the green-house, and treated in the same way as other plants requiring protection from frost.

19. Rumex Vesicarius; *Bladder Dock*, or *Sorrel.* Flowers hermaphrodite; stalks mostly in pairs; all the valves very large, membranaceous, reflexed; leaves undivided. A hardy annual.—Native of the Canary Islands.

20. Rumex Roseus; *Rose Dock.* Flowers hermaphrodite, distinct; the wing of one of the valves very large, membranaceous, netted; leaves gnawn. The whole herb roughish, with a sort of hoary mealiness. Annual.—Native of Egypt and Barbary.

21. Rumex Tingitanus; *Tangier Dock.* Flowers hermaphrodite, distinct; valves cordate, blunt, quite entire; leaves hastate, ovate. Root perennial; flowers in clustered whorls, nodding.—Native of Spain and Barbary.

22. Rumex Scutatus; *French Sorrel.* Flowers hermaphrodite, small, racemose, pendulous; leaves cordate-hastate; stem round; root hard, fibrous, perennial. This has a more grateful acid than Common Sorrel, and is therefore preferred for kitchen use, in soups, especially by the French.—Native of Germany, Switzerland, Italy, the south of France, and Barbary. This is a great runner at the root, by which it is easily propagated. The roots should be planted at the distance of two square feet. It will agree better with an open situation than the common sort. If the flowers, stems, and rambling branches, be cut off in the beginning of July, the roots will soon put out new leaves, which will be tender and much better for kitchen use than the older leaves; so that by cutting down the shoots of some plants at different times, there will always be a supply of young leaves.

23. Rumex Nervosus; *Three-nerved Dock.* Flowers hermaphrodite; valves quite entire, naked; leaves oblong, three-nerved; stem suffruticose.—Found in Arabia.

24. Rumex Digynus; *Mountain Sorrel.* Flowers hermaphrodite, two-styled; valves ovate, entire, naked; leaves broadly emarginate.—Native of the mountains of Lapland, England, Wales, Scotland, Switzerland, Silesia, Dauphiny, Piedmont, and Siberia. Found in Westmoreland and Cumberland; in Yorkshire; also upon Snowden in North Wales; also upon rocks by the sides of rivulets, which fall down from the highland mountains of Scotland; and in the isles of Rum and Skye. It requires a moist soil in a northern border.

25. Rumex Lanceolatus; *Lance-leaved Dock.* Leaves lanceolate, reflex, margined; stem angular.—Native of the Cape of Good Hope.

*** *With declinous, or male and female Flowers, separate.*

26. Rumex Alpinus; *Alpine Dock*, or *Monk's Rhubarb.* Flowers barren, hermaphrodite and female; valves quite entire, naked; leaves cordate, obtuse, wrinkled. This plant obtains its name from having been formerly used for the same purposes as the true Rhubarb. It has a very large perennial or biennial root, three or four inches in thickness, branched, woody, yellow within, running horizontally. The stem is two feet high, erect, leafy, round, furrowed, smooth; and has the appearance of Rhubarb, with nearly the same qualities in a less degree, so that a double dose must be taken to produce the same effects.—Native of France, Switzerland, Silesia, Piedmont, and Siberia. This is as hardy as the Common Sorrel, and may be increased either by planting the seeds or parting the roots. The plants ought to be at least a foot distance from each other, especially in good ground. The leaves are large and succulent, and, having a pleasant acid taste, are very suitable for kitchen use.

27. Rumex Spinosus; *Prickly-seeded Dock.* Flowers androgynous; female calices one-leafed; outer valves reflexed and hooked. Stem decumbent. It is an annual plant.—Native of the island of Candia or Crete.

28. Rumex Tuberosus; *Tuberous-rooted Dock.* Flowers dicœcous; leaves lanceolate, sagittate; hooks spreading; root with oval knobs.—Native of Italy.

29. Rumex Multifidus; *Multifid-leaved Dock*, or *Sorrel.* Flowers dicœcous; leaves hastate, with the earlets palmate.—Native of the mountains of Calabria, Tuscany, and the Levant.

30. Rumex Thyrsoides; *Thyrse-like Dock*, or *Sorrel.* Flowers dicœcous; panicle contracted in manner of a thyrse; leaves hastate.—Native of Barbary.

31. Rumex Acetosa; *Common Sorrel.* Flowers dicœcous; valves graniferous; leaves oblong, awl-shaped, their lobes converging, sometimes notched. Root perennial, running deep into the ground; stem mostly simple, erect, round,

striated, leafy, from one to two feet high; clusters compound or aggregate, whorled, reddish; flowers drooping. The root is astringent; and the whole herb acid, with a considerable degree of pleasant and wholesome astringency. Taken in considerable quantity, it is said to be of important advantage where a refrigerant and antiscorbutic regimen is required. The leaves are eaten in sauces and salads. The Laplanders use them to turn their milk sour. In France it is cultivated for the use of the table, being introduced into soups, ragouts, fricassees, &c. In some parts of Ireland they eat the leaves plentifully with milk, also with fish and other alkalescent food. The dried root affords a beautiful red colour when boiled. All domestic cattle will eat the plant.—It is common in meadows and pastures in the greater part of Europe, in almost all soils and situations; flowering early in June. The variety called Great Mountain Sorrel grows larger, but preserves its difference. It is found upon the Alps, and has been seen in Wales. It is commonly cultivated in gardens, where, though small in the fields, it will produce fair large flowers.—Sow the seeds early in the spring in a shady moist border; and if the plants be afterwards removed into another shady border, at the distance of four or six inches square, they will produce larger leaves, and continue longer.

32. Rumex Acetosella; *Sheep's Sorrel.* Flowers dicœous; valves grainless; leaves lanceolate, hastate. This is only half the size of the preceding species, more slender in every part, and more of a red or tawny colour; root creeping, perennial.—Native of Europe, in dry and sandy pastures, banks and fallows, gravel walks, &c.

33. Rumex Aculeatus; *Prickly Dock*, or *Candia Sorrel.* Flowers monœcious; fruits reflexed; valves ciliate; leaves lanceolate, petioled.—Native of Candia.

34. Rumex Luxurians; *Luxuriant Dock*, or *Buckwheat-leaved Sorrel.* Flowers monœcious; outer valves awl-shaped; inner orbicular; leaves cordate-hastate; stem angular, diffused.—Native of the Cape of Good Hope.

35. Rumex Arifolius; *Halbert-leaved Dock.* Flowers dicœous; all the leaves petioled, hastate, with simple divaricate earlets; stem upright.—Native of Africa. It becomes six feet high when cultivated in the open ground.

36. Rumex Bipinnatus; *Bipinnate-leaved Dock.* Flowers dicœous; leaves bipinnate. Root perennial; stem ascending, a span long, simple, leafy.—Native of Morocco.

37. Rumex Hostilis. Flowers dicœous; valves naked; leaves lanceolate, entire; stem prickly.—Native of Cochinchina; where it is called *Cây diè gai.*

Rumphia; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, trifid, erect, flat. *Corolla:* petals three, oblong, obtuse, equal. *Stamina:* filamenta three, awl-shaped, the length of the corolla; antheræ small. *Pistil:* germen roundish; style awl-shaped, the length of the stamina; stigma three-cornered. *Pericarp:* drupe coriaceous, turbinate, three-grooved. *Seed:* nut ovate, entire, three-celled. Essential Character. *Calix:* three-cleft. *Petals:* three. *Drupe:* coriaceous. *Nut:* three-celled.——The only known species is,

1. Rumphia Amboinensis. Leaves alternate, petioled, cordate, acute, toothletted, rugged; flowers white, in axillary clusters. This is a lofty tree, with an ash-coloured bark.—Native of the East Indies.

Rupala; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* petals four, oblong, narrow at the base, blunt, concave above, convex beneath, deciduous. *Stamina:* filamenta four, very short, inserted into the petals; antheræ oblong, obtuse; when the flower is closed, concealed in the cavity of the petal; when the corolla is expanded, erect. *Pistil:* germen roundish, surrounded at the base with glands; style filiform; stigma subovate. *Pericarp:* one-celled. *Seed:* one. Essential Character. *Calix:* none. *Petals:* four, cohering at the base. *Stamina:* inserted into the middle of the petals. *Pericarp:* one-celled, one-seeded ——The species are,

1. Rupala Montana. Leaves ovate, petioled; branches round, smooth, with a brown bark, scarred from the fall of the leaves and peduncles.—Native of Cayenne.

2. Rupala Sessilifolia. Leaves cuneate-oblong, sessile.—Native of Cayenne.

Ruppia; a genus of the class Tetrandria, order Tetragynia.—Generic Character. *Calix:* spathe besides the sheaths of the leaves, scarcely any; spadix subulate, quite simple, straight, when the fruit ripens curved inwards, fenced in a double row by the fructifications. *Perianth:* none. *Corolla:* none. *Stamina:* filamenta none; antheræ four, sessile, equal, roundish, subdidymous. *Pistil:* germina four or five, subovate, converging; style none; stigmas blunt. *Pericarp:* none. *Seeds:* four or five, ovate, oblique, each elevated on a long slender stalk, and terminated by a flat orbicular stigma. Essential Character. *Calix:* none. *Corolla:* none. *Seeds:* four, pedicelled.——The species is,

1. Ruppia Maritima; *Sea Ruppia*, or *Tassel Pondweed.* Leaves scarcely distich, rather alternate, very long and slender, pointed. The spike emerges from the water, and therefore the peduncle or flower-stalk is of very different lengths, according to the depth of the water.—Native of several parts of Europe, in salt-water ditches. In Great Britain, it has been found between Malden and Goldhanger in Essex; in the isle of Shepey; near Yarmouth; near the mouth of the Tees; in Cornwall; and in Scotland at Glen Elgin in Inverness-shire. It flowers in July.

Rupture Wort. See *Herniaria.*

Ruscus; a genus of the class Dicœcia, order Syngenesia.—Generic Character. *Male. Calix:* perianth six-leaved, from erect spreading; leaflets ovate, convex, with the lateral margin reflexed. *Corolla:* petals none, unless the alternate calix-leaves be called so; nectary central, ovate, the size of the calix, inflated, erect, coloured, perforated at the top. *Stamina:* filamenta none; antheræ three, spreading, placed on the top of the nectary, itself united at the base. *Female. Calix:* perianth as in the male. *Corolla:* petals as in the male. Nectary as in the male. *Pistil;* germen oblong-ovate, concealed within the nectary; style cylindric, the length of the nectary; stigma obtuse, prominent beyond the mouth of the nectary. *Pericarp:* berry globular, three-celled. *Seeds:* two in each cell, globular. *Observe.* The fifth species has hermaphrodite flowers, in which the calix is globular, with the mouth six-cleft only. Essential Character. *Calix:* six-leaved. *Corolla:* none. *Nectary:* central, ovate, perforated at the top. *Female. Style:* one. *Berry:* three-celled. *Seeds:* two.——The species are,

1. Ruscus Aculeatus; *Prickly Butcher's Broom, Knee Holly, Hulm, Holm*, or *Hulver.* Leaves ovate, mucronate, pungent, above floriferous, naked. Roots thick, white, twining about each other, putting out frequent fibres like those of Asparagus, oblique, striking deep in the ground; stem suffruticose, tough, stiff, green, round, striated, from eighteen inches to three feet in height, sending out from the side many short stiff branches. The female flowers are succeeded by berries, which are red, bigger than those of Asparagus, and almost as large as some Cherries, of a sweetish taste, having two large orange-coloured seeds in each, gibbous

on one side, flat on the other, and extremely hard. The flowers come out in March and April, and the seeds ripen in winter. The root has a bitterish taste, and was formerly much recommended as an aperient and diuretic, in dropsies, urinary obstructions, and nephritic cases. Riverius relates a case of dropsy, successfully treated by a decoction of the roots. Bauhin and others give strong cases of its effects in dropsy. The young shoots, in the spring, are sometimes gathered and eaten by the poor, like those of Asparagus; and the branches, with the ripe fruit on them, were formerly stuck up in sand, with the stalks of Male Peony, and Wild Iris, or Gladwyn, full of their ripe seeds, which altogether made a show in rooms during winter. When planted under trees or shrubs it will spread into large clumps; and as it retains its leaves all the winter, will have a good effect. The green shoots of this plant are cut, bound into bundles, and sold to the butchers for sweeping their blocks; whence its principal English name. It is very frequently made into besoms in Italy; where the hucksters place the boughs round their bacon and cheese, to defend them from the mice.—Native of Europe, but not so far north as Sweden; also of Asia and Africa. In England, it is not uncommon in woods, thickets, and hedges; it has been observed at Black Notley in Essex; in the woods of Berkshire; in Hethel woods, near Norwich; near Lowestoft, in Suffolk; near Stony Cross in the New Forest, Hampshire; at Anglesey Abbey, in Cambridgeshire; between Caversham and Maple, Durham; in the woods of Oxfordshire; near Feversham, Kent; on the heaths about Woolwich; about Harefield, Middlesex; on Hampstead Heath; and at Norwood, Surry.—There is a variety with longer, more lax branches, and elliptical leaves, tapering at each end; but there are many intermediate states which connect it with the common kind.—This, with the next species, and also the third and fifth species, being very hardy, and thriving in almost any soil and situation, are very proper for planting round the verges of close woods, or under large trees in wilderness quarters; and as they are always green, make a good appearance in winter after the deciduous trees have cast their leaves. They are easily increased by parting their roots in autumn; but when this is performed, if they are divided into small parts, it will weaken them so, that they will make little figure, until they have had two or three years' growth. They may also be propagated by the seeds; but that being tedious, is seldom attempted.

2. Ruscus Hypophyllum; *Broad-leaved Butcher's Broom.* Leaves floriferous underneath, naked. The roots have large knotty heads, with long thick fibres, like those of the preceding: flowers in May and June.—Native of Italy and Africa.

3. Ruscus Hypoglossum; *Double-leaved Butcher's Broom.* Leaves floriferous on the upper side, beneath the leaflet. Root like the preceding; stems about ten inches high; the flowers are of a pale yellow colour; the berries are almost as large as those of the first sort; they are red, and ripen in winter. It flowers in April and May.—Native of Italy, Idria, Hungary, and Africa, in the neighbourhood of Algiers.

4. Ruscus Androgynus; *Climbing Butcher's Broom.* Leaves floriferous at the edge; stem twining, branched. This differs from the other species, in having androgynous flowers divided into six equal segments to the bottom, but falling off in one piece, and arising from the edge, and not the disk of the leaf.—Native of the Canaries. It flowers most part of the summer, and being tender, must be planted in pots filled with fresh earth, and in winter removed into the green-house, and placed where it may have free air in mild weather, for it only requires to be screened from frost, and in summer must be set abroad with other hardy green-house plants. With this management the plants will send forth stems six or eight feet high, furnished with leaves from bottom to top, and in June will be closely set with flowers upon their edges, which make a very beautiful and singular appearance, and entitle it to a place in every good collection of plants. This species is propagated by parting the roots as the former, which should not be done very often; because if the roots are not permitted to remain some time to get strength, they will produce but weak shoots, and very few flowers; and in the strength of their shoots, and the number of their flowers, their principal beauty consists. It may also be propagated from seeds; but the seeds commonly lie in the ground a year before the plants come up, so they should be sown in pots filled with fresh earth, and placed under a hot-bed frame in winter, to screen the seeds from the frost, and in the following spring the plants will appear.

5. Ruscus Racemosus; *Alexandrian Laurel.* Raceme terminating, hermaphrodite; stem erect, branched. The stalks are slender, and rise about four feet high. The flowers are in terminal clusters, pale buff or cream-coloured; the berries are orange-coloured.—This most elegant shrub should appear in the front of all ornamental plantations. It is one of the plants supposed to have been used by the ancients to crown their conquering generals, and the victors at the public games: the stalk being very pliable, might readily answer the purpose; and the leaves bear some resemblance to those represented on ancient busts.

Rush. See *Juncus.*

Rush, Flowering. See *Butomus.*

Rush, Sweet. See *Acorus* and *Andropogon.*

Russelia; a genus of the clash Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth of one leaf, five-parted, permanent; leaflets ovate, concave, acuminate, small, erect. *Corolla:* one-petalled, ringent; tube cylindric, compressed a little, erect, very long, internally under the lower lip hairy; border two-lipped; upper lip roundish, flat, emarginate, spreading, with the tip reflexed; lower lip trifid; segments oblong, obtuse, flat, spreading very much, a little longer than the upper. *Stamina:* filamenta four, filiform, erect, a little shorter than the tube, two of them longer; antheræ ovate. *Pistil:* germen ovate; style filiform, erect, the length of the shorter stamina; stigma globular. *Pericarp:* capsule roundish, pointed by part of the style, which is permanent, one-celled, two-valved, the length of the calix. *Seeds:* numerous, very small. Essential Character. *Calix:* five-leaved, setaceous at the end. *Corolla:* tube very long, hairy at the throat; border two-lipped; lower lip trifid. *Capsule:* acuminate, one-celled, two-valved, many-seeded. ——The species are,

1. Russelia Sarmentosa. Leaves ovate, nearly sessile; stalks axillary, three-flowered. Stem shrubby, with numerous long leafy branches, requiring support; flowers handsome, of a fine red colour, but without scent, almost an inch over.—Found in close coppices and woods at the Havannah.

2. Russelia Rotundifolia. Leaves sessile, heart-shaped, roundish; clusters many-flowered, axillary and terminal, in pairs. Flowers scarlet.—Found near Acapulco.

3. Russelia Multiflora. Leaves ovate, pointed, stalked, cluster terminal, whorled, compound. Corolla scarlet.—Grows in South America.

Ruta; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, short, permanent. *Corolla:* petals five, spreading, subovate, concave, with narrow claws. *Stamina:* filamenta ten, awl-shaped, spreading, the length of the corolla, widish at the base; antheræ erect, very short. *Pistil:* germen gibbous.

inscribed with a cross, surrounded at the base by ten honey dots, raised on a receptacle, punctured with ten honey pores; style erect, awl-shaped; stigma simple. *Pericarp:* capsule gibbous, five-lobed, half five-cleft, five-celled, opening into five parts between the tips. *Seeds:* very many, rugged, reniform, angular. *Observe.* The first species, in all the flowers except the primary one, loses a fifth of every part of the fructification; and the third species has the petals fringed at the base. ESSENTIAL CHARACTER. *Calix:* five-parted. *Petals:* concave. *Receptacle:* surrounded by ten honey dots. *Capsule:* lobed.——The species are,

1. Ruta Graveolens; *Common Rue.* Leaves superdecompound; leaflets oblong, the end one obovate; petals quite entire. Root woody, branched; stems frutescent, covered with a rugged, gray, striated bark, eighteen inches high and more; branches, especially the young ones, smooth, and pale green; flowers of a pale dull yellow colour, copious, in terminal corymbose panicles. The varieties are, the Common Broad-leaved Rue, the Narrow-leaved Rue, and the Variegated-leaved Rue.—Native of the south of Europe, and flowering from June to September. It was much used by the ancients. Hippocrates commends it as a resolvent and diuretic, and attributes to it the power of resisting contagions and poisons, which is now very little credited, though so highly extolled by Boerhaave. It is unquestionably a powerful stimulant, and may be considered, like other medicines of the fetid kind, as having attenuating, deobstruent, and antispasmodic powers; and as peculiarly adapted to phlegmatic habits, or weak and hysterical constitutions, suffering from retarded or obstructed secretions. The whole plant has a strong, and rather disagreeable smell; if the leaves are rubbed on the skin, they inflame the part, and some people make use of them in this manner to cure the headache. The tops of the young shoots contain the greatest virtues of any part of the plant. An infusion of them may be taken in the manner of tea, or they may be beaten into a conserve with three times their weight of sugar, and taken in that form. The infusion is good in feverish complaints; it raises the spirits, promotes perspiration, and expels the matter which occasions the disease. The conserve is good against the headache, nervous and hysteric disorders, weakness of the stomach, and pains in the bowels. It is likewise serviceable in suppressions of the menses, and disorders occasioned thereby; and, taken for a considerable time, has been found beneficial to those troubled with the epilepsy, or falling sickness. The expressed juice, taken in small quantities, is a remedy for that troublesome nervous complaint, the nightmare. It is a good thing to snuff up the nose for such as are obliged to go among putrid and contagious disorders.—*Culture.* All the plants of this genus may be propagated either by sowing their seeds, or by planting slips or cuttings; both of which may be done in the spring. The manner of propagating them from cuttings, being the same as for Lavender, Stœchas, and other hardy aromatic plants, need not be here repeated. It is the most expeditious method of raising these plants, as every slip or cutting of the young wood will readily grow, and is the only method by which the varieties can be continued distinct. If they are propagated by seeds, there needs no further care but to dig a bed of fresh earth in the spring, making it level; then to sow the seed thereon, and rake the ground smooth; after which, keep the beds clear from weeds, until the plants are come up about two inches high, when they should be transplanted out into fresh beds, where they may remain for use. It was formerly used to plant for edgings on the side of borders; but it was by no means proper for this, for the plants shoot so vigorously, that there is no keeping them within the bounds of an edging: besides, when they are kept closely sheared, they appear to be very ragged and stumpy, and their roots spread so far as to exhaust the goodness of the soil, so that the other plants are deprived of their nourishment; which has caused it to be wholly neglected for this purpose, so that at present it is cultivated for medicinal use, or to furnish the balconies for the citizens in the spring, especially that with a variegated leaf. All the sorts of Rue will live much longer, and are less liable to be injured by frost in winter, when they grow in a poor dry rubbishy soil, than in good ground.

2. Ruta Montana; *Mountain Rue.* Leaves superdecompound; all the leaflets linear; petals quite entire. The flowers grow at the ends of the branches in loose spikes, which are generally reflexed. It flowers in August and September.—Native of the south of Europe, and Barbary. This, and the next species are tenderer than the common sort, so require shelter in winter.

3. Ruta Chalepensis; *African Rue.* Leaves superdecompound; leaflets oblong, the end one obovate; petals ciliate-toothed. This is very like the first species, but has larger flowers; the petals are hollowed like the bowl of a spoon, with great flatted hairs, like eye-lashes, round them. They smell insupportably strong.—Linneus having observed that Rue moves one of its stamina every day to the pistil, Dr. Smith examined this species, which differs very little from the Common Rue, and found many of the stamina in the position which he describes, holding their antheræ over the stigma; while those which had not yet come to the stigma were lying back upon the petals, as well as those which, having already performed their office, had returned to their original situation. Trying with a quill to stimulate the stamina, he found them all quite destitute of irritability: they are stout, strong, conical bodies, and cannot without breaking be forced out of their natural position. The same phenomenon has been observed in several other flowers; but it is no where more striking, or more easily examined, than in the Rue. It flowers from June to September.—Native of Africa and the East Indies.

4. Ruta Pinnata; *Wing-leaved Rue.* Leaves pinnate; leaflets lanceolate, attenuated at the base, serrate-crenate; petals somewhat notched. It flowers in March.—Native of the Canary Islands.

5. Ruta Patavina; *Three-leaved Rue.* Leaves ternate, sessile; stamens hairy; germen crested. The root is woody, and perennial; stems several, a foot high, branched at the base only; flowers five-cleft, in a terminal, dense, corymbose panicle; petals of a pale dull yellow, with a green central rib.—Discovered in Italy near Padua. This is propagated by seeds sown in autumn soon after they are ripe. The plants will come up in the following spring; whereas when the seeds are sown in the spring, the plants seldom rise in the same year. On poor ground, or among rubbish, in a warm situation, it will live in the open air without covering; but in winter is often killed in rich ground.

6. Ruta Linifolia; *Flax-leaved Rue.* Leaves simple, lanceolate, smooth; filamenta ciliate; stem simple, herbaceous.—Native of Spain and Tunis. This will live through the winter in the open air, on a poor dry soil, and will perfect seeds the second year; but as it is of short duration, young plants should be raised annually to keep up a succession.

7. Ruta Fruticulosa; *Shrubby Rue.* Leaves simple, linear, spatulate, pubescent; filamenta woolly. Stem branched, shrubby. The flowers are only half the size of those of the preceding species.—Native of Syria, near Damascus.

Ruyschia; a genus of the class Pentandria, order Mono-

gynia.—Generic Character. *Calix:* perianth five-leaved, permanent; leaflets roundish, concave, blunt, converging, imbricate, augmented at the base by a three-leaved involucre; one leaflet bent down, difform. *Corolla:* petals five, ovate, flattish, blunt, reflexed, three times as long as the calix. *Stamina:* filamenta five, awl-shaped, flat, patulous, shorter than the petals; antheræ oblong, incumbent. *Pistil:* germen ovate, roundish; style none; stigma quadrangular, cruciform, flat. *Pericarp:* berry four-celled? *Seeds:* many. *Observe.* Aublet remarks, that the stigma is five-rayed, and the pericarp five-celled; according to Swartz, the pericarp is two-celled, many-seeded. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled, reflexed. *Style:* none. *Berry:* many-seeded.——The species are,

1. Ruyschia Clusiefolia. Leaves obovate, obtuse, veinless. This is a parasitical undershrub; racemes terminal, quite simple, erect, many-flowered; petals purple, deciduous.—Native of Martinico, in the vast moist woods; flowering in April.

2. Ruyschia Souroubea. Leaves obovate, obtuse, mucronate, veined. Stem sarmentose, round, with long, divaricate, flexile, declining, fragile branches; racemes terminating, simple, long, many-flowered; corolla golden yellow.—Native of the woods in Guiana, by the river Gallion.

Ryania; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, permanent, five-leaved; leaflets lanceolate, attenuated, spreading, very finely nerved, coloured. *Corolla:* none; nectary between the germen and stamina, pitcher-shaped, very villose, the height of the germen. *Stamina:* filamenta numerous, (sixty,) in a double row, a little shorter than the calix, awl-shaped, having a few hairs scattered at the base, in other parts smooth; antheræ erect, awl-shaped, three times shorter than the filamenta, torulose, mucronate, smooth, after the pollen is discharged waved above the edge. *Pistil:* germen ovate, very villose; style smooth, the length of the stamina; stigmas four, convex. *Pericarp:* berry suberous, elliptic, spheroid, brown, scrobicular; receptacles five, formed out of the sides of the berry, suberous, oblong, attenuated both ways, having minute tubercles scattered over them in transverse rows. *Seeds:* abundant, ovate, subglobular, having a few minute hairs scattered over them, brown, arilled; aril incomplete, covering the base and belly of the seed, membranaceous, three-winged, and the wings doubled. Essential Character. *Calix:* five-leaved, permanent, coloured. *Corolla:* none. *Stigmas:* four. *Berry:* suberous, one-celled, many-seeded.——The only known species is,

1. Ryania Speciosa. A tree, with ash-coloured round branches, finely downy towards the ends. Leaves alternate, a span long, elliptic, oblong, acuminate, smooth on both sides, obliquely nerved, entire; the midrib underneath mealy; the nerves raised, and between these very fine, simple, transverse veins; flowers axillary, mostly solitary; berry larger than a walnut; seeds as large as Coriander-seeds.—Found in the island of Trinidad.

Rye. See *Secale.*

Rye-Grass. See *Hordeum,* and *Lolium.*

SAC

SACCHARUM; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume two-valved, one-flowered; valves oblong-lanceolate, acuminate, erect, concave, equal, awnless, surrounded with a long lanugo at the base. *Corolla:* two-valved, shorter than the calix, sharpish, very slender; nectary two-leaved, very small. *Stamina:* filamenta three, capillary, the length of the corolla; antheræ somewhat oblong, pendulous. *Pistil:* germen oblong; styles two, capillary; stigmas cylindrical, plumose. *Pericarp:* none, the corolla investing the seeds. *Seed:* single, oblong. *Observe.* In this genus the wool is without the calix; in Arundo, it is with it. Essential Character. *Calix:* two-valved, involucred, with a long lanugo. *Corolla:* two-valved.——The species are,

1. Saccharum Teneriffæ; *Teneriffe Sugar Cane.* Leaves awl-shaped, flat; flowers panicled, awnless, hairy; involucre none; calix very villose. This Grass is a foot high and more; culm jointed, with the joints approximating, leafed.—Native of the Island of Teneriffe.

2. Saccharum Spontaneum; *Wild Sugar Cane.* Leaves convolute; panicle effused; spikes capillary, simple; flowers in distant pairs, one of them peduncled. Culm twelve feet high, but not at all arborescent, the thickness of a goose-quill, even, covered by the sheath of the leaves, hollow; panicle large, and of a delicate silky aspect, white, except the purple anthers.—Native of Malabar, in watery places; and found in the Society Isles, common in the marshes and wet places: it creeps at the root, and thus diffuses itself far and wide, especially near rocks.

3. Saccharum Japonicum; *Japan Sugar Cane.* Leaves serrated; racemes in bundles; petals ciliate, the outer ones awned; culm six feet high, shrubby, simple, round, smooth; leaves linear-sword-shaped, smooth, with a thick rib. There is a variety of this, which is only three feet high.—Both are natives of Japan.

SAC

4. Saccharum Officinarum; *Common Sugar Cane.* Flowers panicled; leaves flat. Root jointed, sending forth four or more shoots proportionable to the age or strength of the root, and the goodness of the ground. The height is generally eight or ten feet, and in moist rich soil has been observed nearly twenty feet, but the latter canes were not so good as those of middling growth. The Sugar Cane is jointed, and the joints are more or less distant, in proportion to the quality of the soil. A leaf is placed at each joint, and the base of it embraces the stalk to the next joint above its insertion, before it expands; from thence to the point it is three or four feet in length, according to the vigour of the plant. There is a deep whitish furrow, or hollowed midrib, which is broad and prominent on the under side: the edges are thin, and armed with small sharp teeth, which are scarcely to be discerned by the naked eye, but will cut the skin of a tender hand if it be drawn along it. The flowers are produced in panicles at the top of the stalks; they are from two to three feet long, and are composed of many spikes nine or ten inches in length, which are again subdivided into smaller spikes, which have long down enclosing the flowers, so as to hide them from sight. The seed is oblong and pointed, and ripens in the valves of the flower. According to Loureiro, there are three remarkable varieties of this species, differing in the culm, not in the flower; the White Sugar Cane, with the culm long, white, of a middling size, very sweet, the knots distant; the Red Sugar Cane, with the culm short, thicker, red, very juicy, the knots approximate; and the Elephantine Sugar Cane, with the culm very thick, red, long, less sweet, the knots approximate.—It has been asserted, that the Sugar Cane is not indigenous of America, but that it migrated through the Europeans from Sicily and Spain to Madeira and the Canary Isles; afterwards to the West Indian Islands: and from thence to Mexico, Peru, and Brazil. On the discovery of the western hemisphere, however, the Sugar

Cane was found on the continent, and in some of the islands; but the art of making sugar, it is said, never was practised by the native inhabitants of the islands, or of South America. Of this there may be some doubt, as far as the account relates to Mexico: and it is certain that before the discovery of the West Indies in 1492, before the discovery of the East Indies by the Portuguese in 1497, and before the discovery of the Brazils by the same nation in 1500, abundance of sugar was made in the islands of Sicily, Crete, Rhodes, and Cyprus. The Sugar Cane is supposed to have been originally brought to these islands from India by the Saracens, and to have been from thence transplanted into some parts of Italy; while the Moors imported it from Africa into Spain, where it was first planted in Valencia, and afterwards in Granada and Murcia, in which provinces great quantities were formerly produced; and some is still cultivated in the two latter. From Valencia the cultivation and manufacture of sugar were carried by the Spaniards to the Canary Islands, in the 15th century; but prior to this period, the Portuguese, in 1420, carried the Cane and the manufacture from Sicily to Madeira. From Madeira, the culture of the Sugar Cane, and the art of making sugar were extended to the West India Islands and the Brazils; for it seems certain that the Sugar Cane itself was found growing in various parts of the American continent, and in some of the West India Islands, when they were first discovered; and that in Mexico and Peru the culture of the plant, and the art of manufacturing it into sugar, were well known. The Portuguese are said to have made sugar in the island of St. Thomas under the line, on the coast of Africa, much earlier than it was manufactured in the West Indies. The island of St. Thomas was discovered in 1405, and they had sixty-one sugar works on it before the Dutch destroyed them in the year 1610. In the Brazils, sugar was first made in the year 1580; and by the English at Barbadoes in the year 1643, and even then, they only manufactured muscovadoes, which were so moist and full of molasses, and so ill cured, as to be hardly worth sending to England, but they greatly improved it in the seven following years. Though the West Indies now chiefly supplies Europe with sugar, that plant was first brought to it from Arabia and the East Indies, or rather from the latter through the former. Dioscorides, Pliny, Galen, and Paulus Elgineta, all describe it as white like salt, brittle between the teeth, and sweet like honey. This description has been commonly supposed to belong to the *Tabaxir* noticed under *Arundo Bamboo*; but that was not sweet, and there is little doubt that the substance intended was crystallized sugar. Mosely observes, that there has always been two sorts of sugar made in the East, the raw or muscovado sugar, and sugar-candy: the first being appropriated for culinary purposes only, and the second for every other purpose of diet, luxury, and exportation. The former is, and we have reason to suppose ever has been, made in Bengal, and other districts of the East Indies: but China and Cochin-china seem to be the only countries in the East where the bright transparent sugar-candy is made in perfection. It is exported from China to every part of India, even where abundance of sugar is made, and Du Halde adds, it constitutes a great trade to Japan. Father Loureiro informs us, that sugar is cultivated to a much greater extent in Cochin-china than in China, and that crystallized sugar is exported from that country in great quantities. He thus describes the method of making it: The raw sugar being purified by putting it into conical earthen vessels with a thin stratum of moist clay on the top, and discharging the impurities through a small hole in the bottom; this whitened, or as we call it, clayed sugar, is dissolved in water over a fire, and boiled to the consistence of a thick syrup; it is then exposed in a cool place during the night, with some slender rods cut from the Indian Reed spread over it; the syrup, as it is condensed by the nocturnal cold, adheres to these rods, and is formed into beautiful crystals. None of the eastern nations much esteem any other sugar than this, which probably has its name from two Indian words *Shukur* and *Khand*, both which words signify sugar in general, though we have united them in the name *Sugarcandy*, and applied to sugar prepared in a particular way. The Asiatics use this kind of sugar in tea, coffee, and all other beverages; and the general preference given to this kind of sugar, may account for the art of refining it into loaves having been little practised in the East; that art was only discovered at the end of the fifteenth or beginning of the sixteenth century, and was first practised in England in the year 1544.—The sugar in common use is prepared from the expressed juice of the Cane, boiled with quick-lime or common vegetable alkali, to imbibe the superfluous acid. The boiling is repeated in smaller and smaller vessels, during which it is often necessary to scum the impurities, and employ additional alkali; when the juice acquires a due consistence, it is suffered to cool in a proper vessel, and the saccharine matter concretes into a crystalline mass. This, after being separated from the molasses, is sold under the name of brown or moist sugar. It may be purified in conical moulds, by spreading on the upper broad surface some moist clay, which gradually transfuses its moisture through the mass of sugar, and carries with it a considerable part of the remaining treacly matter: it is then called clayed sugar. Loaf sugar is prepared in this country from the other sugar boiled in water, lime-water, and bullock's blood or eggs, commonly both being added to it, in order to clarify it, by incorporating with the oily and mucilaginous parts, and forming a scum, which is carefully taken off; then, after sufficient clarification, it is strained through a woollen cloth, and boiled again until it becomes of a proper consistence; it is then poured into a refrigeratory, and when duly cooled, into conical clay moulds, perforated at the apex, which is placed downwards; at first this aperture is stopped up, but as the sugar concretes it is opened, in order that the syrup or molasses may drain off. By this draining the cone of sugar shrinks at the base below the edges of the mould, which, to render the loaf still whiter, is filled up with moist clay, closely applied to the base of the sugar cone: lastly, the cone is placed upon its base, taken out of the mould, wrapped in paper, and dried or baked in a close oven.—Two centuries have scarcely elapsed since it can be properly said that sugar has become an ingredient in the popular diet of Europe. There are now very few persons who do not mix more or less of it in their daily food; excepting the remote and poor population of the interior and northern parts. It is very difficult to ascertain when it was first brought into England, but it was in use here in 1466, though only at feasts, and in medicine. The quantity consumed has always continued to increase, until it has become the staple article of our colonial commerce.—Sugar is manifestly a neutral saline substance, consisting of a peculiar acid, united to a small quantity of alkali, and much oily matter. It crystallizes in hexedral truncate prisms; and affords by distillation an acid phlegm, with a few drops of empyreumatic oil; the residue is a spongy light coal, which contains a small quantity of vegetable alkali. Dissolved in water, it undergoes fermentation, and acquires first a vinous, then an acetous flavour. The vinous liquor distilled, yields a strong ardent spirit, well known under the name of Rum. Bergman separated the acid of sugar, and exhibited it in a crystalline form.

But this acid is found in a variety of other substances, not only vegetable, as gums, resins, galls, starch, salt of sorrel, lemon juice, spirit of wine, &c. but animal; Berthollet having obtained from wool more than half its weight of this acid. Sugar, or the saccharine matter, may be extracted from most vegetables, particularly the *Maple*, the *Birch*, *Beet*, *Parsneps*, and from the *Grape*, which see; but the Sugar Cane affords it in larger quantities, and more readily, than any other. Sugar, when first introduced, was used only in medicine. Even in Arabia, in Avicenna's time, though sugar was an article of commerce from the East, there is no record of its having been used for dietetic or culinary purposes, for several centuries afterwards. Its principal use was to render unpleasant and nauseating medicines grateful to the sick; and in pharmacy, in syrups, electuaries, confections, and conserves. As a medicine, sugar itself cannot be considered as possessing much power. Dr. Cullen classes it with the attenuants; and Bergius states it to be saponaceous, edulcorant, relaxing, pectoral, vulnerary, antiseptic, and nutritive. In catarrhal affections both it and honey are frequently employed; it has been advantageously used in calculous complaints; and from its known power in preserving animal and vegetable substances from putrefaction, it has been given with a view to its antiseptic effects. Sugar-candy, or barley-sugar, by dissolving slowly in the mouth, are well suited to relieve tickling coughs and hoarseness, and the use of sugar in various medicinal compositions, is too obvious to require being particularly pointed out.—*Propagation and Culture.* The Sugar Cane is preserved by way of curiosity in several gardens in England, but, being too tender to thrive here unless it be preserved in a warm stove, it cannot arrive to great perfection. It is here propagated by slips taken from the sides of the older plants; those which grow near the root, and have fibres to them, will most likely succeed, so that when the shoots are produced at some distance from the ground, the earth should be raised about them, that they may put out fibres before they are separated from the mother plant. These slips should be planted in pots filled with rich kitchen-garden earth, and plunged into a moderate hot-bed of tanner's bark, being careful to shade them from the sun until they have taken new root, after which they must be treated in the same way as other tender plants from the same countries. They must constantly be kept plunged in the tan-bed in the stove, which should be kept in winter to the same temperature of heat as for the Pine-apple, and they must have plenty of free air admitted in hot weather.—*Cultivation in the West Indies:* The manner of preparing the stiff soils in the West Indian Islands for sugar, is, to burn the trash and weeds upon it, as soon as the Canes are cut down; the ashes being a proper manure, as the best compost for such land as ashes, sand, and rotten canes. This land should always be hoe-ploughed, and, after continuing about a month in this state, it should be *holed*. The cane-holes should not be very deep, so as to bring up the stiff clay. It is better to hoe-plough the bottoms of the cane-holes just before throwing in the manure; and if they are not planted soon after, the manure should be covered with a little mould, taken from the sides of the banks. The plants must be laid dry, and not more than two inches below the surface, unless it be necessary to plant in dry weather, which necessity rarely occurs. In light soils such as sand, gravel, and all poor dry moulds, with limestone or rock of any kind under it, the trash and weeds should be dug into the ground at the time of hoeing. No ploughing is necessary; but labour is best bestowed in preparing and carrying on good rich manure, without which these light soils will never make a proper return to the planter. The manure must be laid on heaps to ferment and rot, and if it is not arrived at a sufficient state of putrefaction at the time of planting, it may be distributed to the young plants when they are a foot or eighteen inches above the ground. This should be done in rainy weather, that the salts may the sooner penetrate to the roots of the young Canes. In these soils you must plant either very early or very late. If you plant in May or June, which is termed spring planting, and the weather proves favourable, the plants may be fit to cut in April or May following. But, wherever situation, dry weather, lateness of crop, or a deficiency in the strength of labourers and cattle, prevent this early planting, the month of December may be the best time, or even early in January. In light soils you can hardly make your cane-holes too deep, and the business of planting may succeed immediately to that of holing. The land which is most proper for the growth of Sugar Canes, is such as has a sufficient depth of soil, and is not too moist and strong, but rather light, and easy to work; for although strong moist ground will produce much taller and bigger canes than the other, yet the quantity of sugar will be much less, and of a worse quality, beside requiring a greater quantity of fuel, and a longer time to boil, before the sugar can be made; which is also the case with all fresh land, where there has not been any Canes growing before; therefore many of the most expert planters burn their land, when it is first cleared for planting of Canes, to abate its fertility; but if, when land is first cleared of the wood, and the roots of bad weeds, it is sown with Indigo, which such fresh ground will produce much better than the old, or such as has been long cultivated, there may be two or three crops of this taken, which will prepare the land for the Sugar Canes, without being at the trouble of burning it; but the growing of Indigo has been so little practised in the British Islands of America for many years past, as to be esteemed unworthy the notice of a sugar-planter; whereas if they would sometimes change their crops to other species, they would soon find an advantage in the growth, not only of their Canes, but also of their other crops: however, the usual practice is to continue the Canes always upon the same land, as long as it will produce them, without changing the species, or allowing the ground a fallow to rest and recover itself: by this method there are some plantations so much exhausted, as that the crop of sugar will scarcely defray the expense of culture. Another thing should always be observed in the planting of fresh land with Canes, which is, to allow them more room than is generally done; for, in close planting, if the ground be strong, there will a greater number of shoots come out from each plant, and not having room to spread at bottom, they will draw each other up to a great height, and be full of watery juice, the sun and external air being excluded from the Canes, both of which are absolutely necessary to ripen and prepare the salts during the growth of the Canes. In those warm countries, the Canes are propagated by cuttings or joints, of proper lengths; these are from fifteen to twenty inches long, in proportion to the nearness of their joints or eyes. These cuttings are generally taken from the tops of the Canes, just below the leaves; but if they were chosen from the lower part of the Canes, where they are less succulent and better ripened, they would not produce so luxuriant shoots, but their juice would be less crude, and contain a greater quantity of salts, which will be obtained by less boiling than that of those Canes in the manner they are commonly planted: and it is by thus carefully propagating all kinds of esculent plants, either in the choice of the best seeds or cuttings, that most of the kinds have been so greatly improved

of late years. The time for planting Canes is always in the rainy season, and the sooner they are planted after the rains have begun to fall, the more time they will have to get strength, before the dry weather sets in; for when they have put out good roots, and are well established in the ground, they will not be so liable to suffer by the drought, as those which have but newly taken root. The season being come for planting, the ground should be marked out by a line, that the rows of Canes may be straight and at equal distances; but first, it will be proper to divide the piece into lands of sixty or seventy feet broad, leaving intervals between each, of about fifteen feet: these intervals, when the Canes are cut, are of great use for roads, in which the carriages may pass, to carry off the Canes to the mill; for where there is not such provision made, the carriages are obliged to pass over the heads of the Canes, to their great injury; besides, by these intervals the sun and air will have freer passage between the Canes, whereby they will be better ripened, and their juice will be fuller of salts. The middle of these intervals may be planted with Yams, or other esculent plants, which may be taken off before the Canes are cut, that the passages may be clear; but a path should be left on the sides of each land, for the more convenient riding or walking of the overseer of the plantation, to view and observe how the labour is performed. The common method of planting Canes is, to make a trench with a hoe, which is performed by hand; into this one person drops the number of cuttings intended for planting, at the distance the hills are designed; these are by other negroes placed in their proper position, then the earth is drawn about the hills with a hoe; all this is performed by hand: but if the right use of ploughs were well known in these countries, the work might be much better performed, and for less than half the expense; if instead of making a trench with a hoe, a deep furrow were made with a plough, and the cuttings properly laid therein, the ground would be deeper stirred, and there would be more depth for placing the Canes. If the ground is to be afterwards kept clean with the horse-hoe, the rows of Canes should be planted five feet asunder, that there may be room for the horse and plough to pass between them, and the distance of the hills from each other, should be two feet and a half, and but one Cane should be permitted to remain in each hill After the Canes are planted, and have made some shoots, the sooner the horse-plough is used, the better will the Canes thrive, and the ground will be easier kept clean from weeds; for if these are torn up when they are young, they will presently die; whereas, when they are suffered to grow large before they are disturbed, they are with great difficulty destroyed. The distance which is usually allowed in planting Canes, is from three to four feet, row from row, and the hills are about two feet asunder in the rows; in each of these hills they plant from four to seven or eight cuttings, which is a very great fault, and is the cause of their blight, so much complained of during late years; for if all these grow, which is often the case, they rob each other of their nourishment; and if a dry season happen before they have acquired strength, they are very soon stinted in their growth, and are then attacked by insects, which spread and multiply so greatly, as to cover a whole plantation in a little time; when this happens, the Canes are seldom good after, so that it will be the better way to root them entirely up, when they are so greatly injured, for they very rarely recover this disorder; because though the insects are not the cause of the disease, they nevertheless confirm it, and cause it to spread. Hence, instead of planting so many, if there were but one good cutting planted in each hill, or, to prevent miscarriage, two at most; and, if both succeeded, the weakest being drawn out soon after they had taken root, it would be found of great service to prevent these blights; and although the number of Canes will not be near so great from the same space of ground, yet the quantity of sugar will be full as much, and will require little more than a fourth part of the fuel usually required for boiling. As the growth of the Canes is promoted according to the cleanness of the ground, so there cannot be too much care taken to keep the Canes perfectly clear of weeds; and the beginning of this work soon will render it less troublesome, and it may be performed at a less expense than when it has been neglected for some time. When the plough is used, the earth, in the intervals, should be thrown up to the rows of Canes, first on the one side of the row, being careful not to disturb the roots of the Canes, as also not to bury their new shoots; and, in the second operation, the earth should be turned over to the other side of the rows, with the same care as before. By this turning and stirring of the land, it will be rendered looser, and the earthing of the plants will greatly strengthen them; so that from each hill there will be as many shoots produced as can be well nourished, and the sun and air will have free ingress among the rows, which will be of the greatest service to the Canes. When the Canes are from seven to ten feet high, and of a proportionate size, the skin smooth, dry, and brittle; if they are heavy, their pith gray, or inclinable to brown, the juice sweet and glutinous; they are esteemed to be in perfection. The time for cutting the Canes, is usually after they have grown six months: but there should not be a fixed period for this, for, in some seasons, and in different soils, there will be more than a month's difference in their maturity; and those who have made the experiment of cutting their Canes before they were ripe, and letting others stand till after they were ripe, have found the sugar made from the latter was much finer than that of the former, though the quantity was not quite so great. It has also been remarked, that those Canes which are cut towards the end of the dry seasons, before the rains begin to fall, have produced better sugar than those which are cut in the rainy seasons, when they are more replete with watery juice, and there has been much less expense of fuel to boil it, which is a material article in large plantations; therefore, the better the Canes are nourished in their growth, and the more sun and air is permitted to pass between the rows, the less expense will be incurred in boiling and preparing the sugar.—The great pests of the Sugar Cane, are the Cane-ants and the Blast, supposed to be occasioned by minute insects. Rats are also very destructive to it; as is also that most pernicious weed, the Knot Grass. It is thought by some, that rich oily manures, or a thick dressing of marl, is the best cure for the ants. But such are the ravages of these insects, that many Sugar plantations have been totally abandoned; and the best course which can be pursued in that case, is, where the situation is not too wet nor cold, to adopt the culture of Cotton. Blasts that come without the ants, may in the beginning be stopped by burning the parts affected; by washing the young plants with salt-water or weak lime-water; and a good season, that is, heavy showers, will sometimes put a stop to it. When it returns, the Canes should be planted thinner, to give them a free circulation of air: the quincunx mode of planting may in this case be adopted with advantage. And if the leaves affected are stripped off, and the diseased stems cut down and burnt to windward, and the roots covered with good fresh mould; this, with salt or lime water, may prove a cure for the greasy fly and yellow fly, as well as for those destructive worms called the borer and the grub.

5. Saccharum Polystachyon; *Many-spiked Sugar Cane.* Flowers panicled; spikes filiform, very long, fastigiate; florets remote. This plant is from three to four feet high; culm round, jointed, smooth; leaves sheathing, broadish, keeled, linear, smooth.—Native of the island of St. Kitts.

6. Saccharum Arundinaceum; *Reedy Sugar Cane.* Panicles clustered, with the peduncles divided; florets two together, one sessile, the other pedicelled; corollas three-valved, polygamous. Culms ten feet high, thick, half void, leafy; leaves wide, in whorls, approximating to the stem.—Native of the East Indies. Kœnig says, it is cultivated about hedges, and on the banks of pools, near Tranquebar. The Tamools call it *Pee-Carumbo*, or Devil's Sugar, by which it would seem they infer that Lucifer himself has a sweet tooth in his head. The entire culms are often used for the lower covering of roofs; but they are a harbour for serpents, lizards, and other reptiles.

7. Saccharum Benghalense; *Bengal Sugar Cane.* Panicles close, with the peduncles divided; florets two together, one sessile, the other pedicelled; corollas two-valved, hermaphrodite. This so closely resembles the preceding species, that it might be taken for the same: it differs in having the corollas two-valved, all the florets hermaphrodite, and the stigmas yellowish-brown.—Native of Bengal.

8. Saccharum Repens; *Creeping Sugar Cane.* Panicle patulous; florets two together, sessile, awned; leaves flat; sheaths hairy, culm a foot high, simple, ascending; calix smooth.—Native of Guinea.

9. Saccharum Ravennæ; *Italian Sugar Cane.* Panicle loose, with the rachis woolly; flowers awned; culm the thickness of the finger or thumb, upright, smooth; calix-glumes narrow, nearly equal, villose on the outside, with silvery hairs longer than the flowers. One glume of the corolla is longer than the other, with a short bristle-shaped awn. It is a very beautiful plant, and the Arabs make tobacco pipes of the straw.—Native of Italy, Provence, and Mount Atlas, on the banks of streams.

10. Saccharum Cylindricum; *Cylindric Sugar Cane.* Panicle spiked, cylindric; peduncles one-flowered; flowers awnless, two-stamined; leaves flat; joints bearded; roots long, slender, twisted, white; culm often branched at the base.—Native of the south of France, Italy, Sicily, Candia, Smyrna, Barbary, the East Indies, and New Holland.

11. Saccharum Thunbergii; *Thunbergian Sugar Cane.* Panicle spiked, cylindric; peduncles one-flowered; flowers awnless, two-stamined; leaves convolute; joints smooth. This is a very tall grass, with the panicle more contracted, and twice as long as in the preceding, with the wood rather yellowish; joints of the culm quite naked; flowers twice as big; corolla only half the size of the calix, thin, of a very shining white colour.—Native of the East Indies.

12. Saccharum Jaculatorium; *Dart Sugar Cane.* Stem hollow, simple; leaves very long, keeled; panicle spiked, oblong. The stem is ten feet high, hollow, with distant knots or joints.—Native of Cochin-china; where it serves to make darts.

Safflower, or *Bastard Saffron.* See *Carthamus.*

Saffron. See *Crocus.*

Saffron, Meadow. See *Colchicum.*

Sage. See *Salvia.*

Sage of Jerusalem. See *Phlomis.*

Sagina; a genus of the class Tetrandria, order Tetragynia. Generic Character. *Calix:* perianth four-leaved; leaflets ovate, concave, spreading very much, permanent. *Corolla:* petals four, ovate, obtuse, shorter than the calix, spreading. *Stamina:* filamenta four, capillary; antheræ roundish. *Pistil:* germen subglobular; styles four, awl-shaped, recurved, pubescent; stigmas simple. *Pericarp:* capsule ovate, straight, one-celled, four-valved. *Seeds:* numerous, very small, fastened to the receptacle. *Observe.* The second species varies with petalous and apetalous flowers; the third has the petals scarcely discernible; the fourth has the calix-leaves lanceolate, acuminate; and the fifth differs in several marks from its congeners. Essential Character. *Calix:* four-leaved. *Petals:* four, *Capsules:* one-celled, four-valved, many-seeded.——The species are,

1. Sagina Cerastoides; *Tetrandrous Pearlwort.* Stem diffused, dichotomous; leaves spatulate and obovate, recurved; fruiting peduncles reflexed; root fibrous, branched, annual; herb bright green, many-stemmed, branched, hirsute, somewhat viscid. The flowers expand only in clear weather. This plant more properly belongs to the genus *Cerastium.*—Native of Scotland, where it is found on sandy shores and rocks, on walls and rubbishy places, flowering in May and June. It was first observed by Dr. Smith on walls about Edinburgh, as well as on the Calton Hill and upon Arthur's Seat: and has since been found on Inch Heath and Inch Combe in the Frith of Forth, and also on the beach below Preston Pans.

2. Sagina Procumbens; *Procumbent Pearlwort.* Stems procumbent, smooth; leaves acute, with a minute bristly point; petals very short. Root fibrous, generally annual, but in shady places often perennial; peduncles axillary, solitary, longer than the leaves, one-flowered, nodding before the flowers open. Mr. Curtis remarks, that few plants assume greater variety of appearance than this, but that in all situations the singular appearance of the seed-vessels, placed on the calix like a cup on a saucer, will easily distinguish it. Being fond of a sandy and gravelly soil, it is a troublesome little weed in garden walks and paved courts, where it flowers and seeds during the whole summer.—Native of most parts of Europe, Siberia, and Japan, where it is found in barren pastures, &c.

3. Sagina Apetala; *Annual Small-flowered Pearlwort.* Stems almost upright, pubescent; leaves linear, bristle-pointed; petals obsolete. Root annual, small, and fibrous. This species is as regular an annual as the *Draba Verna*, which, like the preceding, continues green through the winter. The preceding is always procumbent; and when it grows, as it commonly does in moist situations, it mats and spreads on the ground. This is a smaller plant than the Procumbens, and much finer in its stalks; its leaves are also shorter by one half, and less succulent. It is not, as its trivial Latin name infers, perfectly apetalous, being generally with petals, which are so minute as almost to require a magnifier to render them visible. It is found in dry, barren, and open places, on walls, and in gravel walks, where it is a troublesome weed, and flowers in May and June. There is scarcely any plant which is quicker in ripening its seeds.—Native of England, France, Italy, and Germany.

4. Sagina Erecta; *Upright Pearlwort.* Stem upright, one or two flowered; calix-leaves acute; petals entire. Root annual, simple, fibrous. The whole herb is smooth and glaucous. The calix never opens far, so that the corolla is not suffered fully to expand. If the season proves dry, the stalk is generally simple; but if the ground be moist, it throws out many stalks, which first spread on the earth, and afterwards become upright. The fruit is altogether that of n Cerastium; but its entire petals, and the number of parts of the flower, by no means agree with that genus, nor does the habit correspond with either Cerastium or the other Saginas. It may probably constitute a distinct genus.—This is a little plant, of considerable neatness and elegance in its structure,

much stronger than either of the two preceding; growing frequently on dry gravelly pastures and heaths among grass, flowering in April and May.

5. Sagina Virginica; *Virginian Pearlwort.* Stem upright; flowers opposite; one flower terminating, and some opposite, each on its proper peduncle.—Found among moss on the brinks of springs in Virginia, where it is a native.

6. Sagina Maritima; *Sea Pearlwort.* Stems nearly upright, divaricated, smooth; leaves obtuse, without bristles; petals obsolete. An annual; with a fibrous root; the stems about four inches high, often purplish; flowers erect, much longer than the leaves.—Found at Bally-castle, near the Giant's Causeway, in Ireland.

Sagittaria; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flowers*, many. *Calix:* perianth three-leaved; leaflets ovate, concave, permanent. *Corolla:* petals three, roundish, blunt, flat, spreading, three times as large as the calix. *Stamina:* filamenta numerous, (more than twenty,) awl-shaped, collected into a head; antheræ erect, the length of the calix. *Female Flowers*, fewer, below the males. *Calix:* perianth as in the male. *Corolla:* petals three, as in the male. *Pistil:* germina numerous, compressed, collected into a head, gibbous outwards, ending in very short styles; stigmas acute, permanent. *Pericarp:* none; receptacle globular, collecting the seeds into a globe. *Capsule:* numerous, oblong, compressed, girt longitudinally with a membranaceous margin, which is wide, gibbous on one side, acuminate at both ends. *Seeds:* solitary, oblong. Essential Character. *Male. Calix:* three-leaved. *Corolla:* three-petalled. *Filamenta:* commonly twenty-four. *Female. Calix:* three-leaved. *Petals:* three. *Pistilla:* many. *Capsules:* numerous, inflated, single-seeded, not bursting.——The species are,

1. Sagittaria Sagittifolia; *Common Arrowhead.* Leaves arrow-shaped, acute. Root perennial, consisting of a tube fixed deeply in the mud; stem and petioles triangular, very spongy, by which they are supported in the water in consequence of the air generated within them: they discharge a white milky juice, an uncommon circumstance in aquatic plants. The bulb, or tuber, which fixes itself in the solid earth below the mud, constitutes a considerable part of the food among the Chinese, and upon that account they cultivate it. The roots are larger there than in the East Indies and America, where they are also eaten; but are neglected in Europe, probably on account of their acrid and caustic qualities. This plant varies much in size, and has leaves of different forms; hence several varieties and pretended species of old authors. Dr. Stokes remarks, that the flowers which are called male, have from one to five pistilla, and that there are none with stamina only. Dr. Smith says, that he has observed three or four pistilla in some of the male flowers; but whether they ever ripen is uncertain: they should therefore rather be called imperfect hermaphrodites. —Native of Europe, Siberia, China, Cochin-china, Japan, and Virginia, in pools, ditches, and slow streams; of which it is one of the most beautiful ornaments throughout England, flowering in July and August.

2. Sagittaria Obtusifolia; *Blunt-leaved Arrowhead.* Leaves arrow-shaped, obtuse. Stem branched; flower-stalks panicled. This differs from the preceding in having the anterior part of the leaves twice as wide.—Native of Asia.

3. Sagittaria Lancifolia; *Lance-leaved Arrowhead.* Leaves lanceolate-ovate. The stem grows very luxuriant in general, and rises frequently to the height of two or three feet above the foliage. The branches of the lower whorls seldom exceed three in number, and are commonly subdivided in the same manner themselves; but those of the higher order consist chiefly of five long simple flower-stalks, and those about the top of three only; fruit depressed.—Native of Jamaica and Cuba, in stagnant waters.

4. Sagittaria Acutifolia, *Sharp-leaved Arrowhead.* Leaves awl-shaped. This is of the same size as the first species.—Native of Surinam, in water.

5. Sagittaria Trifolia; *Three-leaved Arrowhead.* Leaves ternate.—Native of China.

6. Sagittaria Hastata; *Halbert-leaved Arrowhead.* Leaves oblong-lanceolate, sensibly acute, sagittate; lobes patent, lanceolate, very considerably acuminated; scape simple; flowers diœcous; bractes and calices subrotund, obtuse.—Grows in the old ditches of Pennsylvania.

7. Sagittaria Gracilis; *Slender Arrowhead.* Leaves linear, slightly obtuse, three-nerved, sagittate; lobes patent, linear, elongate, very finely acuminate; scape simple, with few flowers; flowers diœcous; bractes short, suborbiculate. The leaves of this plant are very slender, and about three inches long, measured from the beginning of the petiole.—Grows in bogs and ditches, from Pennsylvania to Virginia, particularly on the mountains, flowering in July and August.

8. Sagittaria Rigida; *Rigid Arrowhead.* Leaves narrow-lanceolate, carinated underneath, rigid, very acute; scape branchy; flowers monœcous, very numerous; petioles strong, stiff.—Grows on the still and deep waters of Oswego river, near the great falls, New York. This plant grows in a depth of more than seven feet water.

9. Sagittaria Simplex; *Simple Arrowhead.* Leaves linear-lanceolate, acute, angustated on the lower part; scape simple, with many flowers; flowers diœcous, from twelve to eighteen in a scape; bractes and calices rounded, obtuse.—Grows in the small ponds of New Jersey. The leaves of this plant are about six inches long, and half an inch wide.

10. Sagittaria Graminea; *Grassy Arrowhead.* Leaves linear, very long, three-nerved; scape simple, with few flowers; flowers monœcous; bractes oblong, obtuse.—Grows in Carolina.

11. Sagittaria Natans; *Floating Arrowhead.* Leaves natant, elliptic-lanceolate, obtuse, three-nerved, attenuated at the base, lowest ones subcordate; scape simple, with a few flowers; peduncles inferior, elongate; flowers small.—Grows in the rivulets of Lower Carolina.

Sago Tree. See *Cycas.*

Saintfoin. See *Hedysarum Onobrychis.*

Saint John's Bread. See *Ceratonia.*

Saint John's Wort. See *Hypericum.*

Salacia; a genus of the class Gynandria, order Triandria. —Generic Character. *Calix:* perianth one-leafed, five-parted, very short, spreading; segments ovate, acute, permanent. *Corolla:* petals five, roundish, sessile. *Stamina:* filamenta none; antheræ three, twin, divaricate at the base, placed on the apex of the germen. *Pistil:* germen roundish, larger than the calix; style very short, between the antheræ; stigma simple. *Pericarp:* berry one-celled, three-seeded. *Seeds:* roundish, even. Essential Character. Monogynous or one-styled. *Calix:* five-parted. *Corolla:* five-petalled. *Antheræ:* placed on the apex of the germen. *Style:* very short. *Stigma:* simple.——The species are,

1. Salacia Chinensis. Leaves quite entire, alternate. A shrub, with smooth, angular, purplish, or somewhat glaucous branches; leaves about two inches long, oval; flowers several together, small, on short simple stalks, axillary.—Native of China.

2. Salacia Cochinchinensis. Stem shrubby; leaves subserrate, opposite; flowers heaped, axillary, of a yellowish-red;

berry roundish, unequal, reddish, middle-sized, eatable.—Native of Cochin-china, among bushes.

Salicornia; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* four-cornered, truncate, ventricose, permanent. *Corolla:* none. *Stamina:* filamenta one or two, simple, longer than the calix; anthera oblong, erect, of two roundish lobes. *Pistil:* germen ovate-oblong; style simple, under the stamen; stigma bifid. *Pericarp:* none; calix ventricose, inflated. *Seed:* single. Essential Character. *Calix:* ventricose, entire. *Petals:* none. *Stamina:* one or two. *Seed:* one, covered by the calix.——The species are,

1. Salicornia Herbacea; *Herbaceous Marsh Samphire*, or *Jointed Glasswort.* Joints compressed, emarginate; internodes obconical; spikes peduncled, attenuated towards the top. Root small, fibrous, and annual; stem erect, now and then incurved, and inclining at the bottom, divided above into copious, opposite, nearly cylindrical, jointed branches, of a light bright green, smooth, very succulent, and full of a salt, bitterish, and mawkish juice. There are no leaves. Flowers small, about three, sessile and crowded, on each side of the base of every joint.—There are several varieties. Common on the coasts of Europe, Asia, Africa, and America, wherever the shore is flat and oozy. It flowers with us in August and September. The whole plant has a saltish taste, and is greedily devoured by cattle. Steeped in salted vinegar, the tender shoots are made into a pickle, which is taken for the true Samphire, or *Crithmum Maritimum*, which see: on this account it is called Marsh Samphire. See the third species.

2. Salicornia Perennans; *Perennial Jointed Glasswort.* Herbaceous, patulous: joints compressed at the top, emarginate, bifid; spikes axillary, in threes, peduncled; scales acute; root perennial.—Native of Siberia, in marshes.

3. Salicornia Fruticosa; *Jointed Glasswort.* Joints round, entire; internodes equal; spikes subsessile, cylindrical, obtuse; root woody, perennial; stem suffruticose, ascending, very much branched; branches and branchlets opposite and less fleshy. This, and the first species, are burnt, and from their ashes a fossile alkali is obtained, which is in great request for making soap and glass, and hence their names of *Glasswort* and *Saltwort.* It is chiefly made on the shores of the Mediterranean, where it is called Soda. The Tunisians collect these and other sea-plants, and, when they are almost dry, burn them in a pit made for the purpose. The French merchants purchase the salt, and send it to Marseilles for making soap. Linneus thought that there was no plant more adapted for making soda; but though the quantity of fossil alkali which it yields is very considerable, a great portion of it is mixed with the muriatic acid, and therefore it contains much common salt. Many other plants, however, are much used for this purpose; see *Salsola.*—Native of Europe and Africa. Found in England, near the isle of Shepey; at the isle of Grain, in the Thames; and on the shore all the way from Weymouth Turnpike to Rhodipole.

4. Salicornia Strobilacea. Stem prostrate, shrubby; joints abrupt, alternately spike-bearing; spikes cylindrical, short, opposite.—Native of the shores of the Caspian Sea.

5. Salicornia Virginica; *Virginian Jointed Glasswort.* Herbaceous, erect: branches quite simple.—It is distinct from the first species; and is found in Virginia.

6. Salicornia Indica; *Indian Jointed Glasswort.* Stem shrubby, diffuse, with numerous ascending branches; interstices club-shaped, compressed, abrupt; spikes cylindrical, with very short, closely imbricated, many-flowered joints; stamens two.—Found on the sea-shore near Tranquebar, also in New Holland.

7. Salicornia Arabica; *Arabian Jointed Glasswort.* Joints obtuse, thickened at the base; spikes ovate. This plant is burnt for making soda.—Native of Arabia and Barbary: observed also near Tripoli.

8. Salicornia Foliata; *Leafy Jointed Glasswort.* Leaves linear, alternate, embracing, and decurrent; branches alternate, almost simple.—Native of Siberia.

9. Salicornia Amplexicaulis; *Clasping-leaved Jointed Glasswort.* Leaves cordate, embracing; stem decumbent, frutescent at the base, nine inches in height, very much branched.—Found on the shores of a lake near Bardo, in Tunis.

10. Salicornia Caspica; *Caspian Jointed Glasswort.* Stem shrubby; branches filiform; joints bordered, dilated, crowded; spikes ovate.—Found in marshes near the Caspian Sea.

11. Salicornia Ambigua. Plant fruticulose, assurgent, irregularly branchy, pale green.—Grows in sedgy salt meadows, from New Jersey to Carolina. This species very much resembles Salicornia Fruticosa.

Salisburia; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flowers. Calix:* ament naked, filiform. *Corolla:* none. *Stamina:* filamenta scarcely any; antheræ incumbent, deltoid; cells connected only at the top. *Female Flowers*, solitary, on the same tree. *Calix:* perianth four-cleft, permanent. *Corolla:* none. *Pistil:* germen superior, roundish. *Pericarp:* drupe superior, globular. *Seed:* nut triangular; nucleus oval, narrowed at the base. Essential Character. *Male. Aments:* naked. *Antheræ:* incumbent, deltoid. *Female.* Solitary. *Calix:* four-cleft. *Drupe:* with a triangular shell.——The only known species is,

1. Salisburia Adiantifolia. This large and not inelegant tree is cultivated in China and Japan. It has been long admired for its handsome fan-shaped leaves cloven about half way from their summit; but they can by no means be termed two-lobed, that denomination requiring that segments should be rounded. See *Ginko.*

Salix; a genus of the class Diœcia, order Diandria.—Generic Character. *Male. Calix:* ament oblong, imbricate every way, (constructed of an involucre from the bud,) consisting of scales, one-flowered, oblong, flat, spreading. *Corolla:* petals none. *Nectary:* a gland, cylindric, very small, truncate, melliferous, in the centre of the flower. *Stamina:* filamenta two, straight, filiform, longer than the calix-scales; antheræ twin, four-celled. *Female. Calix:* ament and scales as in the male. *Corolla:* none. *Pistil:* germen ovate, attenuated into a style, scarcely distinct, a little longer than the scales of the calix; stigmas two, bifid, erect. *Pericarp:* capsule ovate-subulate, one-celled, two-valved; valves revolute. *Seeds:* numerous, ovate, very small, crowned with a simple hirsute pappus or down. *Observe.* In some species the male flowers have three or five stamina of unequal length; the first is the only species known to have hermaphrodite two-stamined flowers; the eleventh and twelfth have only one stamina to the flowers. Essential Character. *Male. Calix:* ament composed of scales. *Corolla:* none. *Nectary:* a melliferous gland. *Female. Style:* bifid. *Capsule:* one-celled, two-valved. *Seeds:* downy.—Linneus remarks, that the species of this genus are not to be arranged without extreme difficulty; that the soil and situation (marshy, sandy, mountainous, hot and cold) produced a considerable change in them, insomuch that botanists frequently hesitated whether they should pronounce many differences to constitute species or varieties only. It may, however, be of importance to remark generally, that this genus consists of trees or shrubs, from one inch to fifty feet in height, some few species of which are suffruticose, or even sub-

herbaceous, natives of temperate or very cold climates, and generally of a wet soil; that the leaves are deciduous, stalked, simple, and undivided, almost always alternate; the stipulas in pairs at the base of the footstalks, various according to the age of the tree, or luxuriance of the branch; and that the flowers and fruits are in separate, axillary, or terminating aments, or catkins, which, when young, are covered with a single scale like a veil.——The species are,

* *Leaves smooth, serrate.*

1. Salix Hermaphroditica; *Hermaphrodite Willow.* Leaves serrate, smooth; flowers hermaphrodite, two-stamined. This is distinguished from the Bay-leaved Willow, in having the upper surface of the leaves with scored, not with raised veins. —Native of Sweden, found in the neighbourhood of Upsal. *Propagation and Culture.* This, like all the Willows, may be easily propagated by cuttings or sets, either in the spring or autumn, but the spring should be preferred. They are of a quick growth: those which grow to be large trees, and are cultivated for their timber, are generally planted from sets, which are about seven, eight, or nine feet long; these are sharpened at their larger end, and thrust into the ground two feet and a half deep by the sides of ditches and banks, where the ground is moist, in which places they make a considerable progress, and are a great improvement to such estates, because their tops will be fit to lop every six or seventh year. This is the usual method now practised in most parts of England, where the trees are cultivated, as they are generally intended for present profit; but if they are designed for large trees, or are cultivated for their wood, they should be planted in a different manner; for those which are planted from sets of seven or eight feet long, always send out a number of branches towards the top, which spread and form large heads fit for lopping, but their principal stem never advances in height; therefore where regard is paid to that, they should be propagated by short young branches, which should be put almost their whole length in the ground, leaving but two, or at most three, buds uncovered; which, when they have made one year's shoot, should be all three cut off, except one of the strongest and best situated, which must be trained up to a stem, and treated in the same way as timber-trees. If these are planted with such design, the rows should be eight feet asunder, and the sets four feet distance in the rows; by planting them so close, they will naturally draw each other upward, and, when they are grown so large as to cover the ground and meet, they should be gradually thinned; so as at last to leave the rows twelve feet asunder, and the plants in the rows eight. When thus managed, the trees will grow to a large size, and often exceed the height of forty feet. When these cuttings are planted, it is usual to sharpen those ends to a point which are put into the ground, for the better thrusting of them in; but the best way is to cut them horizontally, just below the bud or eye, and to make the hole in the ground with an iron instrument. When the cuttings are put into the ground, it should be pressed close about them with the heel to settle it, and prevent the air from penetrating deeply. The after care must be to keep them clear from weeds the two first seasons, by which time they will have acquired so much strength, as to overpower and keep down the weeds; they will also require some trimming in winter, to take off any lateral shoots, which if suffered to grow, would retard their upright progress. The larger wood, if sound, is commonly sold for wooden heels for shoes, as also for turners for many kinds of light ware.

2. Salix Triandra; *Long-leaved Three-stamined Willow.* Three-stamined: leaves linear-oblong, serrate, smooth; germina pedicelled. The bark of the stem and branches, in this species, peels off spontaneously, almost like that of the Plane-tree. The branches are upright, long, slender, pliable, and tough, though somewhat brittle at their insertion, and their bark is brownish and smooth. The colour of the twigs is yellow. It is not usual for Willows to flower both in spring and autumn; which is often done by this species. It is naturally a tree thirty feet or more in height; but being one of the best Osiers for the use of the basket-makers, is generally cut and kept low. It may be admitted into ornamental plantations, the male catkins being very numerous, of a bright yellow colour, and of an agreeable scent. For this purpose the male tree should be preferred, because the females quickly shed their catkins, and make a litter. It flowers in April or May.—Native of many parts of Europe, as Britain, Germany, Switzerland, France, Flanders, Carniola, Piedmont, and Siberia. See the forty-fifth species. Withering prescribes the bark for the ague, in doses of one or two drachms; and Woodville is of opinion, that the bark of this species is more effectual than that of any other of this genus. Willows, says Scopoli, support the banks of rivers, supply bands or withs, feed a great variety of insects, rejoice the bees, yield abundance of fire-wood, drain marshy soils, and feed cattle with their leaves, which afford a succedaneum to Jesuit's bark. The uses of the Willow, including the Sallow and Osier, are thus minutely detailed by the venerable Evelyn; they are, says he, suitable for all kinds of basket work; the wood is used for pill-boxes, cart saddle-trees, gun-stocks, and half pikes, harrows, shoemakers' lasts, heels, clogs for pattens, forks, rakes, especially the teeth, perches, rafters for hovels, ladders, poles for hop-vines and kidney-beans; to make hurdles, sieves, lattices; for the turners in making great platters, small casks, and vessels to hold verjuice; for pales, fruit-baskets, cans, hives, trenchers, trays, boards for whetting table-knives, particularly for painters' scriblets, bavin, and excellent sweet firing without smoke. The wood, if peeled, and steeped in water for some months, will last a good while for poles. The ancient Britons made boats of wicker, covered with skins, with which they passed rivers and arms of the sea; and these boats were light enough to be carried by one man. Modern Britons wield Willow bats in their favourite and manly amusement of cricket.—The ancient Britons were noted for their ingenuity in weaving baskets, which they exported in large quantities: they were of elegant workmanship, and bore a high price, and are mentioned by Juvenal among the extravagantly expensive furniture of the Roman tables in his time:

"*Adde et bascandas, et mille escaria.*
"Add baskets, and a thousand other dishes."

That these baskets were manufactured in Britain, we learn from the following Epigram of Martial:

Barbara depictis veni bascauda Britannis,
Sed me jam mavult dicere Roma suam.
"A basket I, by painted Britons wrought,
"And now to Rome's imperial city brought."

3. Salix Pentandra; *Bay-leaved Willow.* Five-stamined: leaves elliptic-lanceolate, crenulate, smooth; germina smooth, subsessile. This species frequently grows to a tree ten or twelve feet high, with a trunk as large as a man's thigh; the twigs are of a reddish colour tinged with yellow. It is well known by its broad and odoriferous leaves, the serratures of which exude a copious yellow resin, and its numerous stamina, commonly about five to each flower. The catkins are very sweet-scented. It is much used in Yorkshire, for making the larger sort of baskets. The leaves afford a yellow dye; and the wood makes a crackling fire. The down of the seeds, mixed with a third part of cotton, has proved to be a very good substitute for cotton itself, and has been used for

stuffing cushions, wicks for candles, &c. Goldfinches, and some other birds, line their nests with the down of this and other species of Willow.—Native of several parts of Europe: found in Switzerland, Dauphiny, Piedmont, and Siberia. In Great Britain, it frequently occurs about Kendal in Westmoreland, and Bradford in Yorkshire. About Kilnsey and Carr end, Wensledale, where it is the most common species. Near Stafford, Bungay in Suffolk, Coombe wood, and Wimbledon in Surry. See the first species.

4. Salix Phylicifolia; *Tea-leaved Willow.* Leaves lanceolate, wave-crenate, smooth, glaucous underneath; stipules sublunate.—Native of Lapland, and the northern parts of Sweden; found also on the Highlands of Scotland, at Finlarig and Breadalbane, along with several other species.

5. Salix Nigricans; *Dark Broad-leaved Willow.* Leaves elliptic-lanceolate, crenate, smooth, glaucous underneath; germina pedicelled, lanceolate, acuminate, silky. The trunk scarcely rises to the height or form of a tree. It is called *Nigricans*, from the dark colour of its branches, as well as its black hue when dried, in which last respect it is not singular.—Native of Lapland; and found at Wrongay Fen in Norfolk, flowering in April, before the leaves appear; and not uncommon in the Osier grounds of other places.

6. Salix Laurina; *Shining Dark-green Willow.* Leaves elliptic, acute; toothlet serrate, smoothish, glaucous underneath; germina pedicelled, lanceolate, silky. This is very nearly related to the preceding species, but very distinct, its catkins being but half the size, and the stamina shorter, perfectly smooth, and not hairy at the base.—Found in Osier holts, and marshy grounds, flowering in April and May.

7. Salix Japonica; *Japan Willow.* Leaves serrate, smooth, lanceolate, glaucous underneath, the younger ones villose.—Native of Japan, where it flowers in March.

8. Salix Vitellina; *Yellow Willow.* Leaves serrate, ovate-lanceolate, acute, smooth above; serratures cartilaginous. This is a middle-sized tree, much branched at the top; branches upright.—Native of the most temperate parts of Europe. It is also common all over Russia, and is used for Palms at Easter, in the Greek churches. The shoots are used by basket-makers. The wood is white and very tough. The cotton will make ordinary paper, and may serve some of the purposes of genuine cotton. The bark may be used in dyeing, and medicinally in agues. See the second species.

9. Salix Amygdalina; *Broad-leaved Three-stamined Willow.* Three-stamined: leaves ovate, oblique, serrate, smooth; germina pedicelled; stipules very large. This species never rises into a tree.—Native of several parts of Europe, in Osier holts and marshes.

10. Salix Hastata; *Halbert-leaved Willow.* Leaves serrate, smooth, subovate, acute, sessile; stipules subcordate. This grows to a tree, but never becomes tall.—Native of Lapland, Westrobothnia, Germany, Switzerland, Russia, and Siberia.

11. Salix Egyptiaca; *Egyptian Willow.* Leaves subserrate, lanceolate-ovate, veined; petioles simple, without stipules.—Native of Egypt and Barbary.

12. Salix Fragilis; *Crack Willow.* Leaves serrate, smooth, ovate-lanceolate; petioles tooth-glandular. This is one of the largest trees of the genus, known by the crooked position of its branches, which break off easily at the shoot of the preceding year. Villars observes, that though the branches are brittle on the tree, yet they are pliant when it is young, or kept down for Osiers; and that the male flowers have sometimes three stamina. It is a fast-growing tree, and soon forms a shade in wet places; the males are fittest for this purpose. Bees are fond of the male flowers. The bark of the branches has a considerable degree of bitterness and astringency, on which account it has been thought a good substitute for the Peruvian Bark, and has, with the second, third, and forty-fifth species, been recommended in cases requiring tonic or astringent medicines.

13. Salix Babylonica; *Weeping Willow.* Leaves serrate, smooth, linear-lanceolate; branches pendulous. This tree grows to a considerable size, and is esteemed for its long slender pendulous branches, which give it a peculiar character, and render it a beautiful object on the margin of streams or pools. The famous and admired Weeping Willow, planted by Pope, on the lawn bordering on the Thames, in front of his beautiful villa at Twickenham, was barbarously cut down a few years ago. It came from Spain, enclosing a present to the then Lady Suffield. Mr. Pope was in her ladyship's company when the covering was taken off, and observed, that the pieces of stick appeared as if they had some vegetation, and added, perhaps they may produce something we have not in England. Under this idea, he planted it, and it became the famous Willow Tree, from which, in honour of the Poet, a great number of slips have been taken, thereby producing so many others.—Native of the Levant, and found by Pursh in North America.

14. Salix Purpurea; *Bitter Purple Willow.* One-stamined: leaves obovate-lanceolate, serrate, smooth; stigmas very short, ovate, subsessile. This species is particularly distinguished by the length, as well as delicate slenderness of its twigs, and its subglaucous spurge-like leaves, but especially by their extreme bitterness when chewed. The antheræ, before they open, are of a bright orange-colour. The extreme bitterness of the leaves and twigs, renders it very valuable for many purposes. When used as a band or withe, it is never eaten by vermin; nor when formed into a hedge, is it browsed on by cattle, and even insects seldom attack it so much as the other species. In some parts of Yorkshire its twigs are used for making the finest sorts of basket work, for which purpose Mr. Curtis thinks it might be advantageously cultivated, since having planted cuttings of all the common Willows, one year, by way of experiment, he found that this species yielded the longest one-year's shoot, exceeding even that of the Osier. Linneus says, the twigs are the toughest of all the species. In bands for thatching, he says, it lasts above a century in Scania: he recommends it as the best sort for basket-work, and most excellent for hedges. The leaves turn of a blueish black colour in drying. The bark, from its extreme bitterness, may probably prove the most efficacious of any in agues. See the first species.

15. Salix Helix; *Rose Willow.* One-stamined: leaves lanceolate-acuminate, serrulate, smooth; style elongated, filiform; stigmas linear. This rises to the height of nine or ten feet, and is a small slender tree. The rose-like excrescences (caused by the attack of insects) are more common at the ends of the branches in this species; whence its name of Rose Willow. It flowers in March and April, and is a native of several parts of Europe. Haller says, it is planted about Aigle, to keep up gravelly banks and the shores of rivers.

16. Salix Fissa; *Basket Osier.* Monadelphous: leaves lanceolate-acute, somewhat toothletted, smooth, glaucous underneath. This is a shrub four or five feet high. It is cultivated in the fens of Great Britain, and preferred to all other Willows or Osiers for basket-work.—Native of various parts of Europe, on the sandy banks of rivers, flowering in April, and ripening seed in May.

17. Salix Rubra; *Green Osier.* Monadelphous: leaves linear-lanceolate, elongated, acute, toothletted, smooth, of the same colour on both sides. The branches of this shrub are very long, slender, tough, smooth, gray or purplish. It

appears to be very little known, though among the most valuable plants as an Osier.—It flowers in April and May, and is a native of England and France. It occurs in the Osier holts between Maidenhead and Windsor; in the river near Salisbury; in an Osier holt near Ely; also at Prickwillow near Ely; and in the neighbourhood of Bedford.

18. Salix Croweana; *Broad-leaved Monadelphous Willow.* Monadelphous: leaves elliptic, subserrate, very smooth, glaucous underneath. Discovered by Mr. Crowe; and is very distinct from all the other species, and easily known by its united stamina and short broad leaves. It is of no use as an Osier, as the twigs are short and brittle.—Found at Cranberry-fen in Norfolk, flowering in April and May.

19. Salix Arbuscula. Leaves subserrate, smooth, subdiaphanous, glaucous underneath; stem suffruticose.—This is scarcely a foot high, growing in the form of a little tree: when cultivated, it reaches the height of a man.

20. Salix Retusa; *Blunt-leaved Willow.* Leaves subserrate, smooth, obovate, very blunt. This is a very small plant, only a foot hign. The branches are not unfrequently all on one side of the stem.—Native of Dauphiny, Switzerland, and Italy.

21. Salix Decipiens. Leaves serrate, smooth, lanceolate, petioled, the lower ones smaller, obovate, reflex. Hoffman has named this Decipiens, because it resembles another species so much, that an incurious observer might easily be deceived in taking them for the same. The branches are brittle, snapping off at the joints. It flowers in May; and is a native of Europe, growing on the banks of rivers. It has also been found by Pursh in North America.

22. Salix Arbutifolia; *Arbutus-leaved Willow.* Leaves obovate, acute, serrate, smooth.—This low shrub is found in the eastern parts of Siberia, and in Switzerland and Savoy.

23. Salix Divaricata; *Straddling-branched Willow.* Leaves ovate, lanceolate, wave-serrate, smooth; branches divaricate.—Found on the mountains of Dauria.

24. Salix Rhamnifolia; *Buckthorn-leaved Willow.* Leaves ovate, obtuse, serrate, smooth, glaucous underneath.—This small shrub is a native of Russia, in watery places throughout the temperate and southern parts of the limits of Caucasus.

25. Salix Berberifolia; *Barberry-leaved Willow.* Leaves sessile, ovate, tooth-serrate, veined, shining.—This shrub is a native of the high mountains of many parts of Europe; and the northern counties of Great Britain, flowering in May.

** *Leaves smooth, quite entire.*

26. Salix Myrtilloides; *Myrtle-leaved Willow.* Leaves entire, smooth, ovate, acute. This is a small shrub, scarcely a foot high.—Native of Sweden and Iceland, Switzerland, the south of France, Ingria, and Siberia. It flowers in May.

27. Salix Integra. Leaves entire, smooth, linear-oblong, obtuse.—Native of Japan.

28. Salix Glauca; *Glaucous-leaved Willow.* Leaves quite entire, very finely villose underneath, ovate-oblong. This is a shrub, from two to three feet in height. According to Villars, it is a creeping and very singular shrub, with a large twisted trunk, of a greenish ash colour; branches short; bark greenish or blackish on the younger ones, and a little villose at the end.—Native of the mountains of Lapland, the Alps, and Pyrenees.

29. Salix Caspica; *Caspian Willow.* Leaves linear-lanceolate, quite entire, smooth. This shrub, which seldom exceeds six feet high, almost emulates the Weeping Willow in the slenderness of its twigs.—Native of Russia, in the sands between the southern Volga and the Rhymnus towards the Caspian Sea, and very abundantly by the rivers of Sarpa and Cuma.

*** *Leaves quite entire, villose.*

30. Salix Aurita; *Round-eared Willow.* Leaves quite entire, villose on both sides, obovate, appendicled. This small tree grows from a yard to eight feet high. It sometimes flowers a second time in the autumn, after having previously flowered in May. The shoots are slender, and tolerably flexible.—It has been observed near Bungay in Suffolk, and is common in the woods and hedges of Scotland.

31. Salix Lanata; *Woolly-leaved Willow.* Leaves woolly on both sides, roundish, acute.—Native of Lapland.

32. Salix Lapponum; *Lapland Willow.* Leaves quite entire, hirsute, lanceolate.—Native of Lapland, abounding in all the valleys of the high mountains.

33. Salix Arenaria; *Sand Willow.* Leaves entire, ovate, acute, subvillose above, tomentose underneath; stems about the height of a man, upright, little branched, cinereous, or red.—Native of many parts of Europe; found on the seashores of Scotland, among blowing sand.

34. Salix Incubacea; *Trailing Willow.* Leaves quite entire, lanceolate underneath, villose, shining; stipules ovate, acute.—Native of Sweden.

35. Salix Fusca; *Brown Dwarf Willow.* Leaves quite entire, ovate, pubescent underneath. This is a low, procumbent, creeping shrub. This species, and Arenaria Incubacea, and Repens, are closely allied.—Native of several parts of Europe. Found in England by Lansdown Castle between Southampton and Winchester; between Kilnsay and Arncliff in Yorkshire, and various parts of Scotland.

36. Salix Gmelini; *Gmelin's Willow.* Leaves elliptic-lanceolate, entire, silky underneath.—Native of Dauria.

37. Salix Serotina; *Late Willow.* Leaves oblong-acute, quite entire, silky; stipules lanceolate, deciduous. This shrub grows only six feet high in the water, but in a drier situation it becomes a tree, with a trunk the size of the human arm.—Native of Russia, in the sandy shallows and islands of the southern Volga, between Zarizin and Astracan; where it does not unfold its buds and put forth its catkins till the beginning of June, when the waters of the river begin to subside.

38. Salix Arctica; *Arctic Willow.* Leaves quite entire, obovate-rounded, villose underneath.—Found in the Arctic Circle on the shores of the Icy Sea.

**** *Leaves subserrate, villose.*

39. Salix Sibirica; *Siberian Willow.* Leaves ovate-lanceolate, subserrate, tomentose, stiffish; stipules ovate, somewhat toothed.—Native of the farther Siberia, by the subalpine streams of the Jenisca, and the plains of Dauria.

40. Salix Capræa; *Round-leaved Sallow.* Leaves ovate, wrinkled, tomentose underneath, waved, toothletted above; stipules somewhat crescent-shaped. This sometimes becomes a large tree; with spreading, brown or purplish, minutely downy branches. Linneus says, no species of Salix requires such a dry soil as this does. The bark is used in dyeing leather by the Laplanders; and the best gloves are prepared with it in Scania. The wood is soft, light, and flexible, fit for several uses of the turner, the handles of tools, knife-boards, &c. The coal is esteemed good for making gunpowder, and is used in drawing. It is of considerable service to bees, both by its early flowering and abundance of antheræ.—*Culture, &c.* The Sallows are commonly planted in cuttings made from strong shoots of the former year, about three feet long; these are commonly thrust down two feet deep into the ground, and remain one foot above the surface. The cuttings should be placed about five feet row from row, and two feet asunder in rows, observing always to plant the rows the sloping way of the ground, especially if the tides

overflow the place, because if placed the contrary way, all the filth and weeds will be detained by the sets, which will choke them up. The best season for planting is February; not sooner, because hard frosts may occur, and cause them to peel, which greatly injures them. These plants are always cut every year, and the yearly produce of an acre has frequently been sold for fifteen pounds, but ten pounds is a common price, and is more than corn-land will bring: hence it is a pity these plants are not more cultivated upon those moist boggy soils where nothing else will thrive.

41. Salix Acuminata; *Long-leaved Sallow*. Leaves ovate, oblong, tomentose underneath, the upper ones entire, the lower crenate. This species rises about six feet high, often resembling a small tree. It flowers in March and April, and the capsules ripen in May.—It is common about Oxford; and Dr. Withering noticed it at Kirkstall Abbey in Yorkshire. See the preceding species.

42. Salix Pedicellata; *Stalk-capsuled Sallow*. Leaves lanceolate, wrinkled, tomentose underneath; capsules pedicelled, smooth.—Found in Barbary.

43. Salix Viminalis; *Common Osier*. Not stipuled: leaves lanceolate-linear, very long, almost quite entire, flat, silky underneath; branches straight and slender. Ray says, this is the true Osier, at least that which is so called in Essex and Cambridgeshire. Varieties of it, and different species, are doubtless cultivated under this name. Innumerable varieties are grown in the Osier grounds for the basket-makers, and the same variety under different names in different places; so that it would be difficult, and of little use, to enumerate them. The Dutch and Wire Osiers are much esteemed about London. Evelyn enumerates many varieties of Osier known among basket-makers in his time. We have have in England, says he, three vulgar sorts: one of little worth, being brittle, and very much resembling the Sallow, with reddish twigs and more greenish and rounder leaves. A second, called *Perch*, of limber and green twigs, having a very slender leaf. The third totally like the second, only the twigs not altogether so green, but yellowish. This is the very best for use, tough, and hardy. The most usual names by which basket-makers call them about London, are, the *Hard Gelster*, the *Horse Gelster*, *Whyning* or *Shrivelled Gelster*, and *Black Gelster*, in which Suffolk abounds. Then follow the *Goldstones*, the hard and soft, brittle and worst of all the *Goldstones;* the sharp and slender-topped yellow *Goldstone*, and the fine *Goldstone*. Then there is the *Yellow Osier*, the *Green Osier*, the *Snake* or *Speckled Osier*, the *Swallow Tail*, and the *Spaniard*. To these we may add the *Flanders Willow*, which will arrive to be a large tree: with these coopers tie their hoops to keep them bent. Lastly, the *White Swallow*, used for green work; and if of the toughest sort, to make quarter can-hoops, of which our seamen provide great quantities.—*Cultivation*, &c. In order to raise a bed of Osiers, the ground being properly dug over or ploughed, cuttings must be procured of two-years' wood, though the bottom part of the strongest one-year's shoots may do; they should be two feet and a half long, a foot and half to be thrust into the ground, and the other foot to remain for the stool: put them in at two feet distance every way. The first summer the weeds must be kept under; and the next, the tallest must be hacked down. In three years the sets should all be cut down to the first planted heads. They will sell well to the hurdle-maker; and there will be a regular quantity of proper stools for an annual crop of twigs, which will be worth five or six pounds more an acre for the basket-maker. If Osier holts are overflowed by the tide, the rows should go the same way as the stream, and should be at a greater distance from each other, that the weeds, &c. may have free course; in this case the cuttings may be planted closer in the rows. Plantations designed to be cut every six or seven years for poles, may be raised in the same manner, only that the cuttings must be a yard asunder: but when intended for hurdles, the distance need not be so great. In Osier holts they commonly mix with the true Osier, the Sallow, the Long-shooting Green Willow, the Crane Willow, the Golden Willow, the Silver Willow, and the Welsh Wicker, for the different purposes of the basket-maker. For timber, the cuttings planted should be of the last year's shoot, a foot and a half long, a foot of which should be thrust into the ground: they should be planted at the distance of three feet every way. At the end of May or the beginning of June, the sets that have shot so luxuriantly should have all the branches removed, except the leading shoot.—In low moist situations Osiers may be cultivated, at least on a small scale, with great advantage to every farm: and the first step is, to throw soil into beds, so as to lay the surface sufficiently dry, the Osier disliking an unsound situation. This should be performed in autumn, and in the March following, these beds being firmly established, and their surfaces in good working order, the soil should be thoroughly trenched with the spade, and truncheons inserted. The method of planting an Osier ground is this: the soil being laid perfectly dry, and its surface made clean, cuttings of the second or third year's growth, and about twelve inches long, are planted in drills, about two feet and a half asunder, in the month of March. The cuttings ought to be thrust in seven or eight inches deep, leaving four or five inches of head above ground. The intervals should be kept stirred with a small plough; or the first year a crop of potatoes may be taken: the drills in either case must be kept perfectly clean with the hand-hoe; and at the approach of winter, the intervals should be split, and the mould thrown to the roots of the young plants, to lay them dry and warm during winter. The following spring the first year's shoots may be trimmed off, and the plants which have failed must be replaced. The second summer the intervals must be kept stirred, the drills hoed, and the plants earthed up as before against winter. The ensuing spring the stools may again be cleared, although the twigs as yet will be of little value. But at the third cutting they will produce marketable ware, and will increase in quantity and value, until the profits arising from them will be very great. In situations which the plant affects, and in countries where the twigs are in demand, Osier grounds have been known to pay an annual rent of ten pounds an acre; and ordinarily, if they be well managed, they will pay four or five.

44. Salix Cinerea; *Cinereous* or *Gray Sallow*. Leaves subserrate, oblong-ovate, subvillose underneath; stipules half cordate; branches tough, cylindrical, smooth, reddish. In woods it grows more than six, and sometimes nearly twelve, feet high; in exposed boggy ground it spreads more, but does not rise so high. The inhabitants of the Highlands and Hebrides frequently use the bark to tan leather. The wood is smooth, soft, white, and flexible. It is often used to make handles for hatchets, prongs, spades, &c. and furnishes shoemakers with cutting-boards, and whetting-boards to smooth the edges of their knives upon. About Palm Sunday the children in many parts of our island gather the flowering-branches, calling them Palms. It flowers in April, and is a native of Europe, in moist woods and hedges, not in a dry soil. See the fortieth species, for its cultivation, &c.

45. Salix Alba; *White Willow*. Leaves lanceolate, acuminate, serrate, pubescent on both sides, the lowest serra-

tures glandular. This, when suffered to grow without culture, becomes a large and lofty tree. It is of quick growth, and, when lopped, soon decays. The trunk is straight, with a gray rough bark, full of cracks; branches numerous, upright, but diffused, gray, or brownish green, the upper ones often dusky red; leaves silvery and gray, with close-pressed silky hairs, chiefly on the under side. The wood is white, light, and tough. Hanbury says, it is agreeable to burn, because it does not smoke, and gives a regular heat; though it is not generally esteemed as firing. It is used to make poles, stakes, hoops, &c. Cattle will feed on the leaves. In the summer season the leaves have been observed to distil a clear liquor, which Scopoli asserts to be owing to the liquefaction of the spume of the insect Cicada Spumaria, vulgarly called *Cuckoo Spittle*. The bark will tan leather, and dye yarn of a cinnamon colour: and the inner bark has often afforded a miserable substitute for bread to the necessitous inhabitants of Kamtschatka.—Native of low wet commons, and about the banks of rivers, in most parts of Europe, blossoming in May. Mr. Stone, in the *Philosophical Transactions*, gives an account of the great efficacy of the bark of this tree in curing intermittent fevers. He gathered the bark in summer when full of sap, dried it by a gentle heat, and gave a drachm of it powdered every four hours between the fits. In a few obstinate cases he mixed it with one fifth of Peruvian bark. It is remarkable that intermittents are most prevalent in wet countries, and that this tree grows naturally in such situations. While the Peruvian bark remained at its usual moderate price, it was hardly worth while to seek for a substitute; but since the consumption of that article is become nearly equal to the supply of it from South America, we must expect to find it dearer and more adulterated every year, and consequently the White Willow bark is likely to become an object worthy the attention of the faculty; and should its success, upon a more enlarged scale of practice, prove equal to Mr. Stone's experiments, the world will be much indebted to that gentleman for his communication. And as the bark of other species has the same properties, it ought to be determined by experience which species should be preferred.

46. Salix Tetrasperma; *Four-seeded Willow*. Leaves broad-lanceolate, acuminate, serrulate, smooth above, whitish below.—This is the only species of Willow yet found in India. It is a middle-sized tree, growing on the banks of rivulets, and in moist places far among the mountains. It flowers in the cold season.

The Indigenous North American *species of Salix, arranged according to Frederick Pursh, Author of "Flora Americæ Septentrionalis."*

* *Leaves very entire, or obsolete-serrate; vernation revolute.*

1. Salix Candida. Leaves linear-lanceolate, very long, obsolete-denticulate at the apex, pubescent on the upper side, nivose-tomentose beneath, revolute at the margin; stipules lanceolate; aments præcocious, cylindrical; squames obovate-lanceolate.—Grows in dry shady woods, from New York to Pennsylvania.

2. Salix Muhlenbergiana. Leaves lanceolate, somewhat acute, almost entire, pubescent-hoary, rugose-venous underneath, revolute at the margin; stipules deciduous, lanceolate; aments præcocious, diandrous; squames oblong, villose at the margin; germina ovate-lanceolate, sericeous-villose, pedicellate; style short; stigmata bifid; tree from three to five feet in height; branches greenish-yellow, with black dots; the antheræ are purple, changing to yellow when burst; scales white with a red tip, which gives the catkins a very pleasing appearance.—Grows in shady dry woods, from New York to Virginia.

3. Salix Tristis. Leaves linear-lanceolate, acute on both sides, very entire, revolute at the margin, somewhat glabrous on the upper side, rugose-venous underneath, tomentose; stipules none; aments præcocious, oblong.—Grows in dry sandy woods from New Jersey to Carolina.

4. Salix Recurvata. Leaves obovate-lanceolate, acute, very entire, glandulous at the margin, glabrous, glaucous underneath; younger leaves sericeous; stipules none; aments præcocious, recurved; squames black at the tip; hairs of the length of the germen; germina ovate, short-pedicellate, sericeous; style very short; stigmata bifid; branches brown, smooth; buds yellow.—Grows in shady woods, in the mountains of New Jersey and Pennsylvania.

** *Leaves very entire, or obsolete-serrate; vernation equitant.*

† *Stem creeping, depressed, or diffuse.*

5. Salix Repens. Leaves elliptic-lanceolate, very entire, acute, glabrous, subsericeous underneath; stipules none; aments præcocious, ovate, diandrous; squames obovate, obtuse, hairy, brown at the tip; germina ovate-oblong, pedicellate, pubescent; style very short; stigmata bilobed; capsules glabrous.—Grows in Nova Scotia and Newfoundland. A very small creeping species, which with numerous varieties is found in almost all the moist sandy heaths of Europe, flowering in May, and ripening fruit in June and July.

6. Salix Reticulata. Leaves elliptic-orbiculate, obtuse, very entire, glabrous, reticulate-venous, glaucous underneath; stipules none; aments pedunculed, diandrous; squames obovate, obtuse, pubescent; germina ovate, sessile, villose; stigmata subsessile, bipartite.—Grows in Labrador, Newfoundland, and on the north-west coast. This is a very low creeping species, with leaves very handsomely marked with coloured veins.

7. Salix Vestita. Leaves suborbiculate, very entire, glabrous on the upper surface, reticulate-venous; aments linear, sericeous; germina ovate, sessile, villose; style deeply bipartite; stigmata bifid.—Grows in Labrador.

8. Salix Uva Ursi. Leaves spathulate-obovate, obtuse, glabrous; aments lax; squames oblong, ciliate; germina ovate, pedicellate, glabrous; stigmata bilobed.—Grows in Labrador.

9. Salix Cordifolia. Leaves oval, subacute, cordated at the base, reticulate-venous; stipules semicordated.—Grows in Labrador.

10. Salix Obovata. Leaves obovate, obtuse, glabrous above, sericeous-villous beneath; aments subcoætaneous, sessile, oblong, diandrous; squames obovate, black at the tip, hairy.—Grows in Labrador, and on the North-west coast.

11. Salix Planifolia. Branchlets levigate; leaves oblong-lanceolate, acute on both sides, very glabrous, patent, plane, discoloured.—This singular species distinguishes itself at first sight by its remarkable plain and patent leaves: it is inclined to rise from the ground on a single low stem, and approaches to the following division.

†† *Stem erect.*

12. Salix Pedicellaris. Branchlets levigate; leaves obovate-lanceolate, acute, glabrous; aments coætaneous, pedunculed, very glabrous; squames oblong, as short again as the pedicel; stigmata sessile, bifid.—Grows on the Catskill mountains, New York.

13. Salix Lambertiana. Leaves subopposite, obovate-lanceolate, acute, glabrous, subserrate at the tip, discoloured; squames orbiculate, black; stigmata ovate, emarginate.—Grows on the banks of rivers, and in Willow-grounds, introduced from Europe.

14. Salix Rosmarinifolia. Leaves linear-lanceolate, acute,

subglandulose at the margin, deciduous-pubescent on the upper surface, sericeous underneath; stipules few, lanceolate, erect.—Grows in wet meadows and mountain swamps, from Pennsylvania to Carolina.

15. Salix Fuscata. Leaves obovate-lanceolate, acute, glabrous, subserrate, glaucous; the younger leaves pubescent; stipules few; stigmata sessile, bilobed.—Grows in low overflowed grounds, on the banks of rivers, from New York to Pennsylvania.

**** Leaves remotely and obtusely serrate.*

16. Salix Conifera. Leaves oblong-lanceolate, acute; style bifid; stigmata bilobed.—Grows in shady woods on gravelly dry soil, from New York to Carolina.

17. Salix Myricoides. Leaves oblong-lanceolate, acute, biglandulose at the base, glabrous, glaucous underneath; branches green; younger ones purple, smooth.—Grows in wet meadows and woods, from New England to Virginia.

18. Salix Prinoides. Leaves oval-oblong, acute, remotely undulate-serrate; stipules semicordated, inciso-dentated; style long.—Grows on the banks of rivers, from Pennsylvania to Virginia.

19. Salix Discolor. Leaves oblong, somewhat obtuse, glabrous; stipules deciduous, lanceolate-serrate; germina subsessile, lanceolate, tomentose; branches dark brown; filamenta white; antheræ red, yellow when burst.—Grows in low grounds and on the banks of rivers, from New England to Carolina.—This is the most common species in use in America for basket-making.

20. Salix Angustata. Leaves lanceolate, acute, very long; stipules semicordate; stigmata two-lobed.—Grows in shady woods on the banks of rivers, in New York and Pennsylvania.

21. Salix Longifolia. Leaves linear, acuminate on both sides, elongate; stipules few, lanceolate, denticulate; branches brown; branchlets white.—Grows on the banks of the Susquehannah.

***** Leaves thickly and acutely serrate.*

† Triandrous, (filamenta from three to six.)

22. Salix Houstoniana. Leaves linear-lanceolate, acute, very finely serrate, glabrous on both sides, shining; filamenta from three to five; branches extremely brittle at their base.—Grows in Virginia and Carolina.

23. Salix Falcata. Leaves very long, linear-lanceolate; younger leaves sericeous; stipules lunated, dentated, deflex; branches very slender and brown.—Grows on the banks of rivers, from Pennsylvania to Virginia.

24. Salix Nigra. Leaves lanceolate, acute, serrulate, glabrous; stipules small, dentated; germina pedicellate, ovate, glabrous; style very short; stigmata bifid; branches smooth, very brittle at the base.—This tree rises to the height of twenty feet; and grows on the banks of rivers, in Pennsylvania and Virginia.

25. Salix Lucida. Leaves ovate-oblong, cuspidate-acuminate, rounded at the base, serrate, glandulose, glabrous on both sides, shining; stipules oblong, glandulose-serrate; stigmata obtuse; branches yellowish-brown.—Grows in low grounds, about springs, from New York to Virginia.

26. Salix Rigida. Leaves oblong-lanceolate, acuminate, subcordated at the base, rigid, glabrous; aments subtriandrous; branches green, red towards the end; younger ones pubescent.—Grows in swamps and hedges, from New England to Virginia.

27. Salix Cordata. Leaves oblong-lanceolate, acuminate, cordated at the base, serrate, glabrous; stipules ovate-subrotund, cartilaginous-serrate.—Grows in low and swampy grounds, on the banks of rivers, from New York to Virginia.

†† Diandrous.

28. Salix Grisea. Leaves lanceolate, acuminate, serrulate, glabrous on the upper surface; stipules linear, deflex, deciduous; squames oblong, hairy, black at the tip; germina oblong, pedicellate, sericeous; branches greenish-purple, very brittle at the base.—Grows in low overflowed grounds, from Pennsylvania to Virginia.

29. Salix Petiolaris. Leaves lanceolate, serrate, glabrous; stipules lunated, dentated; squames obovate, obtuse, black, hairy; branches slender, smooth, dark brown.—Grows in swamps, and on the banks of rivers. A common North American species.

30. Salix Ambigua. Leaves lanceolate, acuminate, glabrous, glandulose-serrate; floscules terminal, triandrous.—Grows in the low grounds of New York and New Jersey.

31. Salix Myrsinites. Leaves elliptic-ovate, serrulate, glabrous, shining; stipules lanceolate, serrate; germina ovate-lanceolate, sessile, sericeous; stigmata subsessile, bifid; branches purplish-yellow.—A small straggling bush, not above a foot high, growing in Labrador.

32. Salix Herbacea. Leaves orbiculate, subretuse, serrate, glabrous on both sides, shining; stipules none; aments serotine, with few flowers; squames obovate, obtuse, villose; germina oblong-ovate, subsessile, glabrous; stigma very short, subsessile. This is the smallest of all the known species, the stems being not above an inch in height.—A native of the north-west coast of America.

Sallow. See *Salix.*

Salmasia; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments oblong, acute, permanent. *Corolla:* petals five, oblong, clawed, inserted into the receptacle, the length of the calix. *Stamina:* filamenta five, capillary, the length of the corolla, inserted into the receptacle; antheræ roundish. *Pistil:* germen three-cornered, superior; style none; stigmas three. *Pericarp:* capsule three-cornered, three-celled, three-valved; partitions contrary to the valves. *Seeds:* very many, minute. Essential Character. *Calix:* five-parted. *Corolla:* five-petalled. *Style:* none. *Capsules:* three-celled, three-valved, many-seeded.——The only known species is,

1. Salmasia Racemosa. This is a shrub, with round, hirsute, rufescent branches; leaves alternate, nearly sessile, oblong, pointed, entire, smooth; flowers white, in long, axillary, and terminating racemes.—Native of Guiana in woods, where it flowers and bears fruit in October.

Salsola; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth five-parted; segments ovate, concave, permanent. *Corolla:* none, unless the calix be so called. *Stamina:* filamenta five, very short, inserted into the segments of the calix. *Pistil:* germen globular; style three-parted, or two-parted, short; stigmas recurved. *Pericarp:* capsule ovate, wrapped in the calix, one-celled. *Seed:* single, very large, spiral. *Observe.* Some species have three styles. Essential Character. *Calix:* deeply five-cleft. *Corolla:* none. *Capsule:* one-seeded. *Seed:* screw-shaped.—All the annual sorts may be propagated by seed. In those countries where the preparation of soda forms a considerable branch of commerce, the seeds are regularly sown in a proper situation near the sea; where they usually shoot above ground in the course of a fortnight. In Spain they plough the land four or five times, dung it well, and then, having turned the earth twice more, they make it smooth with boards instead of harrows, and sow the seed in January and February, waiting always for wet weather. When the plant is about the bigness of a shilling,

they clear of all the weeds. About the time that the seeds become ripe, the plants are pulled up by the roots, and exposed in a suitable place to dry, and there the seeds are collected: this being done, the plants are tied up in bundles, and burned in an oven constructed for that purpose; the ashes, whilst hot, being continually stirred with long poles. The saline matter, on becoming cold, forms a hard solid mass, which is afterwards broken in pieces of a convenient size for exportation. The shrubby sorts may be propagated by layers or cuttings, which should be laid down in the spring, and when well rooted, in the autumn be taken off, and planted where they are to remain, in a warm sheltered situation.——The species are,

1. Salsola Kali; *Prickly Saltwort.* Herbaceous, decumbent: leaves awl-shaped, spiny, rugged; calices margined, axillary; root annual, fibrous. This plant, on being burned, yields fossil alkali: it contributes more generally to the manufacture of soda for making glass than Chenopodium Maritimum, but is not esteemed equal to some other species of Salsola.—It flowers with us in July; and is a native of the sandy shores of Europe, Asia, Africa, and America.

2. Salsola Tragus. Herbaceous, erect: leaves awl-shaped, spiny, even; calices ovate. This plant yields an ordinary kind of soda, with which the French in Languedoc adulterate the better sort. This fraud is also practised by the Sicilians, who call the plant *Selvaggia.*—Native of the sea-coasts of the south of Europe, and of Africa.

3. Salsola Rosacea; *Rose-coloured Saltwort.* Herbaceous: leaves awl-shaped, mucronate; calices spread out. The flowers are small, and of a rose-colour, soon fading.—Native of Tartary.

4. Salsola Soda; *French Saltwort.* Herbaceous, patulous: leaves unarmed; stems procumbent or upright, with spreading branches.—Native of the south of Europe.

5. Salsola Sativa; *Spanish Saltwort*, or *Barilla.* Diffused, herbaceous: leaves round, smooth; flowers conglomerate. This plant grows abundantly on that part of the Spanish coast which is washed by the Mediterranean Sea, and affords all the best soda consumed in Europe, and called by us Spanish or Alicant Soda, and by the Spanish merchants Barilla de Alicante. Various other marine plants yield soda, but they are principally of this genus, or of Salicornia, both deriving their names from this quality. It is to be regretted that the different sorts of soda which are brought to European markets, have not been sufficiently analyzed to enable us to ascertain with tolerable certainty the respective value of each; indeed, whilst the practice of adulterating this salt continues, all attempts at analyzation are likely to prove fruitless. According to those analyses which have been attempted, soda generally contains a portion of vegetable alkali and neutral salts; as common salt, and sometimes vitriolated tartar or Glauber's Salt, likewise liver of sulphur; and not unfrequently some portion of iron is contained in the mass: it is therefore to be considered as more or less a compound, and its goodness should be estimated accordingly. The Spanish soda of the best sort is in dark-coloured masses of a blueish tinge, very ponderous, sonorous, dry to the touch, externally abounding with small cavities, without any offensive smell, and very salt to the taste: if longer exposed to the air, it undergoes a degree of spontaneous calcination. The best French soda is also dry, sonorous, and brittle, and of a deep blue colour approaching to black. The soda which is mixed with small stones, gives out a fetid smell on solution, and is white, soft, and deliquescent, and is of the worst sort. The method of purifying this salt for medicine may be found in the London and Edinburgh Pharmacopœias, in the former under the article *Natron Præparatum;* and in the Edinburgh, under that of *Sal Alkalinus fixus fossilis purificatus.* The pure crystals thus formed from Alicant Barilla, are colourless, transparent, lamellated, rhomboidal; and one hundred parts are found to contain twenty of alkali, sixteen of aërial acid, and sixty-four of water; but upon keeping the crystals for a length of time, if the air be admitted, the water evaporates, and they assume the form of a white powder. This salt preserves flesh longer than common salt, but not so long as the vegetable alkali. Natron has been thought useful in scrofulous disorders, but is seldom given in its simple state. In combination with vitriolic acid, this alkali forms Glauber's Salt or Natron Vitriolatum; with nitrous acid, Cubic Nitre; with marine acid, common Salt; with the sedative salt of Homberg, Borax; and with cream of tartar, Rochelle Salt, or Sel Saignette. Soda or Barilla is in common use in the manufactures of glass and soap. White Spanish soap, being made of the finer kinds of Olive oil, is preferred for internal use.

6. Salsola Spicata; *Spiked Saltwort.* Herbaceous: leaves oblong, obtuse, semicylindric; flowers in threes, axillary, subspiked.—Native of Spain.

7. Salsola Altissima; *Grass-leaved Saltwort.* Herbaceous, erect, very much branched: leaves filiform, sharpish, pedunculiferous at the base.—Found in Italy, in Saxony, and in Astracan.

8. Salsola Trigyna; *Trifid-styled Saltwort.* Herbaceous, erect: leaves filiform, obtuse, fleshy; flowers axillary, sessile, in threes; styles trifid.—Native of Spain.

9. Salsola Salsa; *Striped-stalked Saltwort.* Herbaceous, nearly upright: leaves linear, somewhat fleshy, awnless; calices succulent, diaphanous. Stems a foot high, panicled, even, purplish, somewhat striated.—Native of Astracan.

10. Salsola Nudiflora; *Naked-flowered Saltwort.* Somewhat woody, ascending; leaves filiform, fleshy; flowers glomerate; leaves the length of the glomerules. Perennial.—Native of the East Indies, on the coast of Tranquebar.

11. Salsola Flavescens; *Yellow Saltwort.* Somewhat woody, erect; leaves round, pubescent; flowers subglomerate. Perennial.—Native of Spain.

12. Salsola Hirsuta; *Hairy Saltwort.* Herbaceous, diffused: leaves round, obtuse, tomentose. Annual.—Native of France and Denmark, on the sea-coast.

13. Salsola Laniflora; *Woolly-flowered Saltwort.* Herbaceous: leaves round, pubescent; flowers axillary; antheræ coloured. Flowers three together, yellow.—Native of Siberia.

14. Salsola Hyssopifolia; *Hyssop-leaved Saltwort.* Herbaceous: leaves linear, flat; glomerules of flowers axillary, woolly.—Native of the dry salt plains of Siberia.

15. Salsola Polyclonos; *Many-spiked Saltwort.* Somewhat woody, diffused; leaves oblong; calices margined, glomerate, coloured.—Native of the shores of Spain and Sicily.

16. Salsola Prostrata; *Prostrate Saltwort.* Frutescent: leaves linear, hairy-unarmed. Flowers axillary, small, flesh-coloured.—Native of Spain, Austria, Switzerland, and Siberia.

17. Salsola Monandra; *Fleshy-leaved Saltwort.* Stem herbaceous, branched, fleshy, almost leafless; radical leaves round, fleshy; flowers one-stamined.—Native of Siberia, by the lake Altan, and in the steppes of Astracan.

18. Salsola Vermiculata; *Narrow-leaved Saltwort.* Frutescent: leaves in bundles, round, filiform; floral leaves ovate, acute, fleshy. Stems shrubby, two to four feet high, sending out many side-branches; leaves alternate, very small; flowers small, in numerous, dense, terminal spikes.—Native of Spain.

19. Salsola Arbuscula; *Bushy Saltwort.* Shrubby: leaves in bundles, round, attenuated at the base, incurved; flowers solitary, scattered.—Native of Tartary.

20. Salsola Aphylla; *Leafless Saltwort.* Arborescent, jointed: leaves very short, ovate, pressed close, acute, soon falling off. A very irregular shrub, five or six feet high, the branches covered with the rudiments of the flowers.—Native of the Cape.

21. Salsola Arborescens; *Tree Saltwort.* Frutescent: leaves semicylindric, the lower conjugate.—Native of Siberia.

22. Salsola Fruticosa; *Shrubby Saltwort.* Shrubby: leaves fleshy, round, obtuse, imbricate. The leaves have an herbaceous flavour, with a slight degree of salt, and some acrimony. It forms an elegant evergreen shrub, with a woody, erect, round, much branched stem, flowering in July and August; not unworthy of a place in gardens.—This plant is found on the coasts of Norfolk, Suffolk, and Dorsetshire; and of France, Spain, Barbary, and Persia.

23. Salsola Indica; *Indian Saltwort.* Shrubby: leaves linear, fleshy, half round; floral leaves oblong, obtuse.—Native of the East Indies.

24. Salsola Sedioides; *Sedum-like Saltwort.* Suffruticose: leaves round, filiform, ciliate; flowers glomerate, axillary.—Native of Siberia.

25. Salsola Muricata; *Hairy Saltwort.* Shrubby, patulous: branchlets hirsute; calices spiny. Annual: flowering in July and August.—Native of Egypt and Barbary.

26. Salsola Didyma; *Twin-fruited Saltwort.* Stem herbaceous, decumbent; leaves oblong, unarmed; capsules two-lobed, two-seeded.—Native of Mozambique.

27. Salsola Echinus; *Thorny Saltwort.* Shrubby, smooth: leaves subulate, awnless; spines divaricate, flowering.—Native of the highest parts of Mount Libanus.

28. Salsola Camphorosmoides; *Camphorosma-leaved Saltwort.* Shrubby, smooth: leaves filiform, in axillary bundles.—Native of Barbary, in fallow fields.

29. Salsola Brevifolia; *Short-leaved Saltwort.* Shrubby, very much branched: leaves ovate, clustered, very short, pubescent.—Native of Sicily and Barbary.

30. Salsola Mollis; *Soft-leaved Saltwort.* Shrubby: branches spreading; leaves round, fleshy, glaucous, obtuse.—Native of Sicily and Barbary.

31. Salsola Oppositifolia; *Opposite-leaved Saltwort.* Shrubby: leaves sublate, unarmed, opposite. This is a very handsome species, and quite distinct from all its congeners.—Native of Tunis in Africa, and of Spain and Sicily.

32. Salsola Caroliniana. Plant herbaceous, decumbent, glabrous; leaves dilatate-subulate, spinescent; buds fruitful, very turgid; calices fructiferous, explanato-alated.—Grows in Carolina.

33. Salsola Depressa. Plant herbaceous, very branchy; branchlets distich; leaves succulent, linear, acute, glabrous; flowers axillary, sessile; stamina standing out. This plant was discovered by Mr. Thomas Nuttall, on the volcanic plains of the Missouri.

34. Salsola Australis. Herbaceous, smooth, very much branched: leaves awl-shaped, spinous, divaricated; bractes longer than the calix, which is solitary.—Native of Port Jackson, and the southern parts of New Holland.

35. Salsola Macrophylla. Rather shrubby, erect, smooth, glaucous; leaves awl-shaped, spinous, divaricated, triangular at the base; bractes divaricated.—Native of the tropical parts of New Holland.

Saltwort. See *Glaux, Salicornia,* and *Salsola.*

Salvadora; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four-cleft; segments obtuse. *Corolla:* one-petalled; tube short; border four-cleft; lobes oblong, revolute. *Stamina:* filamenta four, the length of the calix, reflex; antheræ round. *Pistil:* germen roundish; style single, short, or none; stigma simple, blunt, umbilicate. *Pericarp:* berry globular, one-celled. *Seed:* single, spherical, covered with a callous aril. Essential Character. *Calix:* four-cleft. *Corolla:* four-cleft. *Berry:* one-seeded. *Seed:* covered with an aril.——The species are,

1. Salvadora Persica. Leaves oval or oblong; flowers panicled. This is a middle-sized tree, native of most part of the Circars, though by no means common: also of Tranquebar, and the Persian gulf. It seems to grow equally well in every soil; and flowers and bears fruit all the year round. The berries have a strong aromatic smell, and taste much like Garden Cresses. The bark of the root is remarkably acrid; bruised, and applied to the skin, it soon raises blisters, for which purpose the natives often use it: as a stimulus, it promises to be a medicine possessed of considerable powers.

2. Salvadora Capitulata. Leaves ovate, acuminate: heads axillary. This is a middle-sized tree, very much branched.—Native of Cochin-china.

3. Salvadora Biflora. Leaves lanceolate-ovate; flowers in pairs. Ten feet high, with many twisted spreading branches.—Native of the woods of Cochin-china; where this and the second species are not easily distinguished except in flower.

Salvia; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, striated, gradually widening and compressed at the top; mouth erect, two-lipped; lower lip two-toothed. *Corolla:* one-petalled, unequal; tube widening at the top, compressed; border ringent; upper lip concave, compressed, curved inwards, emarginate; lower lip wide, trifid; middle segment largest, roundish, emarginate. *Stamina:* filamenta two, very short; two threads are fastened transversely to these almost in the middle, on the lower extremity of which is a gland, on the upper an anther. *Pistil:* germen four-cleft; style filiform, very long, in the same situation with the stamina; stigma bifid. *Pericarp:* none, the calix very slightly converging, having the seeds in the bottom of it. *Seeds:* four, roundish. *Observe.* The singular forking of the filamenta constitutes the essential character. There are rudiments of two stamina, but barren ones in the opening of the corolla; glands in most species callous, but in a few a sort of rudiment of an anther, with little or no pollen, occurs. Essential Character. *Calix:* somewhat bell-shaped, two-lipped. *Corolla:* ringent. *Filamenta:* fastened transversely to a pedicel. *Seeds:* four, naked.——The species are,

1. Salvia Ægyptiaca; *Egyptian Sage.* Leaves lanceolate, toothletted; flowers peduncled. Plant a foot high, stiff and brachiate. It flowers in June and July.—Native of Egypt and the Canary Islands.——*Culture, &c.* All the species of this genus may be propagated by seeds; but as some of them do not produce seeds in England, and most of the sorts, but especially the common kinds for use, are easily raised from slips, it is not worth while to raise them from seeds. The slips of the hardy sorts should be planted in the beginning of April, on a shady border, where, if they are now and then refreshed with water, if the season should prove dry, they will soon take root. When these slips have made good roots, they may be taken up with balls of earth, and transplanted where they are to remain, which should always be upon a dry soil, and where they may have the benefit of the sun; for if they are planted on a moist soil, or in a shady situation, they are very subject to be destroyed in winter; nor will these plants endure the cold so well, when planted upon a rich soil, as those in barren dry rocky ground: and this is the case with most verticillate plants, which will often grow upon walls exposed to the cold of severe winters, when the

plants in the ground are destroyed. The side-shoots and tops of these plants may be gathered in the summer and dried, if intended for tea: for most other purposes they are better when gathered green. Several of the species are so tender, that they cannot endure the open air in our winter: such must be planted in pots filled with fresh light sandy earth, and placed under a hot-bed frame, that they may have a great share of fresh air whenever the season is mild; for when too much drawn, they seldom flower well, and make but an insignificant appearance. In summer they must be exposed among other plants, in some well-sheltered situation, and should be often refreshed with water in warm weather. They should be new-potted at least twice every summer. The annual plants can only be propagated by seeds, sown in a bed of light earth, where they are to remain.

2. Salvia Dentata; *Tooth-leaved Sage.* Leaves linear-oblong; tooth-pinnatifid; whorls two-flowered; calicine segments blunt.—Native of the Cape.——*Culture, &c. of the tender sorts.* This, and the species referred to this, being natives of a warmer country, require protection in winter. They are easily propagated by cuttings in the spring and summer months. If they are planted early in the spring, it will be the best way to plant them in pots, which should be plunged into a very moderate hot-bed; and if they are shaded from the sun in the heat of the day, and gently refreshed with water as they may require it, they will have put out good roots in about two months, when they should be inured gradually to the open air, into which they must be removed soon after. The cuttings which are raised early in the season, will become strong plants before winter, and will be in a better condition to resist the cold than those which are weak. If the cuttings be planted in summer, they will require no artificial heat; so that if planted on a bed of fresh loamy earth, and covered close down with a bell or hand glass, and shaded from the sun in the heat of the day, giving them now and then a little water, they will take root freely, and when they begin to shoot, they should have free air admitted to them, by raising the glass on one side, and so gradually exposing them to the open air. When the plants are well rooted, they should be each transplanted into a separate small pot, filled with fresh light earth, and placed in a shady situation till they have taken new root; then they may be removed to a sheltered situation, where they may remain till the approach of frost, when they must be carried into shelter, and in winter treated in the same manner as other hardy green-house plants, which only require protection from frost; observing not to overwater them during the cold weather, but in the summer water will be required often in the open air.

3. Salvia Cretica; *Cretan Sage.* Leaves linear-lanceolate; flowers two-styled; calices two-leaved. It is shrubby, and flowers from June to August.—Native of Candia.

4. Salvia Lyrata; *Lyre-leaved Sage.* Root-leaves lyrate, toothed; helmet of the corolla very short.—Native of Virginia and Carolina. See the second species.

5. Salvia Leucantha. Leaves linear-lanceolate, crenulate, wrinkled; flowers whorl-spiked; calices tomentose.—Native of Mexico. See the second species.

6. Salvia Habligiana. Leaves linear, quite entire, pubescent, sessile; flowers whorl-spiked; bractes ovate, acuminate.—Native of Mount Tauris.

7. Salvia Officinalis; *Garden Sage.* Leaves lanceolate-ovate, crenulate; whorls few-flowered; calices mucronate. This is a branching shrub, about two feet in height.—Native of rough stony ground in the south of Europe and Barbary, flowering in our gardens in June and July. There are numerous varieties of this species; as the Common Green Sage, the Wormwood Sage, the Green Sage with a variegated leaf; the Red Sage with a variegated leaf, the Painted or Party-coloured Sage, with red leaves, striped with white; and the Spanish or Lavender-leaved Sage. But that with red or blackish leaves is the most common in the English gardens: and the Wormwood Sage is more abundant than the Common Green-leaved Sage. This plant has a strong fragrant smell, and a warm bitterish aromatic taste. In ancient times it was much celebrated as a remedy of great efficacy, but few practitioners at present consider it of much importance; and though frequently employed as a sudorific, it seems to have no superiority over many other plants. Some are said to have employed it successfully for the purpose of restraining inordinate sweating. Van Swieten found it to be remarkably efficacious in arresting night-sweats, when infused in wine or spirit; but Quarin remarks, that a strong infusion in water has been experienced to be equally successful. Van Swieten also found it useful in restraining the improper continuance of a flow of milk from the breasts of women, after they had weaned their children. It is highly serviceable as a tonic, in a debility of the stomach and nervous system; and for this purpose the Chinese highly value it, and give it the preference to their own Tea. The Italians eat it as a preservative of health; and many of our people follow their example, eating it with bread and butter, than which there is no better way of taking it. The expressed juice, taken in small doses, increases the urinary discharge, and promotes the menstrual one when suppressed. The power of this plant in resisting the putrefaction of animal substances, has also been adduced in proof of its medicinal efficacy. From the experiments of Etlinger, it has a considerable share of antiseptic power. Although this plant appears in the catalogue of the materia medica of the London College, it is not directed to be used in any of the preparations. It still keeps its ground in fomentations, among the common people; and in the kitchen, for sauce to luscious and strong meats.—The roots will last several years, if they are planted in a warm dry soil; but where they are often cropped for use, the plants will often become ragged, so there should be a succession of young ones raised every other year.

8. Salvia Grandiflora; *Broad-leaved Garden Sage.* Leaves cordate, oblong, crenate; whorls many-flowered; calices acute; stalks shorter than those of the preceding species. This is generally called Balsamic Sage, and is preferred to all the others for making tea. Cultivated like the preceding.

9. Salvia Triloba; *Three-lobed Sage.* Tomentose: leaves ovate, finely crenate, rugose, woolly beneath, auricled at the base; calix with five acute teeth. The flowers are smaller and of a deeper blue than those of the Common Sage.—Native of Crete and Syria.

10. Salvia Pomifera; *Apple-bearing Sage.* Leaves cordate, elliptic, blunt, tomentose, crenulate, waved at the edge; whorls in clusters; calices trifid, blunt. The branches are punctured by insects, which produce protuberances as big as small apples, in the same manner as galls upon the Oak, &c. These are carried to market under the name of Sage Apples, and are much esteemed when candied with sugar. This plant smells like a mixture of Sage and Lavender.—Found by Tournefort in Candia.

11. Salvia Urticifolia; *Nettle-leaved Sage.* Leaves ovate-oblong, doubly-serrate; calices three-toothed; upper segment three-toothed; stem high, upright, and smooth.—Native of Virginia and Florida.

12. Salvia Occidentalis; *West Indian Sage.* Leaves ovate, serrate; spikes loose; bractes cordate, subtriflorous. In

Jamaica, this little plant is found creeping under every hedge and bush in the lower lands: it runs frequently to the length of two or three feet, but always roots at the lower joints. It has a faint smell of Balm when first pulled.—Native of the West Indies. See the second species.

13. Salvia Tiliæfolia; *Lime-leaved Sage.* Leaves cordate, wrinkled, equally crenate, serrate, acute; calices smoothish, awned. Stem herbaceous, upright, stiff, somewhat villose, with the angles blunt.—Native of Mexico.

14. Salvia Serotina; *Late-flowering Sage.* Leaves cordate, serrate, soft; flowers raceme-spiked; corollas scarcely exceeding the calix; root biennial. The odour unpleasant and strong.—Supposed to be a native of the isle of Chios.

15. Salvia Tenella. Leaves cordate; stem filiform, creeping; spikes ascending. This is an herbaceous annual plant, with long capillary creeping roots.—Native of Jamaica, in the gravelly and grassy parts of the highest mountains.

16. Salvia Viridis; *Green-topped Sage.* Leaves oblong, crenate; helmet of the corolla semiorbicular; fruiting calices reflex. A small, annual, slightly branched herb, with scarcely any aromatic flavour.—Native of Italy, and of Africa on the hills about Tunis. Sow the seeds of this and the next species in the spring, where they are designed to remain: keep them clean from weeds, and thin them where they are close.

17. Salvia Horminum; *Red-topped Sage.* Leaves obtuse, crenate; upper bractes barren, larger, coloured. The stems have whorls of small flowers, and are terminated by clusters of small leaves, forming two varieties, one with purple and another with red tops. For the sake of this coma, they are preserved in gardens for ornament. They flower in June and July, and ripen their seeds in autumn. An infusion of the leaves is a good gargle for putrid spongy gums; and the powder of them, snuffed up the nose, excites sneezing, and a dischage of watery humours from the head; the leaves or seed put into the vat with ale while fermenting, greatly increase its inebriating quality.—Native of the south of Europe. Annual.

18. Salvia Virgata; *Long-branched Sage.* Leaves oblong, cordate, wrinkled, crenate; hairs of the stem and calix glandular at the tip. It flowers from July to November.—Native of the Pyrenean mountains.

19. Salvia Sylvestris; *Spotted-stalked Bohemian Sage.* Leaves cordate, wrinkled, biserrate; bractes coloured, shorter than the flower, acuminate; hairs of the stem and calix simple.—Native of Austria, Silesia, and the hills about Turin.

20. Salvia Nemorosa; *Spear-leaved Sage.* Leaves cordate, lanceolate, serrate, flat; bractes coloured; lower lip of the corolla reflex. It flowers from June to October.—Native of Austria and Tartary.

21. Salvia Syriaca; *Syrian Sage.* Leaves cordate, toothed; the lower repand; bractes cordate, short, acute: calices tomentose; stem hairy. This species lasts two or three years, and has a sweet smell.—Found in Syria and Palestine.

22. Salvia Viscosa; *Clammy Sage.* Leaves oblong, blunt, erose-crenate, viscid; flowers in whorls; bractes cordate, acute. Perennial. It flowers in June.—Native of Italy.

23. Salvia Hœmatodes; *Bloody Sage.* Leaves cordate-ovate, wrinkled, tomentose; calices hispid; root tuberous.—Native of Italy and Istria.

24. Salvia Pratensis; *Meadow Sage,* or *Clary.* Leaves cordate-oblong; crenate, the upper ones embracing; whorls almost naked; corollas having a glutinous helmet. Root perennial. Dr. Withering remarks, that the floral leaves are about the length of the calix, which is spread open; that the corolla, of a blueish purple, is four times as large as the calix, with the helmet hooked like the handle of a walking-stick; and that its gumminess not being constant, ought not to make a part of its specific character.—It flowers in July, and is a native of many parts of Europe, in dry pastures and by hedge sides. It is one of the most showy, as well as the most rare plants of British growth. It has been noticed near Cobham in Kent; at Wicksclifts in Gloucestershire; between Middleton-Stoney, and Audley, in Oxfordshire; near Ford-End Farm, Bedford; and often in Sussex and Surry.

25. Salvia Bicolor; *Two-coloured Sage.* Leaves ovate, erose-toothed; flowers nodding; the middle segment of the lower lip of the corolla concave.—This handsome plant is a native of Barbary; found in corn-fields, flowering in spring.

26. Salvia Indica; *Indian Sage.* Leaves cordate, sublobed at the sides, the upper ones sessile; whorls almost naked, very remote. This magnificent plant is rarely seen in our gardens, which is perhaps owing to its not being considered as a hardy plant. The flower, which is beautiful, appears from May to July.—It may be increased by seeds, as it is hardy enough to live in the open air in England, and the root will abide several years in a dry soil. As however the seeds are but sparingly produced here, it may also be increased by parting the roots in the autumn or spring. Some shelter must be afforded to this plant in severe winters. It flowers in great perfection in a large garden-pot, but it will succeed as well or better in the open border, but should be defended from cold winds.

27. Salvia Dominica; *Dominica Sage.* Leaves cordate, obtuse, crenate, subtomentose; corollas narrower than the calix.—Common in the fields and coppices of the West Indies. See the second species.

28. Salvia Verbenaca; *Vervain Sage,* or *Clary.* Leaves serrate, sinuate, smoothish; corollas narrower than the calix. Root perennial, brown, the thickness of the middle finger, striking deep into the erth. This is smaller than the twenty-fourth species, but more aromatic, and of a deeper green. The herb and flower sprove very aromatic when rubbed. The seeds are smooth, and produce a great quantity of soft tasteless mucilage when moistened, whence they become serviceable for removing extraneous matter from the eyes. If put under the eyelids for a few moments, the tears dissolve their mucilage, which envelopes any sand or dust that may be in the way, and brings it out safely. Hence some old writers have called it Oculus Christi; and others, of our own country, have ridiculously enough derived our English name Clary from the same circumstance. It flowers through the whole summer, from June to October.—Native of all parts of Europe, and not uncommon in England. This species propagates itself in plenty, if the seeds are permitted to scatter, and only requires to be kept clean from weeds.

29. Salvia Scabra; *Rugged Sage.* Rugged: leaves lyrate, toothed, wrinkled; stem panicle-branched. It is shrubby, and flowers in England during most part of the summer.—Native of the Cape. See the second species.

30. Salvia Runcinata; *Runcinate-leaved Sage.* Rugged: leaves runcinate-pinnatifid, toothed; flowers spiked, whorled.—Native of the Cape.

31. Salvia Clandestina; *Cut-leaved Sage.* Leaves serrate, pinnatifid, very much wrinkled: spike obtuse; corollas narrower than the calix. Biennial: flowering from May to July.—Native of Italy, of Cyprus, and of Barbary.

32. Salvia Austriaca; *Austrian Sage.* Leaves ovate and cordate, erose-sinuate; root-leaves petioled; stem almost leafless; stamina double the length of the corolla; flowers white, or very pale yellow, and of moderate size, appearing in June and July.—Native of Austria, Hungary, and Maldavia.

33. Salvia Pyrenaica; *Pyrenean Sage.* Leaves obtuse, erose; stamina double the length of the corolla.—Native of the Pyrenees.

34. Salvia Disermas; *Long-spiked Sage.* Leaves cordate-oblong, erose; stamina equal to the corolla. It flowers in July.—Native of Syria.

35. Salvia Rugosa; *Wrinkled-leaved Sage.* Leaves cordate, oblong-lanceolate, erose, crenate, wrinkled, somewhat hairy; stamina shorter than the corolla. It flowers in July and August.—Native of the Cape. See the second species.

36. Salvia Nubia; *Nubian Sage.* Leaves oblong, subcordate, unequilateral, wrinkled, crenate, sometimes eared at the base. It flowers in June and July.—Native of Africa.

37. Salvia Nilotica; *Nile Sage.* Leaves sinuate, angular, crenate-toothed; teeth of the calices spiny; angles and margin of the aperture ciliate.—Native of Egypt.

38. Salvia Mexicana; *Mexican Sage.* Leaves ovate, acuminate at both ends, serrate.—Native of Mexico. This makes a pretty variety in the green-house, by flowering in the winter season. It must have a dry situation in winter, for the young shoots are very apt to grow mouldy in a damp air. Neither this nor the fifty-second species produces seeds in England; they are propagated by cuttings, in the same way as directed under the second species.

39. Salvia Amethystina; *Amethystine Sage.* Leaves cordate, acute, serrate, woolly beneath; whorls naked; calices trifid; corollas pubescent. A slightly shrubby species, conspicuous for its handsome large flowers, of a rich violet hue, with a velvety upper lip. There is no smell nor aromatic taste in the dry plant, but the leaves are almost as bitter as the roots of Gentian.—Native of New Granada.

40. Salvia Fulgens; *Fulgid Sage.* Leaves cordate, acute, crenate, wrinkled, tomentose beneath; whorls naked; calices trifid; helmet of the corollas villose. It flowers from October to February.—Native of Mexico.

41. Salvia Formosa; *Shining-leaved Sage.* Leaves subcordate; helmet of the corollas bearded; calices three-lobed; stem frutescent. The flowers in this species are not in a terminating raceme, spike, or panicle, as in the others, but in separate whorls from the axils of the leaves, without any proper bractes; the corolla large, of a rich and brilliant scarlet.—Native of Peru. This excellent species is now very generally cultivated near London as a green-house plant. It is easily propagated by cuttings. In the winter it requires to be placed in a warm dry green-house, and to be sparingly watered, as it is rather tender.

42. Salvia Tubiflora; *Long-tubed Sage.* Leaves cordate, crenate, somewhat hairy; calices trifid; corollas very long, tubular; stamina standing out. The dried leaves are scarcely aromatic, and not very bitter.—It is a native of Lima in South America.

43. Salvia Longiflora; *Long-flowered Sage.* Leaves ovate, acute, serrate, pubescent; calices trifid; corollas very long, tubular, pubescent; stamina the length of the corolla, which are of a scarlet colour.—Native of Mexico.

44. Salvia Coccinea; *Scarlet-flowered Sage.* Leaves cordate, acute, tomentose, serrate; corollas narrower than the calix, and twice as long. The corollas are of a very beautiful scarlet.—Native of East Florida.

45. Salvia Pseudococcinea. Leaves ovate, acute, serrate, unequal at the base; stem hairy; corollas double the length of the calix. This resembles the preceding.—Native of South America.

46. Salvia Hispanica; *Spanish Sage.* Leaves ovate; petioles mucronate each way; spikes imbricate; calices trifid. It flowers in June and July.—Native of Spain and Italy.

47. Salvia Abyssinica; *Abyssinian Sage.* Lower leaves lyrate; upper cordate; flowers in whorls; calices mucronate, ciliate.—Native of Africa.

48. Salvia Verticillata; *Whorl-flowered Sage.* Leaves cordate, crenate, toothed; whorls almost naked; style of the corolla incumbent on the lower lip.—Native of Germany and Austria. There is a variety which flowers from June to November, and is a native of the south of France and Italy.—Sow the seeds in the spring on an open spot of ground; keep the plants clean from weeds, and let them not be nearer than two feet, for they grow very large, and will last several years.

49. Salvia Napifolia; *Rape-leaved Sage.* Leaves cordate, crenate, toothed; lower ones hastate and lyrate; whorls almost naked; upper lip shorter.—Native of the warmest parts of the globe.

50. Salvia Glutinosa; *Yellow Sage*, or *Clary.* Leaves cordate, sagittate, serrate, acute. This has an abiding root, composed of strong woody fibres. The whole plant is very clammy, and has a powerful scent somewhat like common Garden Clary. The flowers are used in Holland to give a flavour to the Rhenish wines.—Native of Germany, Austria, Switzerland, Italy, and the south of France. It may be propagated not only by seeds, but by parting the roots in autumn, and will continue several years.

51. Salvia Barrelieri. Leaves unequally toothed, acuminate, cordate, angular, hastate at the base; whorls almost naked.—Native of Spain.

52. Salvia Canariensis; *Canary Sage.* Leaves hastate-triangular, oblong, crenate, obtuse. It flowers from June to September.—Native of the Canary Islands.

53. Salvia Aurita; *Eared Sage.* Villose: leaves ovate, toothed, eared; flowers whorl-spiked.—Native of the Cape.

54. Salvia Africana; *Blue-flowered African Sage.* heaves roundish, serrate, truncate and toothed at the base. The flowers come out in whorls towards the end of the branches; they are of a fine blue colour, larger than those of the Common Sage, appearing in succession during most of the summer months; and those which come early are often followed by seeds ripening in autumn.—Native of the Cape of Good Hope. See the second species, for its propagation and culture.

55. Salvia Aurea; *Gold-flowered African Sage.* Leaves roundish, quite entire, truncate and toothed at the base; flowers in thick short spikes at the ends of the branches. Stem shrubby, and bushy; corolla of a brownish-yellow, with a peculiar acid scent, resembling the flavour of tamarinds It flowers from May to November.—Native of the banks of rivulets at the Cape. See the second species.

56. Salvia Colorata; *Coloured-calix African Sage.* Leaves elliptic, almost quite entire, tomentose; border of the calix membranaceous, coloured.—Native of the Cape. See the second species.

57. Salvia Paniculata; *Panicled African Sage.* Leaves obovate, wedge-form, toothletted, naked; stem frutescent.—Native of the Cape. See the second species.

58. Salvia Acetabulosa. Leaves obovate, toothed; calices bell-shaped, spreading, hairy; stem shrubby.—Native of the Levant.

59. Salvia Spinosa; *Thorny-calixed Sage.* Leaves oblong, repand; calices spiny; bractes cordate, mucronate, concave.—Native of Egypt.

60. Salvia Tingitana; *Tangier Sage.* Leaves cordate, erose, toothed; calices spiny; bractes quite entire, cordate, mucronate, concave, ciliate.—Native of Northern Africa.

61. Salvia Sclarea; *Common Clary.* Leaves wrinkled, cor-

date, oblong, villose, serrate; floral bractes longer than the calix, concave, acuminate; flowers in loose terminating spikes. Stem two or three feet high; leaves as large as the hand, viscid and strongly scented; flowers and bractes variegated with pale purple and yellowish-white. The whole plant has a very strong scent. It was formerly used in medicine, but is now neglected. A wine is made from the herb in flower, boiled with sugar, which has a flavour not unlike Frontiniac. It is found in the West Indies, where this plant is still much in use as a remedy among the negroes, who consider it as cleansing, cooling, and consolidating to ulcers and sore legs, to which they are very subject. It is also used in inflammations of the eyes; and the leaves, boiled with Cocoa-nut oil, are said to cure the sting of scorpions. This, with the Vervain, (see *Verbena Jamaicensis*,) are two of the ingredients which form the aromatic warm bath, a remedy which deserves to be in more general use. The Garden Sage, a species of this genus, is there made into a decoction, sweetened and acidulated with lime-juice, and used as a cooling drink in fevers. The virtues of the Sage are stimulant, carminative, tonic, and aromatic. It is biennial, flowering from July to September, and a native of Syria, Italy, and Dauphiny. This plant is propagated by seeds, which should be sown in the spring, and when the plants are fit to remove, they should be either transplanted into beds, or, if a large quantity is required, they may be planted in an open spot of ground, in rows two feet asunder, and one foot distance in the rows. After the plants have taken root, they will require no further care but to keep them clean from weeds. The winter and spring following, the leaves, which are the only part used, will be in perfection, and in the summer they will run up to flower, and, after they have ripened their seeds, decay, so that there should be young plants annually raised for use. It will thrive upon almost any soil that is not wet; for this plant frequently rots upon moist grounds in the winter.

62. Salvia Involucrata. Leaves ovate-lanceolate, serrate; flowers in terminating spikes; bractes very large, coloured. A beautiful plant, owing to the number and size of the flowers, the spike of which is terminated by bractes, complicated into a pale rose-coloured strobile.—Native of Mexico.

63. Salvia Ceratophylla; *Horn-leaved Sage.* Leaves wrinkled, pinnatifid, woolly; upper whorls barren. Biennial.—Native of Persia, and found in Syria.

64. Salvia Ethiopis; *Woolly Sage*, or *Clary.* Leaves oblong, erose, woolly; whorls woolly; bractes recurved, somewhat spiny. There are two varieties of this species; one with very broad embracing leaves, the other with leaves nearly the shape of Betony. Biennial.—Native of Europe and Africa.

65. Salvia Phlomoides. Leaves lanceolate, almost entire; stem woolly and viscid.—Native of Spain, in the mountains about Siguenza

66. Salvia Argentea; *Silvery-leaved Sage.* Leaves oblong, tooth-angular, woolly; upper whorls barren; bractes concave. A large biennial hoary herb: stem panicle-formed, bearing many opposite whorled spikes of large white flowers, all turned one way, their palate yellowish. This, according to Mr. Miller, will live several years in a dry soil. It flowers in June, and ripens seed in the beginning of August.—Native of Crete. Sow the seeds in the beginning of April, in a dry or rubbishy soil, where the plants will live through the winter in the open air, and the second year will produce flowers and seeds.

67. Salvia Vulnerariæfolia; *Kidney-vetch-leaved Sage.* Leaves pinnate, quite entire; terminating leaflet very large. —Shrubby; native of the Levant.

68. Salvia Pinnata; *Wing-leaved Sage.* Hairy and viscid: Leaves pinnate; pinnas erose; calix inflated. It flowers in July.—Native of the Levant.

69. Salvia Incarnata; *Flesh-coloured Sage.* Leaves pinnate, serrate; stem procumbent, hirsute.—Native of the Levant.

70. Salvia Rosæfolia; *Rose-leaved Sage.* Leaves pinnate, hoary; leaflets serrate; calices ringent. Shrubby; with hairy branches, and simple pinnate leaves, consisting of two pair of stalked leaflets with an odd one; flowers several in each whorl, rather large.—Native of Armenia.

71. Salvia Japonica; *Japan Sage.* Leaves bipinnate, smooth. Annual.—Native of Japan.

72. Salvia Ceratophylloides; *Branchy Sage.* Leaves pinnatifid, wrinkled, villose; stem panicled, very much branched. Biennial; flowering from June to September.—Native of Sicily and Egypt.

73. Salvia Forskælei. Leaves lyrate, eared; stem almost leafless; helmet of the corolla semibifid. It resembles the next species.—Native of the Levant.

74. Salvia Nutans; *Nodding Sage.* Leaves cordate, indistinctly five-lobed, erose; stem roundish; racemes nodding. —Native of Russia.

75. Salvia Hastata; *Halbert-leaved Sage.* Leaves hastate-lanceolate, crenate; stem almost naked; racemes drooping. —Native of Russia.

76. Salvia Betonicæfolia; *Betony-leaved Sage.* Leaves lanceolate, crenate; stem almost naked; racemes drooping. —Native of Russia.

77. Salvia Algeriensis; *Algerine Sage.* Lower leaves ovate, crenate, decurrent into the petiole; calices tooth-spiny, nodding; bractes reflex; stem upright, hirsute, with blunt angles. —Native of Algiers.

78. Salvia Fœtida; *Fetid Sage.* Shrubby: leaves cordate-ovate, very much wrinkled, villose; flowers whorl-spiked; fruiting calices compressed. The whole plant has a very strong smell.—Native of the kingdom of Tunis.

79. Salvia Patula; *Spreading Sage.* Root-leaves cordate, woolly, sinuate, erose; stem and calices villose, glutinose; bractes concave, mucronate; upper flowers fading.—Native of Portugal, Syria, and Barbary.

80. Salvia Trichostemoides. Leaves lanceolate, serrate; flowers in terminal racemes, opposite; corolla nearly equal with the trifid calix; stem brachiate, very branchy; flowers small, sky-blue.—Grows on the open plains of the Missouri.

81. Salvia Azurea. Leaves linear-lanceolate; calix pubescent, very slightly trifid; flowers beautiful blue, sometimes white.—Grows in open sandy situations in Carolina and Georgia.

Salvinia; a genus of the class Cryptogamia, order Miscellaniæ.—Generic Character. *Male Flowers:* four to nine, among whorled roots, heaped into a little ball. *Calix:* subglobular, pubescent, one-celled, consisting of a double membrane; the inner thinner, ten or twelve ribs between them. *Corolla:* none, unless it be the inner membrane of the calix. *Stamina:* an upright pillar, placed on the base of the calix, the whole length of it, and putting out from two to three hundred capillary filamenta; antheræ globular, one-celled. *Female*, in the middle of the ball, solitary. *Calix* and *Corolla:* as in the males. *Pistil:* germina about fifteen, obliquely ovate, blunt, rugged with dots, each on distinct pedicels, fastened to the bottom of the calix; style none; stigma doubtful, perhaps a dot on the top of the germen. *Pericarp:* none. *Seeds:* as many in number as the germina, and of the same form. *Observe* The male and female flowers may be distinguished in the dry plant

before the calices open, by the size of the protuberant grains. For the species, see *Marsilea*.

Samara; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth very small, four-parted, acute, permanent. *Corolla:* petals four, ovate, sessile, with a longitudinal pit at the base. *Stamina:* filamenta four, awl-shaped, long, opposite to the petals, immersed in the pit; antheræ subcordate. *Pistil:* germen ovate, shorter by half than the corolla, superior, ending in a style that is cylindrical and longer; stigma funnel-form. *Pericarp:* drupe roundish. *Seed:* solitary. Essential Character. *Calix:* four-parted. *Petals:* four. *Stamina:* immersed in the base of the petal. *Stigma:* funnel-shaped. *Drupe:* one-seeded.——The species are,

1. Samara Læta. Flowers clustered, pedicelled; leaves ovate, obtuse; branches purplish, even; flowers small, yellowish.—This shrub is a native of the East Indies.

2. Samara Coriacea. Flowers sessile, conglomerate; leaves lanceolate-ovate, acute, subcoriaceous. This is a tree with a trunk from twenty to thirty feet in height, and upright branches.—Native of Jamaica, where it is found on the mountains and in the woods of the southern parts.

3. Samara Pentandra. Flowers pentandrous; leaves elliptic-ovate, bluntish. This is distinct from the first and second species, and agrees with the fourth in having five stamina to the flowers.—Native of the Cape.

4. Samara Floribunda. Flowers pentandrous; leaves obovate. This is a shrub, five feet high, branched at top; flowers copious, white, in lateral tufts. It flowers and fruits in December.—Native of Cayenne and Guiana.

Sambucus; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth one-leafed, superior, five-parted, very small, permanent. *Corolla:* one-petalled, rotate, concave, five-cleft, blunt; segments reflex. *Stamina:* filamenta five, awl-shaped, the length of the corolla; anthera roundish. *Pistil:* germen inferior, ovate, blunt; style none, but instead of it a ventricose gland; stigmas three, blunt. *Pericarp:* berry roundish, one-celled. *Seeds:* three, convex on one side, angular on the other. Essential Character. *Calix:* five-parted. *Corolla:* five-cleft. *Berry:* three-seeded.——The species are,

1. Sambucus Ebulus; *Dwarf Elder*. Cymes three-parted; stipules leafy; stem herbaceous; root perennial, creeping. This plant seldom exceeds three feet high; it was formerly called Wallwort or Walewort, and Danewort, from a notion of its having sprung from the blood of the Danes. It differs from the Common Elder, in being herbaceous, in having a creeping root, and narrower leaflets, more numerous, and sometimes lobed.—Found in waste places by the side of hedges, flowering in July. The whole plant has a faint disagreeable smell, stronger and more unpleasant, yet not unlike that of the Common Elder, in the other properties of which it also partakes; being generally a more violent medicine. One drachm and a half of the root is a strong purge. The rob made from the berries, though actively cathartic, may be used with tolerable safety, as far as an ounce in a dose; but it has the inconveniences of Senna, and is not at all preferable to that drug. It can only be used as a medicine by persons of a strong constitution, who are afflicted with dropsies or other watery humours. The leaves being bruised, and laid on burns and scalds, take away the pain, and speedily heal them. Boiled in lye, and applied by way of fomentation to any part affected with gouty pains, they frequently procure a remission therefrom. The juice of the root is said to turn any light-coloured hair black. No cattle will eat the leaves; the mole will not even come where the leaves, or those of the Common Elder, are laid; mice also forsake the granaries where these leaves are introduced, and they are in consequence used to remove those mischievous little animals; and are strewn by the Silesians in their hog-sties, under the persuasion that they prevent some of the diseases to which swine are liable.—This plant rapidly propagates itself wherever it is once planted, by its creeping roots, so that it is very difficult to keep within bounds.

2. Sambucus Canadensis; *Canadian Elder*. Cymes five-parted; leaves subbipinnate; stem frutescent. This is a middle species between the preceding and the following species. The berries are small, dark red, and sweet. It flowers from June to August, and is a native of North America.—This will put out roots from cuttings almost as easily as the common sort; but, being liable to injury from severe frosts, it should be planted in a sheltered situation.

3. Sambucus Nigra; *Common Elder*. Cymes five-parted; leaflets ovate, serrate; stem arboreous. This grows to a bushy tree, twelve or sixteen feet in height, much branched, and covered with a smooth gray bark when young, which becomes rough on the trunk and older branches. There are two British varieties of the common Elder; one with cut leaves; and hence called Parsley-leaved Elder: the berries of both are whiter and more pleasant flavoured than the original species.—The whole plant has a narcotic smell, and it is not prudent to sleep under its shade. The wood is commonly made into skewers for butchers, tops for angling rods, and needles for weaving nets. It is not bad wood to turn in the lathe; and the pith, which is exceedingly light, is cut into balls, and is used in electrical experiments. This tree is, as it were, a whole magazine of physic to rustic practitioners, nor is it quite neglected by more regular ones. An emollient ointment is made of the green inner bark; which bark is also a strong purgative, and may be employed to advantage where acrid stimulating purges are required. In smaller doses it is diuretic, and has done essential service in obstinate glandular obstructions, and in dropsies. Sydenham, who recommends it as an effectual hydragogue, directs three handfuls of it to be boiled in a quart of milk and water, till only a pint remains, of which one half is to be taken night and morning, and repeated several days. Boerhaave gave its expressed juice, in doses from a drachm to half an ounce. It usually operates both upwards and downwards. If sheep that have the rot can get at the bark and young shoots, they will cure themselves. The leaves are also purgative, but more nauseous than the bark; they are an ingredient in several cooling ointments. If turnips, cabbages, fruit-trees, or corn, be whipped with the green leaves and branches of Elder, or if a gate stuck with the branches be drawn over the crops, it is said that insects will not attack them. An infusion of the leaves is useful for curious gardeners to sprinkle over the buds of such flowers as they wish to preserve from minute caterpillars, for few insects can bear the Elder. A decoction of the flowers, taken internally, is said to promote expectoration in pleurisies: when fresh gathered, they are gently laxative and aperient; when dry, they are thought chiefly to promote the cuticular excretion, and to be particularly serviceable in erysipelatous and eruptive disorders; externally, they are used in fomentations, to ease pain and abate inflammation. In the London Pharmacopœia, they are directed in form of an ointment. Many persons use them to give a flavour to vinegar. The berries are boiled into a rob, which is really useful in sore throats and catarrhs, and acts as a gentle laxative in febrile disorders. The officinal preparation of these berries, is the *Succus Baccæ, Sambuci, Spissatus*, of the London Pharmacopœia.

The juice of the berries is used to give a red colour to raisin or sugar wines; and some country housewives make an excellent domestic wine of the berries. The flowers are reported to be fatal to turkeys, and the berries to poultry in general. Linneus observes, that sheep eat the leaves, but that horses and goats refuse it; others report that cows are fond of it.—This very useful tree, as well as the fifth species, may be easily propagated by cuttings, or by sowing their seeds; but the former being the most expeditious method, is generally practised. The season for planting their cuttings is any time from September to March, in doing of which there needs no more care than to thrust the cuttings about six or eight inches into the ground, and they will take root fast enough, and may be afterwards transplanted where they are to remain; they are extremely hardy, and if their seeds are permitted to fall upon the ground, they will produce abundance of plants in the following summer. These trees are often planted for making fences, because of their quick growth; but as their bottoms become naked in a few years, they are not properly adapted for that purpose; neither should they be planted near habitations, because in their flowering-season they emit such a strong scent, as will occasion violent pains in the heads of those who abide long near them; for the crude particles which are perspired through their leaves are very unwholesome, though the leaves, bark, and other parts, are greatly esteemed for many uses in medicine. This species will grow in any soil or situation; and is frequently seen in old walls close to ditches, and even upon hollow trees, for wherever the berries are scattered by birds, the seed will not fail to vegetate.

4. Sambucus Japonica. Cymes three-parted; stipules none; stem shrubby; flowers white.—Native of Japan.

5. Sambucus Racemosa; *Red-berried Elder.* Racemes compound, ovate; stem arboreous. This species sends up many shrubby stalks from the root, rising ten or twelve feet high, and dividing into many branches, which are covered with a brown bark; flowers of an herbaceous white colour, appearing in April, and sometimes succeeded by berries, which are red when ripe. The leaves are eaten by the red deer, and the berries by partridges, moor-game, &c.—Native of mountains in the south of Europe.

6. Sambucus Pubescens. Bark verrucose; leaflets dijugous, oval-lanceolate, pubescent underneath; cymes crowded together, racemose; berries red.—Grows on the highest mountains from Canada to Carolina. This plant has a close affinity to the preceding species.

Samolus; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, superior, blunt at the base; segments erect, permanent. *Corolla:* one-petalled, salver-shaped; tube very short, the length of the calix, patulous; border flat, five-parted, blunt; scalelets very short, at the base of the sinus of the border, converging. *Stamina:* filamenta five, short, fenced by the scalelets of the corolla; antheræ converging, covered. *Pistil:* germen inferior; style filiform, length of the stamina; stigma capitate. *Pericarp:* capsule ovate, girt by the calix, one-celled, half five-valved. *Seeds:* very numerous, ovate, (according to Gærtner, angular,) small; receptacle globular, large. Essential Character. *Corolla:* salver-shaped, five-cleft, with five intermediate scalelets. *Stamina:* fenced by the scalelets of the corolla. *Capsule:* one-celled, inferior. ——The species are,

1. Samolus Valerandi; *Brookweed,* or *Water Pimpernel.* Leaves all obovate or obtuse, perfectly entire, shining; having few veins, and those distant; clusters corymbose. A pale, smooth, rather succulent herb, about a foot high, with entire leaves, and copious, small, white flowers.—It is an inhabitant of most parts of the globe, in marshes, wet meadows, and in great ditches. It is not very common in England, but by no means so rare as to make it necessary to enumerate its places of growth. It flowers in July. There is an African variety with a firmer stem, more branched, and covered with minute white spots.—If the seeds of this plant be sown soon after they are ripe, on a moist spot of ground, they will come up readily, and only require to be kept clean from weeds.

2. Samolus Littoralis; *Shore Brookweed.* Stem round, branched, leafy; radical leaves spatulate; stem-leaves nearly lanceolate; segments of the calix nearly acute.—Native of most parts of New Holland.—Two other species, *Junceus* and *Ambigua,* have been found in the same country.

Sampire. See *Crithmum Maritimum.*

Sampire, Marsh. See *Salicornia.*

Samyda; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, coloured within; tube bell-shaped, ten-streaked; border five-cleft; segments ovate, flat, spreading very much, blunt, two of them augmented with a point. *Corolla:* none: nectary one-leafed, conical, truncate, eight to eighteen streaked, almost the length of the calix, and inserted into the border at its base; mouth blunt, furnished with as many teeth. *Stamina:* filamenta none; antheræ oblong, erect, small, as many as the teeth of the nectary, and placed on them. *Pistil:* germen ovate; style awl-shaped, erect, length of the nectary; stigma capitate, obtuse. *Pericarp:* capsule roundish, furrowed, coriaceous, thick, one-celled, four or five valved. *Seeds:* very many, subovate, obtuse, marked with a little pore at the base, fastened to the valves, wrapped in a pulpy pellicle. Essential Character. *Calix:* five-parted, coloured. *Corolla:* none. *Nectary:* bell-shaped, staminiferous. *Capsule:* berried within, four or five valved, one-celled. *Seeds:* nestling.——The species are,

1. Samyda Nitida. Flowers eight-stamined; leaves cordate, smooth. Browne calls it the Shrubby Samyda, or the Larger Clovenberry Bush.—It is frequent in Jamaica, commonly growing on the low lands. This, like the rest of the plants of this genus, may be propagated by seeds, procured from the countries where they naturally grow. Sow them upon a hot-bed in the spring; and when the plants come up, set them in small pots filled with good kitchen-garden earth, plunge them into a hot-bed of tanner's bark, and treat them in the same way as other tender plants from the same countries. Keep them in the bark-bed till they have acquired strength, and then they may be exposed in summer; but in winter they require a good green-house.

2. Samyda Macrophylla. Flowers eight-stamined; leaves ovate, acute, smooth; axils of the veins villose beneath; corymb terminating.—Native of the East Indies.

3. Samyda Multiflora. Flowers eight-stamined; leaves oblong, toothed, attenuated at both ends, tomentose beneath; peduncles one-flowered, aggregate, axillary; branches woody, round.—Native of the West Indies.

4. Samyda Villosa. Flowers ten-stamined; leaves oblong, subserrate, oblique at the base, villose beneath; peduncles solitary, axillary. A branched shrub, six feet high.—Native of the mountains of Jamaica, where it flowers in spring.

5. Samyda Glabrata. Flowers ten-stamined; leaves ovate-lanceolate, quite entire, shining; peduncles axillary, one-flowered.—Native of high mountains in the northern part of Jamaica, flowering in October and November.

6. Samyda Spinescens. Flowers ten-stamined, terminating; leaves lanceolate-ovate, obtuse, crenate, smooth; branches patulous, spinescent.—Native of Hispaniola, where it flowers in December and January.

7. Samyda Pubescens. Flowers twelve-stamined; leaves ovate, tomentose beneath.—Native of South America.

8. Samyda Serrulata. Flowers eighteen-stamined, solitary; leaves ovate-oblong, serrulate.—Native of the West Indies.

9. Samyda Rosea. Flowers twelve-stamined, aggregate; leaves oblong, very obtuse, serrated, downy on both sides. A shrub with drooping branches, which bear many axillary flowers. It blooms copiously in the stove during the summer months.—Native of the West Indies.

Sandal Wood. See *Santalum.*

Sanders, White and *Yellow.* See *Santalum.*

Sandoricum; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, five-toothed, short. *Corolla:* petals five, lanceolate, spreading. *Nectary:* a cylindrical tube, the length of the petals, with a ten-toothed mouth. *Stamina:* filamenta none; antheræ ten, oblong, within the mouth of the nectary. *Pistil:* germen globular, superior; style filiform, length of the nectary; stigma thickish, grooved, ten-rayed; the rays recurved. *Pericarp:* berry or drupe, roundish, depressed, five-lobed, succulent, one-celled. *Seeds:* five, large, convex on one side, angular on the other. Essential Character. *Calix:* five-toothed. *Petals:* five. *Nectary:* cylindrical, truncate, bearing the antheræ at its mouth. *Drupe:* filled with five seeds.——The only species yet discovered is,

1. Sandoricum Indicum. A large and lofty tree, whose wood is red at the heart. Leaves alternate, on long petioles, ternate; flowers white, in compound axillary clusters; fruit the size of a small orange, its pulp acid, and containing five large bitter seeds.—Native of the Philippine and Molucca islands.

Sandwort. See *Arenaria.*

Sanguinaria; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth two-leaved, ovate, concave, shorter than the corolla, deciduous. *Corolla:* petals eight, oblong, blunt, spreading very much, alternately interior, and narrower. *Stamina:* filamenta very many, simple, shorter than the corolla; antheræ simple. *Pistil:* germen oblong, compressed; style none; stigma thickish, two-grooved, the height of the stamina, permanent. *Pericarp:* capsule oblong, ventricose, sharp at both ends, two-valved. *Seeds:* very many, round, acuminate. Essential Character. *Calix:* two-leaved. *Corolla:* eight-petalled. *Silique:* ovate, one-celled.——The species are,

1. Sanguinaria Canadensis; *Canadian Bloodwort*, or *Puccoon.* Root perennial, tuberous, thick, fleshy. The radical leaf very tenderly embraces and cherishes the infant flower, in the same way as in Osmunda Lunaria. The root, leaves, and flowers, have no smell. Though this cannot be considered as a showy plant, yet it has few equals in point of delicacy and singularity: there is something to admire in it, from the time that its leaves emerge from the ground, and embosom the infant blossom, to their full expansion, and the ripening of their seed-vessels. It has a fulvous milk like Celandine, with which the Indians are said to paint themselves. —The woods of Canada, and other parts of North America, produce this plant in abundance: in England it flowers in the beginning of April, but its blossoms are fugacious, and fully expand only in fine warm weather. It is a very proper plant to mix with the Dog's-tooth Violet, Spring Cyclamen, Persian Iris, Bulbocodium, Sisyrinchium, and some other low-growing bulbous and tuberous rooted flowers, which require the same culture, while the Puccoon will add to the variety while they are in beauty. A soil, having a mixture of bog-earth or rotten leaves in it, suits this plant best. It is hardy enough to endure the open air in England, but it should be planted in a loose soil and a sheltered situation, not too much exposed to the sun. It is propagated by the roots, which may be taken up and parted every other year: the best time for doing of this is in September. When the roots are strong, and grow in a good soil, they will produce a great number of flowers upon each; the roots may be planted about four or five inches asunder every way. The flowers appear in April, and, when they decay, the green leaves come out, which will continue till Midsummer. The roots remain inactive till the following autumn; so that unless they are marked, it will be difficult to distinguish them after their leaves decay, for being of a dirty brown colour on the outside, they are not easily found in the earth.

2. Sanguinaria Stenopetala. This plant is considered by Pursh merely as a variety of the former. It has white flowers; the number of petals is variable. It is known by the name of Bloodwort.—Grows in dry woods, generally in fertile soils, from Canada to Florida. It is distinguished from the first species by its linear petals.

Sanguisorba; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth two-leaved; leaflets opposite, very short, caducous. *Corolla:* one-petalled, wheel-shaped; tube subglobular; border four-cleft, flat; segments subovate. *Stamina:* filamenta four, almost the length of the corolla; antheræ simple. *Pistil:* germen roundish, within the tube of the corolla; style filiform, length of the corolla, permanent; stigma simple. *Pericarp:* capsule globular, one-celled, cut transversely. *Seeds:* very many, roundish, very small. Essential Character. *Calix:* two-leaved, inferior. *Corolla:* superior. *Germen:* between the calix and corolla.——The species are,

1. Sanguisorba Officinalis; *Great Burnet.* Spikes ovate. Stem upright, almost naked, branching towards the top, two feet high; leaves on long stalks, unequally pinnated; flowers of a dark dull purple colour, in dense heads or spikes. It differs from the next species, in having ovate, not cylindrical, spikes, and smooth calices, not ciliate at the edge. The varieties called Italian and Spanish Burnet, are considered as distinct species by Mr. Miller. This plant is coarse, and not acceptable to cattle. Withering observes, that the whole of this plant is of a binding nature; the leaves are sometimes put into wine, to give it an agreeable flavour; and the young shoots are a good ingredient in salads. The plant is in fact a cordial and sudorific. The root dried and powdered stops purgings, and a strong decoction of it, or of the leaves, sometimes answers the same purpose.—Found in meadows in various parts of Europe; and not unfrequently in moist rich pastures in the north of Britain, flowering in June and July. —All the plants of this genus are very hardy perennials; they will thrive in almost any soil and situation; and may be propagated either by seeds or parting the roots: if by the former, they should be sown in the autumn, for if sown in the spring they seldom grow in the same year. When the plants come up, they should be kept clean from weeds till they are strong enough to transplant, when they may be planted in a shady border, at about six inches' distance each way, observing to water them till they have taken new root, after which they will require no other care but to keep them clean from weeds till autumn: they may then be transplanted to the place where they are to remain, and in the following summer will produce flowers and seeds, and their roots will last many years. If the roots are parted, it should be done in autumn, that they may get good hold of the ground before the dry weather returns.

2. Sanguisorba Media; *Short-spiked Burnet.* Spikes cylindrical. This has much the appearance of the first species,

but differs in having cylindrical spikes of reddish flowers, and longer stamens. It flowers from July to September.—Native of Canada.

3. Sanguisorba Canadensis; *Canadian Burnet.* Spikes very long. Stalks three feet high, divided at the top into numerous branches. There is a variety with long spikes of red flowers of a higher growth, with thicker spikes, and broader leaflets, white underneath. It flowers from June to September.—Native of North America and Siberia.

Sanicle. See *Sanicula.*

Sanicle, Yorkshire. See *Pinguicula.*

Sanicula; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal, with very few rays, (often four;) partial, with many clustered, subcapitate. *Involucre Universal:* halved, placed outwardly; partial surrounding, shorter than the floscules; perianth scarcely observable. *Corolla Universal:* uniform; floscules of the disk abortive; partial of five compressed inflexed petals, closing the flower. *Stamina:* filamenta five, simple, twice as long as the corollets, erect; antheræ roundish. *Pistil:* germen hispid, inferior; styles two, awl-shaped, reflexed; stigmas acute. *Pericarp:* none; fruit ovate, acute, rugged, bipartile. *Seeds:* two, convex and muricate on one side, flat on the other. Essential Character. *Umbels:* clustered, subcapitate. *Fruit:* rough with hooked bristles. *Central Flowers:* abortive.——The species are,

1. Sanicula Europæa; *Common* or *European Sanicle.* Root-leaves simple; florets all sessile. Root perennial, with long branched fleshy fibres; stem from twelve to eighteen inches high, upright, round, grooved, almost naked, a little branched, smooth; leaves stalked, smooth, deeply seven-lobed; flowers sessile, capitate, white or blush-coloured. It is very common in Great Britain, in a rich soil, flowering in May.—Some persons esteem a strong decoction of the leaves of this plant as good against the bleeding piles, and for checking immoderate menses, but it has long been discarded by medical practitioners. It discovers to the taste, says Lewis, some bitterishness and roughness, followed by an impression of acrimony which affects chiefly the throat; in the fresh leaves the taste is very weak, in the dry leaves considerable, as also in the extract made from them by water, or moderately strong spirit.—Part the roots any time from September to March; but the best time for this operation is in the autumn. In a moist soil and a shady situation they will thrive exceedingly.

2. Sanicula Canadensis; *Canadian Sanicle.* Root-leaves compound; leaflets ovate.—Native of Canada, Virginia, the Cape of Good Hope, and Japan.

3. Sanicula Marilandica; *Maryland Sanicle.* Male flowers peduncled; hermaphrodites sessile; root perennial. The whole plant is smooth. It flowers in June and July.—Native of Virginia and Maryland.

Santalum; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth superior, one-leafed, bell-shaped, four-toothed. *Corolla:* petals four, placed on the segments of the calix, straighter; glands four, smaller than the petals, alternate with them. *Stamina:* filamenta four, thread-shaped, growing on the tube of the calix; antheræ simple. *Pistil:* germen inferior, conical; style length of the stamina; stigma with three or four lobes. *Pericarp:* berry obovate. *Seed:* one. Essential Character. *Calix:* four-toothed. *Corolla:* four-petalled, with the petals growing on the calix, besides four glands. *Berry:* inferior, one-seeded.——The only known species is,

1. Santalum Album: *White and Yellow Sandal Wood.* Leaves opposite, on short petioles, spreading, lanceolate, entire, waved, smooth, shining, about two inches long, and three-quarters of an inch broad; flowers small, red, in a terminating, compound, erect thyrse-like, raceme; berry globular, size of a currant, smooth, juicy, black when ripe, greedily eaten by birds, who evacuate and thereby propagate it extensively. The wood of this tree is the White and Yellow Sanders, or Sandal Wood; *Santalum Album,* and *Flavum,* of the Materia Medica, both being the produce of the same tree. Most trees in India, when large and old, become coloured towards the centre; that part is always much more hard and durable than the exterior or uncoloured part. So it is with the Sandal-tree: the centre, when the tree becomes large, acquires a yellow colour, great fragrance and hardness; while the exterior part of the same tree, that covers the coloured part, is less firm, white, and without fragrance. It is only the yellow part that is of use, and the larger the tree the more valuable is the wood, it having then acquired a greater degree of fragrance, for which alone it is held in such universal estimation.—This valuable tree is a native of many parts of India. In the Circar mountains, where it grows wild, it is small, and the wood of little value. On the coast of Malabar, the largest and best sort is obtained. Five other species of Santalum have been found in the tropical parts of New Holland.

Santolina; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common hemispherical, imbricate; scales ovate-oblong, acute, pressed close. *Corolla:* compound uniform, longer than the calix; corollets hermaphrodite, equal, numerous; proper one-petalled, funnel-form; border five-cleft, revolute. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubulous. *Pistil:* germen four-cornered, oblong; style filiform, length of the stamina; stigmas two, oblong, depressed, truncate. *Pericarp:* none, except the unchanged calix. *Seeds:* solitary, oblong, four-cornered. *Down:* none. *Receptacle:* chaffy, flattish; chaffs with concave scales. Essential Character. *Calix:* imbricate, hemispherical. *Down:* none. *Receptacle:* chaffy.——The species are,

1. Santolina Chamæ-cyparissus; *Common Lavender Cotton.* Peduncles one-flowered; leaves toothed four ways. Stalk shrubby, dividing into many woody branches; leaves copious, soft, and hoary, with a powerful and very peculiar scent when bruised; flowers deep yellow. This plant will rise nearly three feet high in a dry soil and sheltered situation. There are several varieties; as, the Hoary, the Dark Green, and the Rosemary-leaved, all of which Mr. Miller considered as distinct species. Lavender Cotton is acrid, bitter, and aromatic, possessing qualities similar to Southernwood: it is reputed resolvent, corroborant, and diaphoretic. The leaves or flowers in powder may be given in the dose of a drachm as a medicine for worms, or double the quantity of the infusion of the leaves. It is an efficacious though a disagreeable medicine, and is reputed to remove obstructions of the viscera, and by many persons as a cure for the jaundice.—All the plants of this genus are hardy, and will thrive in the open air, provided they be planted in a poor dry soil, for in such ground the plants being stinted, will be better able to resist the cold; and they will have a better appearance than those which are in rich ground, whose branches being long and diffused, are displaced and sometimes broken down by hard rains or strong winds. These plants may be cultivated so as to become ornaments to a garden, particularly in small bosquets of evergreen shrubs, where, if they are artfully intermixed with other plants of the same kind, and placed in the front line, they will make an agreeable variety, especially if care be taken to trim them twice in summer to keep

them within bounds, otherwise their branches are liable to straggle, and in wet weather to be borne down and displaced, which renders them unsightly; but when they are kept in order, their hoary and different-coloured leaves will have a pretty effect in such plantations. They may be propagated by planting slips or cuttings during the spring; they should be put into a border of light fresh earth, and watered and shaded in dry weather until they have taken root, after which they will require no further care, but to keep them clear from weeds till autumn, when they should be carefully taken up, and transplanted whither they are intended to remain. If the ground should not be ready, let them remain in the border until spring; for if they are transplanted late in autumn, they are apt to be destroyed by cold in winter. They may be also raised from seeds, sown in the spring on beds of light earth: they will come up the same year, and in autumn may be pricked out at half a foot distance; and when a year old be transplanted to where they are to remain.

2. Santolina Rosmarinifolia; *Rosemary-leaved Lavender Cotton.* Peduncles one-flowered; leaves linear, tubercled at the edge; stalk shrubby, about three feet high, terminated by large, single, globular flowers, of a pale sulphur colour. It flowers from July to September.—Native of Spain.

3. Santolina Fragrantissima; *Sweet-smelling Lavender Cotton.* Flowers corymbed; leaves ovate, crenulate.

4. Santolina Alpina; *Alpine Lavender Cotton.* Peduncles one-flowered; leaves bipinnate; stems simple.—Native of Tuscany; found among ruins of rocks, flowering in June.

5. Santolina Anthemoides; *Chamomile-leaved Lavender Cotton.* Peduncles one-flowered; leaves bipinnate; stem very much branched, and villose.—Native of Spain, Italy, &c.

6. Santolina Maritima; *Sea Lavender Cotton.* Peduncles corymbed; leaves oblong, blunt, crenate, densely woolly. See *Athanasia Maritima.*

7. Santolina Montana; *Mountain Lavender Cotton.* Stalks single-flowered; leaves doubly pinnatifid, smooth, with appendages at the base; stems simple.—Found on mount Athos.

8. Santolina Suaveolens. Plant glabrous; stem corymbose-branchy; leaves subbipinnatifid; segments acute, linear; peduncles terminal, uniflorous; flowers yellow.—Grows on the banks of the Kooskoosy. This is a small plant, of an agreeably sweet scent.

Sapindus; a genus of the class Octandria, order Trigynia.—Generic Character. *Calix:* perianth four-leaved, spreading; leaflets subovate, almost equal, flat, spreading, coloured, deciduous, two of them exterior. *Corolla:* petals four, ovate, clawed, two of them more approximating; nectary of four oblong, concave, erect leaflets, inserted into the base of the petals; glands four, roundish, similarly situated. *Stamina:* filamenta eight, length of the flower; antheræ cordate, erect. *Pistil:* germen triangular; styles three, short; stigmas simple, obtuse. *Pericarp:* capsules three, fleshy, globular, connate, inflated. *Seed:* nut globular; (according to Gærtner, two-celled.) *Observe.* The three capsules seldom all come to maturity. Essential Character. *Calix:* four-leaved. *Petals:* four. *Capsule:* fleshy, connate, ventricose.——The species are,

1. Sapindus Saponaria; *Common Soap-berry Tree.* Unarmed: leaves pinnate; leaflets lanceolate; rachis winged. Stalk woody, from twenty to thirty feet high, sending out many branches towards the top, which are garnished with winged leaves. The flowers are produced in loose spikes at the end of the branches. They are succeeded by oval berries as large as middling cherries, sometimes single, at other times two, three, or four, are jointed together; these have a saponaceous skin or cover, which encloses a very smooth roundish nut of the same form, and of a shining black when ripe. These nuts were formerly brought to England for buttons to waistcoats; some were worn tipped with silver, and others with different metals; they were very durable, and they seldom broke. The skin or pulp which surrounds the nuts is used in America to wash linen, and from this the plant obtains its name. Loureiro celebrates it as a very excellent soap; and in reply to the objection, that being of a very acrid nature they burn and destroy the linen when often used, he remarks, that it is only because they are carelessly used, all abstergents being in some degree corrosive. The seed-vessels, says Dr. Patrick Browne, are very detersive and acrid; they lather freely in water, and will cleanse the linen more than sixty times their weight of soap, but they are observed to corrode or burn the linen in time; and even the water in which the tops of leaves have been steeped or boiled, is observed to acquire a portion of the same quality. The whole plant, especially the seed-vessels, being pounded and steeped in ponds, rivulets, or creeks, is observed to intoxicate and kill the fish. The plants of this genus are propagated by seeds, which must be obtained from the country where they naturally grow. The seeds must be planted in small pots filled with rich fresh earth, and plunged into a hot-bed of tanners' bark. The pots must be frequently watered, otherwise the berries, the outer covers of which are very hard, will not vegetate. In five or six weeks the plants will appear, and then the glasses of the hot-bed should be daily raised to admit fresh air. In a month or six weeks' time after they appear, they will be fit to transplant, and must be shaken out of the pots, and carefully parted, so as not to injure their roots; each to be replanted in a separate small pot filled with light rich earth, and then plunged into the hot-bed again, observing to shade them from the sun every day until they have taken new root; after which they will require the admission of free air every day in warm weather, and also to be frequently watered. When well rooted, they will make great progress, so as to fill the pots with their roots in a few weeks' time, therefore they should be shifted into large pots, and gradually inured, as they advance, to the open air; for they seldom survive the winter, after being much forced in the summer. In the beginning of autumn they should be removed into the bark-bed of the stove.

2. Sapindus Longifolius; *Long-leaved Soap-berry Tree.* Leaves pinnate; leaflets lanceolate, smooth, one terminating; rachis simple. Unarmed.—Supposed to be a native of the East Indies.

3. Sapindus Spinosus; *Thorny Soap-berry Tree.* Leaves abruptly pinnate; stem very thorny. This shrub is very remarkable for the prickliness of its trunk, which seldom exceeds seven or eight feet in height, and two or three inches in diameter.—Native of Jamaica, in the borough of St. James's, where it is called the *Licca Tree.*

4. Sapindus Laurifolius; *Bay-leaved Soap-berry Tree.* Leaves pinnate; leaflets ovate-oblong, pointed, smooth; rachis simple; petals tomentose at the edges. A tall, stout, evergreen tree.—Native of Malabar.

5. Sapindus Emarginatus; *Notch-leaved Soap-berry Tree.* Leaves pinnate; leaflets oblong, emarginate, villose beneath; rachis simple; petals tomentose at the edge. Unarmed.—Found on the coast of Coromandel.

6. Sapindus Rubiginosus; *Rusty Soap-berry Tree.* Leaves pinnate; leaflets oblong, lanceolate, acute, villose beneath; rachis simple; petals smooth. It differs from the preceding, in the leaflets being five-paired, longer, acute, not three-

paired, emarginate.—This is a large timber-tree, growing in the mountainous parts of the Circars, and flowering about the beginning of the hot season. The Telingas call it Ishy-rashy. The wood is very useful for a variety of purposes, being large, straight, strong, and durable: towards the centre it is of a chocolate colour.

7. Sapindus Tetraphyllus; *Four-leaved Soap-berry Tree.* Leaves pinnate; leaflets lanceolate-oblong, smooth; rachis simple; racemes almost simple; petals smooth. Unarmed.—Native of the East Indies.

8. Sapindus Rigidus; *Ash-leaved Soap-berry Tree.* Leaves pinnate; leaflets ovate-oblong; rachis simple; petals and fruits smooth. Unarmed.—Native of the West Indies.

9. Sapindus Arborescens; *Arborescent Soap-berry Tree.* Leaves pinnate; leaflets ovate, acuminate, smooth; panicle axillary, simple. This is a tree seven or eight feet high.—Native of the woods of Guiana.

10. Sapindus Frutescens; *Frutescent Soap-berry Tree.* Leaves pinnate; leaflets alternate, lanceolate, acuminate, smooth; panicle axillary, simple. Stem about eight feet high, leafy at the top; bark rough and ash-coloured; wood brittle and whitish. The fruit is borne from the bosoms of the leaves, and is a dry coriaceous capsule, of a beautiful red colour.—Found at Cayenne.

11. Sapindus Edulis; *Esculent Soap-berry Tree*, or *Chinese Lee Chee.* Unarmed: leaves pinnate; leaflets lanceolate, oblong; rachis simple; fruits muricate, or berries cordate-scaly. The berry is of the size of a date. Its stone, which is long and hard, is covered with a soft juicy pulp, of an exquisite taste. This pulp is enclosed in a tough, thin, brownish, warty skin. This delicious fruit is said to be dangerous when eaten to excess, occasioning eruptions over the whole body. The Chinese suffer it to dry till it becomes black and shrivelled like prunes. Thus they preserve it all the year, and use it in their tea, to which it communicates an acidity, which they prefer before the sweetness of sugar.—Native of China, Tonquin, and Cochin-china.

12. Sapindus Mukorossi; *Japan Soap-berry Tree.* Leaves alternately unequally pinnate; leaflets subsessile, ovate, or lanceolate, entire, smooth.—Native of Japan.

13. Sapindus Abruptus; *Abrupt-leaved Soap-berry Tree.* Unarmed: leaves abruptly pinnate; leaflets lanceolate, quite entire, smooth.—This large tree is a native of China, near Canton.

Saponaria; a genus of the class Decandria, order Digynia. —Generic Character. *Calix*: perianth one-leafed, naked, tubular, five-toothed, permanent. *Corolla*: petals five; claws narrow, angular, length of the calix; border flat, with the plates wider outwards, blunt. *Stamina*: filamenta ten, awl-shaped, length of the tube of the corolla, alternately inserted into the claws of the petals, five later; antheræ oblong, blunt, incumbent. *Pistil*: germen subcylindrical; styles two, straight, parallel, length of the stamina; stigmas acute. *Pericarp*: capsule length of the calix, covered, one-celled, oblong. *Seeds*: numerous, small. *Receptacle*: free. *Observe.* The figure of the calix differs in the different species. Essential Character. *Calix*: one-leafed, naked. *Petals*: five, clawed. *Capsule*: oblong, one-celled.——The species are,

1. Saponaria Officinalis; *Common Soapwort.* Calices cylindrical; leaves elliptic-lanceolate. Root perennial, striking deep, and spreading wide, and creeping by runners; stems a foot and half in height, upright, round, rigid, jointed, smooth, often reddish, panicled at top. There is a variety with double flowers preserved in gardens; but it has the same fault with the single one, of spreading very much at the root. Another variety, the hollow-leaved, has shorter and thicker stalks, that do not grow so erect, neither do its roots spread so much. The leaves are produced singly on the lower part of the stalks, but towards the top they are often placed by pairs; they are about three inches long and two broad, having several longitudinal veins or plaits, and hollowed like a ladle. These plants are easily propagated by parting the roots in autumn, or early in spring, in a moist shady situation. The hollow-leaved variety may be increased by slips or cuttings: it is a hardy perennial, loves a pure air and dry situation, grows best among stones or out of a wall, and is one of the best plants for ornamenting rock-work. Most of the other plants of this genus are propagated by seeds, sown where they are to remain.—This species derives its English and Latin names from its quality of forming, like soap, a lather with water, and taking out spots of grease, &c. from cloth, in the same manner; whence it has also been called the *Fuller's herb.* The whole plant is bitter: a decoction of it, externally applied, cures the itch. The Germans use it instead of Sarsaparilla, in venereal complaints; and M. Andry of Paris, cured violent gonorrhœas, by giving half an ounce of the inspissated juice daily. By the use of the extract, and a decoction of the leaves and roots, M. Jurine is said even to have cured old venereal complaints, which resisted the use of mercury. This, however, is extremely doubtful, and therefore no dependence should be placed upon such rare and ill-authenticated instances; for Dr. Woodville observes, that a fancied resemblance of the roots of this plant to those of Sarsaparilla, seems to have led medical men to think them similar in their effects. Boerhaave, as Haller informs us, entertained a high opinion of its efficacy in jaundice, and other visceral obstructions.

2. Saponaria Vaccaria; *Perfoliate Soapwort.* Calices pyramidal, five-cornered; leaves ovate, acuminate, sessile. Annual.—Native of Germany, Switzerland, France, and Italy. There is a variety found in Spain.

3. Saponaria Cretica; *Cretan Soapwort.* Calices five-cornered, striated; stem erect, subdichotomous; leaves awl-shaped.—Native of Candia.

4. Saponaria Porrigens; *Hairy Soapwort.* Calices cylindrical, pubescent; branches very much divaricate; fruits pendulous. Annual. It flowers in July and August.—Native of the Levant.

5. Saponaria Illyrica; *Illyrian Soapwort.* Calices subcylindrical; stem erect, viscid, purplish; branches alternate; corollas dotted; antheræ violet-coloured.

6. Saponaria Ocymoides; *Basil-leaved Soapwort.* Calices cylindrical, villose; stems dichotomous, procumbent, leaves elliptical; petals nearly entire. An elegant plant.—Native of Italy, Austria, Switzerland, France, and Barbary, on mountains, covering the rocks with beautiful large tufts of rose-coloured flowers.

7. Saponaria Orientalis; *Small Annual Soapwort.* Calices cylindrical, villose; stem dichotomous, erect, patulous. This is a low annual plant, seldom rising above four inches high. —Native of the Levant.

8. Saponaria Lutea; *Yellow Alpine Soapwort.* Calices round, both they and the stem rough-haired; petals obovate, quite entire; flowers corymbed; leaves linear-lanceolate, channelled; root woody, crooked, branched, forming tufts.—Native of the mountains of Switzerland and Savoy.

9. Saponaria Bellidifolia. Calices round, rough-haired; stem smooth; petals linear, crenate; leaves spatulate.—This very rare plant was gathered on the summits of some mountains in Italy.

Sapota. See *Achras.*

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SARRACENIA PURPUREA — *Side-Saddle Flower.*

SAXIFRAGA — *Mountain Pyramidal Saxifrage.*

Published by Henry Fisher, Caxton, Liverpool. April, 1819.

D.W. Campbell sc.

Saraca; a genus of the class Diadelphia, order Hexandria. —Generic Character. *Calix:* none. *Corolla:* one-petalled, funnel-form; border five-parted; segments ovate, spreading, the upper one more remote; throat with an elevated rim. *Stamina:* filamenta six, setaceous, declined, placed on the throat, three on each side, connate at the base; antheræ furnished with a spur. *Pistil:* germen pedicelled, oblong, compressed, length of the stamina; style awl-shaped, declined, length of the germen; stigma obtuse. *Pericarp:* legume. Essential Character. *Calix:* none. *Corolla:* funnel-form, four-cleft. *Filamenta:* three on each side the throat. *Legume:* pedicelled.——The only known species is,

1. Saraca Indica. Leaves alternate, abruptly pinnate; leaflets three or four paired, oblong, petioled; flowers in panicles, composed of alternate racemes or spikes; with subimbricate ovate-lanceolate bractes, opposite, in pairs. This plant is but little known.—Native of Java.

Sarothra; a genus of the class Pentandria, order Trigynia. —Generic Character. *Calix:* perianth one-leafed, five-parted, erect, permanent; segments linear, acute. *Corolla:* petals five, commonly lanceolate-linear, obtuse, patulous, a little longer than the calix, deciduous. *Stamina:* filamenta five, filiform, length of the corolla; antheræ roundish. *Pistil:* germen ovate; styles three, filiform, length of the germen; stigmas simple. *Pericarp:* capsule oblong, acute, one-celled, three-valved, coloured. *Seeds:* numerous, kidney-form, very small, fastened to the sutures of the capsule. Essential Character. *Calix:* five-parted. *Corolla:* five-petalled. *Capsule:* one-celled, three-valved, coloured. ——The only known species is,

1. Sarothra Gentianoides. Stem and branches subtrichotomous; leaves very small, narrow, and awl-shaped; flowers axillary, solitary, sessile. This herb is a good vulnerary. It flowers in July.—Native of Virginia, Pennsylvania, and Philadelphia, growing abundantly in the fields and under the bushes in a dry sandy ground.

Sarracenia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth double: lower three-leaved; leaflets ovate, very small, deciduous: upper five-leaved; leaflets subovate, very large, coloured, deciduous. *Corolla:* petals five, ovate, bent in, covering the stamina; claws ovate-oblong, straight. *Stamina:* filamenta numerous, small; antheræ simple, oblong. *Pistil:* germen roundish; style cylindrical, very short; stigma peltate, dilated, five-cornered, covering the stamina, permanent. *Pericarp:* capsule roundish, five-celled. *Seeds:* numerous, roundish, acuminate, small. Essential Character. *Calix:* double, outer three-leaved, inner five-leaved. *Corolla:* five-petalled. *Capsule:* five-celled, with the *Style* having a shield-like stigma.——The species are,

1. Sarracenia Flava; *Yellow Side-saddle Flower.* Leaves erect, tubular; valves with a contracted neck; top flat, erect. The flowers grow on naked pedicels, rising from the root to the height of three feet, and are of a green colour. It flowers in June and July. Native of Carolina and Virginia, upon bogs and in shallow standing waters.—The plants of this genus are esteemed for the singular structure of their leaves and flowers, which have little resemblance of any yet discovered; but there is some difficulty in getting them to thrive in England, when they are obtained from abroad; for as they grow naturally in bogs, or in shallow standing waters, unless constantly kept wet they will not live, and though the winters are very sharp in the country where the fourth species naturally grows, yet being covered with water, and the remains of decayed plants, it is thereby defended from the frost. The best method is, to procure the plants from the places of their natural growth, and to have them taken up with large balls of earth to their roots, and planted in tubs of earth. They must be constantly watered during their passage, or they will decay before they arrive. There is little probability of raising these plants from seeds, so as to produce flowers in many years, even if the seeds should grow; and on this account young plants must be imported, especially as they are more likely to stand here than those which have flowered two or three times. When they arrive, plant them in pretty large pots, filled with soft spongy earth, mixed with rotten wood, moss, and turf, in which they naturally grow. The pots should be put into tubs or large pans which will hold water, to afford them a constant supply of it; place them also in a shady situation in the summer time, but during winter cover them with moss, or shelter them under a frame, without which they will be destroyed by frost.

2. Sarracenia Minor; *Small Side-saddle Flower.* Leaves smaller, tubular, erect; valve concave, nodding.—Native of Carolina, in bogs.

3. Sarracenia Rubra; *Red Side-saddle Flower.* Leaves erect, tubular; valve flat, erect. Flowers on long stalks, purple; leaves small, handsomely marked with purple veins. —Native of Carolina, in bogs and marshes.

4. Sarracenia Purpurea; *Purple Side-saddle Flower.* Leaves cowled, bellying, patulous, bowed. The root strikes deep into the soft earth; and from the root arise five, six, or seven leaves, in proportion to the strength of the plant, of a tubular swelling form, coriaceous, veiny, furnished on the upper side with an irregular longitudinal dilated appendage, and terminating in a wavy, somewhat heart-shaped, spreading border, catching the rain like a funnel. The hollow parts of the leaves have always water standing in them, and the top or ear is supposed in hot dry weather to shrink, and fall over the mouth of the tube, and serve as a lid, to prevent its exhalation. In great droughts, birds and other animals repair to these plants, and seldom fail of finding water.—Found from Canada to Carolina, in cedar swamps, and marshes among bog-moss, flowering in June and July.

Sarsaparilla. See *Smilax.*

Sassafras. See *Laurus Sassafras.*

Satureia; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, striated, erect, permanent; mouth five-toothed, almost equal, erect. *Corolla:* one-petalled, ringent; tube cylindrical, shorter than the calix; throat simple; upper lip erect, blunt, acutely emarginate; lower lip three-parted, spreading, length of the upper lip; segments blunt, of equal length, the middle one a little larger. *Stamina:* filamenta four, setaceous, distant, scarcely the length of the upper lip, the two lower a little shorter; antheræ converging. *Pistil:* germen four-cleft; style setaceous, length of the corolla; stigmas two, tapering. *Pericarp:* none, the calix converging. *Seeds:* four, roundish. Essential Character. *Corolla:* with segments nearly equal. *Stamina:* distant. *Calix:* almost equally five-cleft.——The species are,

1. Satureia Juliana; *Linear-leaved Savory.* Whorls fastigiate; leaves linear-lanceolate. The whole plant has a very pleasant smell. It flowers from May to September, and is a native of Italy.—This, with the second, third, sixth, seventh, and eighth species, are too tender to live through the winter in the open air of our climate. They are generally propagated by slips or cuttings, which take root very readily during any of the summer months. If they are planted in a shady border, or screened from the sun by mats, they will be fit to be transplanted in two months, when they should be taken up carefully, and each put into a small pot filled with fresh

undunged earth, and placed in the shade until they have taken new root; then place them in a sheltered situation, where they may remain till the end of October, when they should be placed under a common hot-bed frame, where they may be exposed to the open air at all times in mild weather, but must be protected from hard frost. As these plants seldom live above three or four years, there should be a supply of young ones raised to preserve the species. In the winter they should not have much wet, for they are very subject to grow mouldy, especially if the air be excluded from them; or if the branches be drawn up weak, they become mouldy, and soon decay.

2. Satureia Thymbra; *Whorled Savory.* Flowers whorled, hispid; leaves oblong, acute. The stem is shrubby, bushy, square, and rough; the leaves have, when bruised, a strong aromatic odour; the flowers are many in each whorl, pale purple, with prominent stamens.—Native of the island of Candia. See the preceding species.

3. Satureia Græca; *Greek Savory.* Peduncles subtriflorous, lateral; involucrets shorter than the calix. This agrees in appearance with the next species, from which it differs in having the leaves less mucronate, but especially in the corymbs of flowers, which are not single on each side, but double.—Native of the Archipelago, and of the county of Nice. See the first species.

4. Satureia Montana; *Winter Savory.* Peduncles lateral, solitary; flowers in bundles, fastigiate; leaves mucronate, linear-lanceolate. Perennial, with a low, shrubby, branching stalk; leaves evergreen, dilated upwards; flowers white, with a lilac tinge, and violet spots.—This plant appears to be a native of the south of France and Italy; but there is good reason to suppose that this and the following species, with other potherbs, were cultivated in remote ages, before the East Indian spices were known and in common use. It may be propagated by seeds, in the same way as the next species; or by slips, which will take root very freely if planted in the spring. It is very hardy, and will continue several years, especially on a poor dry soil, or on a wall: but when the plants are old, the shoots are short, and not so well furnished with leaves; it will be proper therefore to raise a supply of young plants every other year.

5. Satureia Hortensis; *Summer Savory.* Peduncles two-flowered; leaves lanceolate, entire. Annual; with slender erect stalks about a foot high, sending out branches at each joint by pairs; corolla pale flesh-colour.—Native of the south of France and Italy. It is only cultivated by seeds, sown at the beginning of April, upon a bed of light earth, where they are to remain, or for transplanting: if the plants are to stand unremoved, the seeds should be thinly sown. Keep them clean from weeds, and treat them in the same manner as *Marjoram.*

6. Satureia Capitata; *Ciliated Savory.* Flowers in spikes; leaves keeled, dotted, ciliate. Stem bushy; leaves small, crowned; flowers light purple, in copious, dense, terminal spikes. This never seeds in England. It flowers from June to October.—Native of the Levant. See the first species.

7. Satureia Spinosa; *Thorny Savory.* Branches thorny; leaves ovate, hispid. This shrubby species is distinguished by its thorny branches and shaggy leaves.—Native of Candia. See the first species.

8. Satureia Viminea; *Twiggy Savory.* Peduncles axillary, three-flowered; involucres linear; leaves lanceolate-ovate, quite entire. This shrub is from two to twelve feet in height, with an upright stem, very much branched and loose. There are two varieties; one a shrub, smaller and more rigid, with smaller oblong leaves; the other a little tree, twelve or fifteen feet high, with the branches loose, and rounder leaves. The whole plant is very sweet-scented, even when dry.—Native of the mountains of Jamaica. See the first species.

Satyrium; a genus of the class Gynandria, order Diandria.—Generic Character. *Calix:* spathes wandering, spadix simple; perianth none. *Corolla:* petals five, ovate-oblong; three exterior, two interior, converging upwards into a helmet. *Nectary:* one-leafed, annexed to the receptacle by its lower side between the division of the petals; upper lip erect, very short; lower flat, pendulous, prominent in the base behind in a scrotiform bag. *Stamina:* filamenta two, very slender, and very short, placed on the pistil; antheræ obovate, covered by the two-celled fold of the upper lip of the nectary. *Pistil:* germen oblong, twisted, inferior; style fastened to the upper lip of the nectary, very short; stigma compressed, obtuse. *Pericarp:* capsule oblong, one-celled, three-keeled, three-valved, opening in three parts under the keels, cohering at the top and bottom. *Seeds:* numerous, very small, irregular like saw-dust. Essential Character. *Nectary:* scrotiform, or twin, inflated behind the flower.——The species are,

1. Satyrium Hircinum; *Lizard Satyrion,* or *Goaty Orchis.* Bulb undivided; leaves lanceolate; lip of the nectary trifid; middle segment linear, oblique, præmorse. This is the tallest English plant of the tribe, frequently attaining to the height of three feet, and producing from twenty to sixty or more flowers, remarkable for their fetid goat-like smell. The upper part of the lip is downy, and marked with elegant purple spots on a white ground, otherwise the flowers are more singular than beautiful: they are sometimes white; and the plant itself varies in size, and the breadth of the leaves; which circumstances have given occasion to authors to make two species of it.—Native of Germany, Switzerland, Austria, France, Italy, and England, where it is found about Deptford in Kent, flowering from May to June, and some say, in July; but the greediness of collectors has frequently endangered its total destruction, and in some seasons none can be found in flower. It prefers a chalky soil and shaded situation, among shrubs and tall grass.—These plants are difficult to propagate. The best way to obtain them is, to take up their roots, and transplant them into the garden, with a good ball of earth, putting them into a soil as near to that in which they naturally grow as possible, and to leave the ground undisturbed; for if their roots be injured, the plants seldom thrive afterwards.

2. Satyrium Tabulare. Bulbs round; stem leafy; lip trifid; middle segment emarginate.—Found on the Table-mountain at the Cape, whence its name.

3. Satyrium Triste. Bulbs undivided; helmet one-spurred; lip entire. Large and panicled.—Native of the Cape.

4. Satyrium Giganteum. Bulbs round; stem naked; lip sagittate; flowers orange-coloured; plant six feet high.—Native of the Cape.

5. Satyrium Aculeatum. Bulbs round; stem leafy; lip entire, unarmed, prickly.—Native of the Cape.

6. Satyrium Viride; *Frog Satyrion.* Bulbs palmate; leaves oblong, blunt; lip of the nectary linear, trifid; the middle segment obsolete; stem from five to eleven inches high, solid, with unequal sharp angles, formed from the edges of the leaves and bractes.—Native of many parts of Europe, especially in the northern counties. It flowers from the end of May to the beginning of August, and in England is generally found in a gravelly or rocky soil. It has been observed at King's Hedges near Chesterton, and Cherry Hinton, Cambridgeshire; at Stevington, Thurleigh, Bletsoe, Pertenhall, Luton Hor, Bedfordshire; in the way to Glenfield from Leicester; at Braybrook and Forster's Booth in

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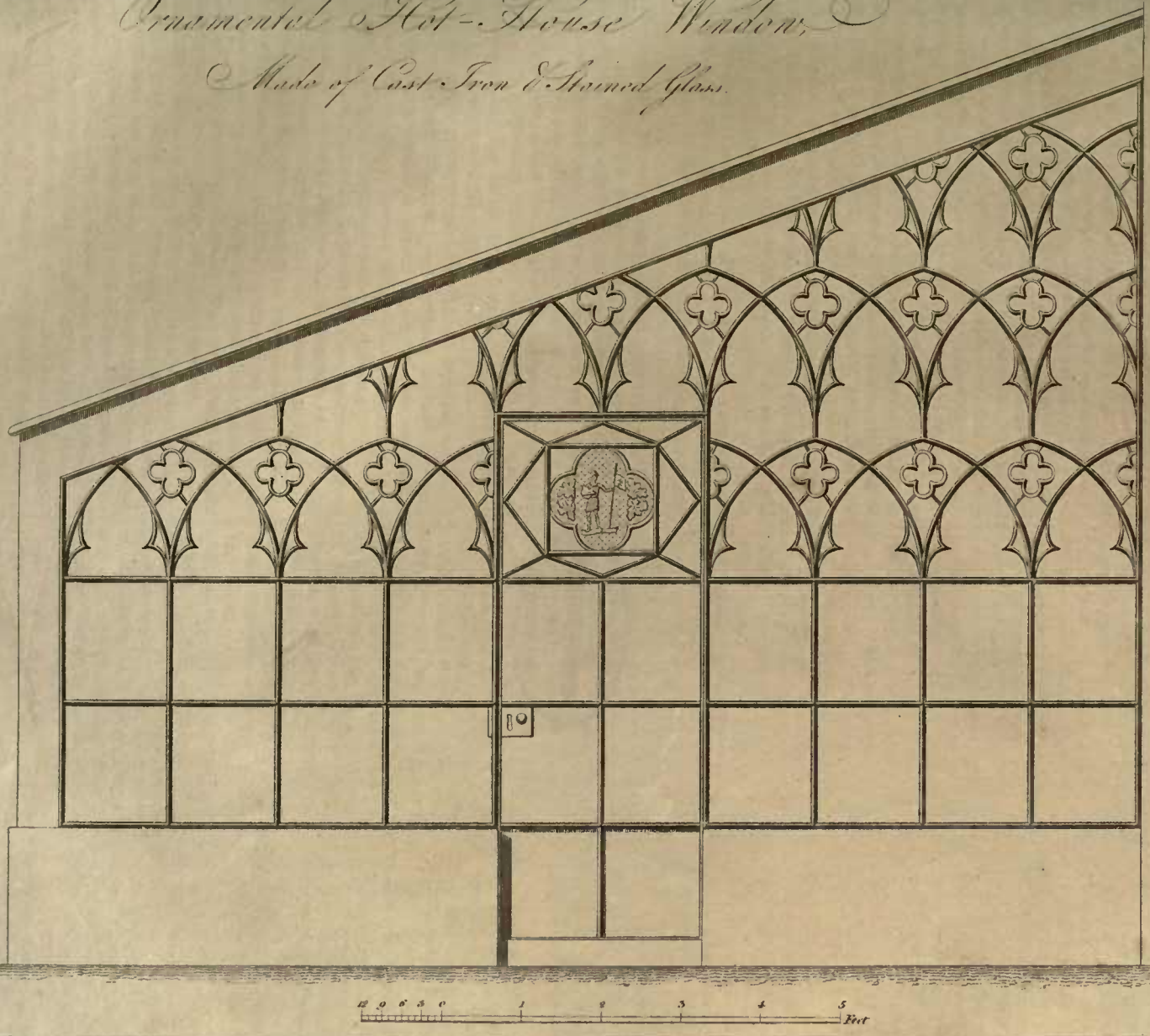

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Northamptonshire; at Shotover hill, South Leigh, Cornbury, and Burford downs, Oxfordshire; at Thaxted in Essex; on Helse-Fellnap, near Kendal in Westmoreland; also occasionally in Dorsetshire, Yorkshire, and Scotland. See the first species.

7. Satyrium Nigrum; *Black-flowered Satyrion.* Bulbs palmate; leaves linear; lip of the nectary resupine, undivided; stem about nine inches high.—Native of Dauphiny.

8. Satyrium Albidum; *White Satyrion.* Bulbs in bundles; leaves lanceolate; lip of the nectary trifid, acute, the middle segment blunt; stem from nine to fifteen inches high.—It flowers in June and July; and is a native of Scania, Denmark, Germany, Switzerland, Austria, Dauphiny, Piedmont, Pistoia, and Great Britain, in all of which it is found upon exposed grassy hills or dry mountainous pastures; as upon the mountains north of Helmsley in Yorkshire; at the isthmus of Tarbat, in Cantyre, Argyleshire; on the isle of Arran near Loch Rausa; in Jura, Isla, Colonsay, and Skye; and at Hafod in Cardiganshire. See the first species.

9. Satyrium Epigogium. Bulbs compressed, toothed; stem sheathed; lip of the nectary resupine, undivided; root tender, branched like coral, snow-white.—Native of Austria, Dauphiny, and Siberia.

10. Satyrium Hirtellum. Bulbs filiform; stem hirsute; leaves ovate, three-nerved, petioled, sheathing; horn of the nectary thickened; lip two-lobed, middle acuminate.—Native of Jamaica.

11. Satyrium Plantagineum. Bulbs filiform; stem very smooth; leaves ovate, petioled, sheathing; horn of the nectary thickened; lip two-lobed, middle acuminate; roots filiform, long, tomentose.—Native of Jamaica and Martinico, in moist woods and shady places.

12. Satyrium Adnatum. Bulbs in bundles; root-leaves oblong, on very long petioles; scape sheathed; nectary horned, adnate; lip bent down, two-lobed, emarginate.—Native of Jamaica and Hispaniola.

13. Satyrium Orchioides. Bulbs in bundles, oblong; leaves broad-lanceolate; scape sheathed; nectary horned; lip lanceolate-acuminate. Stem twelve or fourteen inches high, without leaves; flowers flesh-coloured, oblong, and succulent.—Native of Jamaica and Hispaniola.

14. Satyrium Spirale. Bulbs in bundles, oblong; leaves linear; scape sheathed; flowers spiral, directed one way; lip three-lobed, middle larger, crenulate.—Native of Jamaica.

15. Satyrium Elatum. Bulbs in bundles, thick, tomentose; root-leaves ovate, petioled; stem almost naked; nectary subtrilobate.—Native of Jamaica and Hispaniola.

16. Satyrium Repens; *Creeping Satyrion.* Bulbs fibrous; leaves ovate, radical; flowers directed one way. Root perennial, truly creeping, not bulbous, very succulent, downy, running among Moss, and attaching themselves to decayed fragments and leaves of Fir, in the manner of Fungi; stalks erect, terminated with an erect spike of numerous pale, flesh-coloured, fragrant flowers, leaning one way, but turning a little spirally round the stalk.—Native of Lapland, Norway, Denmark, Switzerland, Austria, Siberia, and Scotland, where it occurs in Alpine Fir-forests, and flowers from June to August. See the first species.

17. Satyrium Capense. Lip of the nectary wider, blunt, emarginate, waved on both sides.—Native of the Cape.

18. Satyrium Hyans. Helmet of the corollas spurred, gaping; nectary ovate; leaves linear, radical.—Native of the Cape.

19. Satyrium Orobanchoides. Helmet of the corolla behind two-lobed, and in a manner two-horned; leaves bifarious, linear, cauline.—Native of the Cape.

20. Satyrium Pedicellatum. Scape almost naked; raceme with filiform loose pedicels.—Native of the Cape.

21. Satyrium Maculatum. Flowers in close spikes; segments converging, acute; lip three-lobed; lobes linear, very narrow, the middle one longer.—Native of Mount Atlas, near Belide.

Savine. See *Juniperus.*

Savory. See *Satureia.*

Saururus; a genus of the class Heptandria, order Tetragynia.—Generic Character. *Calix:* ament oblong, covered with floscules; perianth proper one-leafed, oblong, lateral, coloured, permanent. *Corolla:* none. *Stamina:* filamenta seven, capillary, long; antheræ oblong, erect. *Pistil:* germina four, ovate, acuminate; style none; stigmas oblong, fastened to the apex of each germen. *Pericarp:* berries four, ovate, one-celled. *Seed:* single, ovate. Essential Character. *Calix:* an ament, with one-flowered scales. *Corolla:* none. *Germina:* four. *Berries:* four, one-seeded.——The only known species is,

1. Saururus Cernuus; *Lizard's Tail.* Root perennial, somewhat creeping; stems simple, round, leafy, rising a foot above the water; leaves heart-shaped and smooth, about three inches long, and two broad at their base, ending in obtuse points, and having several longitudinal veins which join at the footstalk, but diverge from the midrib towards the borders in the middle, and join again at the point; spikes of flowers solitary, greenish-white, axillary, appearing in August and September.—Native of Virginia, and of most parts of North America, in swamps and shady wet woods. It is propagated by parting the roots in autumn, or in the spring before the roots begin to shoot, in a moist soil and shaded situation.

Sauvagesia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted; leaflets lanceolate, acute, concave, spreading, permanent. *Corolla:* petals five, blunt, equal, rhomb-ovate, length of the calix. Nectary leaflets five, smaller, alternate with the petals, oblong, erect, surrounded by many short hairs. *Stamina:* filamenta five, awl-shaped, very short; anthcræ oblong, acute, short. *Pistil:* germen ovate; style simple, the length of the stamina; stigma simple, blunt. *Pericarp:* capsule ovate, acuminate, one-celled, three-valved at the top. *Seeds:* numerous, very small, fastened to the sutures in a longitudinal row. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Nectary:* five-leaved, encompassed by hairs, alternate with the petals. *Capsule:* one-celled.—The species are,

1. Sauvagesia Erecta. Stem branched, leafy; leaves small, oblong, smooth, on the upper side very lightly crenated, and disposed in an alternate but irregular order; they are on short footstalks, and adorned with remarkably ciliated ears or stipules on each side at their insertions; flowers axillary, solitary, on short stalks, with white petals; the calix often purple.—Native of Saint Domingo, Martinico, Jamaica, Surinam, and Guiana.

Saxifraga; a genus of the class Decandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, five-parted; segments short, acute, permanent. *Corolla:* petals five, spreading, narrow at the base, *Stamina:* filamenta ten, awl-shaped; antheræ roundish. *Pistil:* germen roundish, acuminate, ending in two short styles; stigmas blunt. *Pericarp:* capsule subovate, two-beaked, one-celled, opening between the points. *Seeds:* numerous, minute. Essential Character. *Calix:* five-parted. *Corolla:* five-petalled. *Capsule:* two-beaked, one-celled, many-seeded.——The species are,

* *Leaves undivided; Stem almost naked.*

1. Saxifraga Cotyledon; *Pyramidal Saxifrage.* Root-leaves aggregate, tongue-shaped, cartilaginous-toothed; stem panicled, leafy; calices glandular, hairy; petals unspotted. Stem five or six inches high, but two or three feet when cultivated, reddish, hairy, bearing several alternate leaves; its flowering-branches slender, purplish, hairy and viscid, repeatedly subdivided; petals obovate, three-ribbed, pure white. There are several varieties of this species. When the plants are strong, they produce very large pyramids of flowers, which make a fine appearance, and being kept in the shade, and screened from wind and rain, will continue in beauty a considerable time.—They all flower in June, and are natives of the Alps and Pyrenees. This species is easily propagated by offsets, which are put out from the side of the old plants in abundance. Plant them in pots filled with fresh light earth, placing them in the shade during summer, but exposed to the sun in winter. Take off all the offsets, leaving the plants single, which will cause them to produce a much stronger stem for flowering. Plant the offsets in separate halfpenny-pots, to succeed the old plants, which generally perish after flowering. They will produce flowers the second year.

2. Saxifraga Aizoon; *Marginated Saxifrage.* Root-leaves aggregate, tongue-shaped, cartilaginous-toothed; stem simple, racemed, leafy; calices smooth; petals dotted.—Native of the Alps. To be treated in the same manner as the preceding species.

3. Saxifraga Mutata; *Saffron-coloured Saxifrage.* Root-leaves aggregate, tongue-shaped, with a cartilaginous, somewhat notched, fringed border; stem racemed, leafy; calices glandular, hairy; petals lanceolate. The whole of this plant is covered with viscid hairs. The stalk is about a foot high, and much branched; but its great peculiarity consists in its flowers, the petals being long, narrow, and pointed, of a deeper colour when they first ripen, but gradually changing from saffron to a pale yellow; and the beauty of the flowers is heightened by a glandular substance in the centre of each, which, when the flower expands, is of a bright purple colour. —Native of the mountains of Switzerland. See the first species. It must be sheltered from wet, and severe frost.

4. Saxifraga Pennsylvanica; *Pennsylvanian Saxifrage.* Leaves oblong, lanceolate, somewhat hairy, toothletted; stem naked, one to two feet high; peduncles alternate; corymb capitate; root perennial, fibrous. It flowers in May and June.—Native of North America. This may be increased by parting the roots, and planting in a moist soil and shady situation: it is never injured by cold.

5. Saxifraga Hieracifolia. Leaves oblong-lanceolate, smooth, repand-toothed; stem naked; peduncles one-flowered, aggregate. This so much resembles the preceding that it seems at first sight to be the same, but it is distinct in its manner of flowering.—Native of the Carpathian mountains.

6. Saxifraga Androsacea. Leaves lanceolate, blunt, hairy; stem naked, two-flowered.—Native of Switzerland, Austria, Dauphiny, Piedmont, and Siberia.

7. Saxifraga Cæsia; *Grey Saxifrage.* Leaves linear, perforate-dotted, aggregate, recurved; stem many-flowered; root creeping, long, branched, covered with brown scales. There is a variety from the high mountains of Italy, the stem of which is double the size of the other, hirsute, and viscid. —Native of the Alps, Pyrenees, and Austria.

8. Saxifraga Burseriana. Leaves aggregate, imbricate, three-sided, subulate-even; flowers milk-white, with pale lines.—Native of Carinthia.

9. Saxifraga Sedoides. Leaves aggregate, alternate, and opposite, sublanceolate; flower peduncled. This varies very much in its habit, height, and leaves.—Observed in Carinthia, and in several parts of Switzerland and the Valais.

10. Saxifraga Tenella. Leaves lanceolate, mucronate, ciliate at the base, imbricate; stem almost naked, few-flowered; calices mucronate.—Native of the mountains of Carinthia.

11. Saxifraga Bryoides; *Bryum Saxifrage.* Leaves lanceolate, mucronate, cartilaginous at the edge, and ciliate; stem almost naked, and few-flowered; calices obtuse.—Native of the Alps, Pyrenees, Austria, Dauphiny, Piedmont, &c.

12. Saxifraga Bronchialis. Leaves imbricate, subulate, ciliate, spiny; stem almost naked, many-flowered.—Native of Siberia.

13. Saxifraga Stellaris; *Starry* or *Hairy Saxifrage*, or *Kidneywort.* Leaves serrate; stem naked, branched; petals acute; capsule superior; roots perennial, long, fibrous, crowned with flat stellate tufts of cuneiform leaves.—Native of the mountains of Spitzbergen, Lapland, Switzerland, Styria, Dauphiny, Piedmont, Siberia, and Britain. In our northern counties, Westmoreland, Cumberland, Lancashire, Yorkshire; in Wales, Scotland, and Ireland; where it is found on the black turfy margins of rills, on the north sides of the mountains, towards their summits, flowering in June and July.

14. Saxifraga Crassifolia; *Thick-leaved Saxifrage.* Leaves oval, retuse, obscurely serrate, petioled; stem naked; panicle conglomerate; root superficial, black, scaly with the relics of dead leaves. After the plant has flowered, the stem puts forth branches from the axils of the leaves, which have the panicle of flowers for the next year included in their gems. The flowers are purple, but when they fade, turning blue. The root is white within, and very styptic or astringent when chewed. The stem changes every year into root: that which flowers one year losing its leaves during the winter, turning to the ground, becoming black, and putting forth fibres.—Native of the mountains of Siberia: a common hardy perennial in our gardens. This is readily increased by parting the roots either in spring or autumn. It flowers early, and if cold winds prevail at that time, should be covered with a hand-glass; or if in a pot, it may be removed into a green-house.

15. Saxifraga Nivalis; *Snowy* or *Clustered Alpine Saxifrage*, or *Seagreen.* Leaves obovate, serrate; stem naked; flowers heaped; capsule half inferior; roots perennial, black, sending down long fibres into the black moist ground. Scarcely any plant is subject to more variations in appearance and size than this species. Sometimes it is exceedingly small, with heart-shaped leaves, flowers collected into a single head, and a strap-shaped leaf at the base. Sometimes it produces only a single flower on the stalk; and sometimes two of these rise from one root. At other times it bears a number of flowers at the top of the stalk, on fruitstalks forming an umbel; and sometimes it appears twice as large.—Native of Britain, Spitzbergen, Lapland, Virginia, and Canada. It flowers in August, and is the most alpine of our British Saxifrages, being found only on the summits of the highest mountains in Scotland and Wales. It requires a shady situation, and a loamy soil.

16. Saxifraga Bellardi. Stemless: leaves roundish, repand; flower sessile.—Native of the Piedmont Alps, on moist mossy rocks.

17. Saxifraga Daurica. Leaves cuneiform, rhombed, toothed at the end, smooth, petioled; stem naked.—Native of the highest Alps of Dauria.

18. Saxifraga Sarmentosa; *Chinese Saxifrage.* Leaves roundish, toothed, hairy; runners creeping; two of the petals elongated. Its round variegated leaves, and Strawberry-like runners, with the uncommon magnitude of the two lower pendent petals, joined to the very conspicuous glandular

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P. 598

GENISTA — *Triangular Genista, or Broom.*

SAXIFRAGA — *Mountain Sanicle.*

SAXIFRAGA — *London Pride.*

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nectary in the centre of the flower, half surrounding the germen, render this species strikingly distinct.—This elegant plant flowers in June and July, and is a native of China and Japan. This increases so fast by runners as to be even troublesome. It is properly a green-house plant: in mild winters indeed it will bear the open air, especially if placed at the foot of a wall, or among rock, though in severe seasons it is often killed in such situations.

19. Saxifraga Punctata. Leaves roundish, toothed, on a long petioled stem, naked.—Native of Siberia.

20. Saxifraga Umbrosa; *London Pride*, or *None-so-pretty*. Leaves obovate, subretuse, with a cartilaginous notched margin; stem naked, panicled; capsule superior; petals obovate-lanceolate, white or flesh-coloured, most beautifully dotted with yellow and dark red. Stem from nine to eighteen inches high, erect, panicled, red, and hairy; flowers numerous, erect, scentless; calix reddish; petals obtuse, white or flesh-coloured, spotted with yellow near the base, and dark red towards the extremity. This is one of the most popular of our garden flowers, thriving amid the smoke of London, and flowering from April to June.—Native of Ireland and England. Found on the Mangerton Mountain two miles from Killarney; on the mountains near Sligo; on Croagh Patrick in the county of Mayo; in Thorparch woods near Weatherby, Yorkshire; and between Horton in Craven, Yorkshire. It flowers in July.—Like many of the other species, these may be propagated by offsets taken off in autumn, and planted in a shady situation.

21. Saxifraga Hirsuta. Leaves cordate-oval, retuse, cartilaginous-crenate; stem naked, panicled; stamina longer than the petals. It flowers in June.—Native of the Pyrenees. Treat it in the same manner as the preceding.

22. Saxifraga Cuneifolia; *Wedge-leaved Saxifrage*. Leaves wedge-shaped, very blunt, repand; stem naked, panicled. It flowers here in May.—Native of Switzerland, Styria, and Dauphiny.

23. Saxifraga Geum; *Kidney-leaved Saxifrage*. Leaves kidney-shaped, toothed; stem naked, panicled. This is distinct from the preceding species, in having the leaves erect. —Native of the European Alps.

24. Saxifraga Serpyllifolia. Plant with small leaves, erect; leaves oval, glabrous; stem one-flowered, with few leaves; petals obovate; flowers large.—Grows on the north-west coast of North America.

25. Saxifraga Virginiensis. The whole plant slightly pubescent; leaves oval, obtuse; stem subaphyllous, paniculate; branchlets dichotomous; flowers subsessile, white.—Grows on rocks and dry hills, from New England to Virginia.

26. Saxifraga Leucanthemifolia. Plant very rough; leaves elongate-spathulate, acutely dentated; stems divaricate-dichotomous; panicles capillary, lax; calix reflex; petals unequal, white, elegantly red and yellow punctated.—This plant rises to the height of about eight inches, and grows on the high mountains of Carolina. It has also been found on the Peaks of Otter, Virginia.

27. Saxifraga Erosa. Plant somewhat glabrous; leaves oblong-lanceolate, acute, erose-dentated; stem naked; panicles oblong; branches divaricate, very branchy, laxiflorous; pedicels filiform. Grows in stony rivulets, on the high mountains of Virginia and Carolina.—This plant has a close affinity to Saxifraga Pennsylvanica.

** *Leaves undivided; Stem leafy.*

28. Saxifraga Oppositifolia; *Purple-flowered Saxifrage*. Stem-leaves ovate, opposite, imbricate, the upper ones ciliate; stems very long, trailing, either forming tufts or hanging down from the crevices of rocks, branched, leafy; the flowering branchlets erect; flowers larger than the leaves, terminal, mostly solitary; petals of a purplish crimson, unspotted. There are several varieties of this beautiful plant, which insinuates its roots into every crevice, and with its numerous trailing branches clothes the rocks with a rich tapestry during the months of April and May; in gardens it flowers two months earlier. As the flowers go off, they incline to blue, and one variety is said to have white flowers. It is very liable to vary from situation: when it grows exposed, it assumes a more compact appearance; the stalks are shorter, the leaves more closely imbricate, and the flowers more numerous. In shady situations, the stalks shoot to a greater length, the leaves are placed at longer intervals, assume a greener hue, and somewhat resemble those of Wild Thyme: in such situations few or no flowers are produced.—To cultivate this plant, at the end of March divide one which has filled a pot the preceding year, into many small pieces, taking care that each piece has a few fibres to it; plant about six of these in the middle of a small pot, filled with a composition of loam and rotten leaves, or bog earth, in equal parts; water them, and set them by in a shady place for about a week, then plunge them in an open border, exposed not more than half the day to the sun; in dry weather water them once a day; and in the ensuing spring each pot will be covered with a profusion of bloom. To continue this beautiful plant, treat it thus every year; and, observe, that as it is very hardy, tender management it is not only needless, but hurtful.

29. Saxifraga Aspera; *Rough Saxifrage*. Stem-leaves lanceolate, alternate, ciliate; stems procumbent. This plant exhibits tufts of leaves, forming dark roses, close to the ground, and younger stalks as it were gems, sessile in the axils of the ciliate leaves; flowers on long, naked, one-flowered branches, three or four in the whole, on the top of the plant.—Native of the mountains of Switzerland, Austria, Provence, Dauphiny, and Piedmont.

30. Saxifraga Hirculus; *Yellow Marsh Saxifrage*. Stem-leaves lanceolate, alternate, unarmed; stem erect; germen ovate, superior. The almost parallel nerves on the calix and petals, clearly distinguish this from the other species. It differs from the next species, particularly in the superior size and form of the petals, by the beautiful orange spots on the lower half of them, and by the two very singular pointed projections towards the base of each.—Native of Lapland, Sweden, England, Germany, Switzerland, Piedmont, and Siberia, in bogs, where it flowers in July and August. It was first found on Knutsford moor, Cheshire. Plant this species in a pot of bog earth, and keep the pot in a pan of water, so that the earth shall be constantly moist: in winter set it under a frame to protect it from frost. It will thrive very well in an open border, if moist, and formed chiefly of bog earth, and throw out shoots which will take root. It may also be increased by cuttings of the shoots, which will strike root under a close glass, towards the close of summer. If kept in a pot, it will require renewing every two or three years.

31. Saxifraga Aizoides; *Yellow Mountain Saxifrage*. Stem-leaves linear, alternate, tooth-ciliate; stem decumbent at the base; germen depressed, half inferior. The roots creep very far. The flowers often form a small corymb, and are extremely beautiful when closely examined, of a more or less deep yellow, spotted with crimson: those which appear first are most deeply coloured.—Native of Lapland, Sweden, Norway, Britain, Switzerland, Carniola, Dauphiny, Silesia, and Piedmont. It is found in bogs, on the mountains in the north of England and Scotland, flowering in July and August.—It is difficult to propagate this species in gardens, unless it be planted upon loose rotten earth, and kept constantly moist.

The difficulty has, however, been in a great measure removed, by having a shady moist border filled with bog earth. In such a border, many elegant plants, of this and various other genera, thrive tolerably well; but some of the alpine species of this genus also require a pure air, and will not thrive within the reach of smoke.

32. Saxifraga Rotundifolia; *Round-leaved Saxifrage.* Stem-leaves kidney-shaped, toothed, petioled; stem panicled; calix inferior. Of this numerous and beautiful genus, we know of none, says Mr. Curtis, the flowers of which, in point of prettiness, can vie with those of the present species; the petals are white, copiously marked with numerous fine crimson dots, and appear to great advantage when viewed with a magnifier.—Native of Switzerland, Austria, Silesia, Dauphiny, and Piedmont. Part the roots early in autumn, that the plants may be well rooted before the dry weather in spring. It succeeds best in a moist shady situation, and a stiffish loam.

33. Saxifraga Setigera. Plant pubescent; radical leaves aggregate, spatulate, acute, spinous-ciliate; stem leafy, subbiflorous; calices hispid; flagella setaceous, very long, upon the axils of the leaves; flowers small, white.—This is a very singular species, growing on the north-west coast of America.

**** Leaves lobed; Flowering-stems erect.*

34. Saxifraga Granulata; *White Saxifrage.* Leaves kidney-shaped, lobed; stem panicled; root granulated; germen half-inferior. It varies with double flowers, and is cultivated in this state.—Native of dry gravelly pastures and meadows, sometimes moist situations or shady banks, in most parts of Europe. This little plant is an excellent diuretic; an infusion of the whole plant operates powerfully and safely by urine, and clears the passages from gravel. The dried roots (which are granulose, or made up of small knobs) were used to be kept by the druggists under the title of Saxifrage seeds; but they are not half so efficacious as when fresh taken out of the ground.—It is increased by offsets, which the old roots put forth in great plenty. Transplant them in July, after the leaves are decayed, into fresh undunged earth, placing them in the shade until autumn, but in winter exposing them to the sun. They will flower in April, and, if produced in large tufts, will make a handsome appearance.

35. Saxifraga Bulbifera; *Bulbous Meadow Saxifrage.* Leaves palmate, lobed; stem-leaves sessile; stem branched, bulbiferous; germen inferior.—Native of Italy, in shady rocky pastures, and of Norway.

36. Saxifraga Cernua; *Drooping Bulbous Saxifrage.* Leaves palmate, petioled; stem bulbiferous; petals retuse; germen superior. Root a small scaly bulb, throwing out branched black fibres. It flowers in July and August.—Native of the mountains of Lapland.

37. Saxifraga Rivularis; *Alpine Brook Saxifrage.* Leaves palmate, petioled, the upper one spatulate; stem few-flowered; root fibrous; germen half-inferior.—Native of the Lapland mountains. Found also by rills and in the wet fissures of rocks, on Ben Nevis in Scotland, flowering in June and July.

38. Saxifraga Geranioides; *Crane's-bill-leaved Saxifrage.* Root-leaves kidney-shaped, five-lobed, multifid; stem-leaves linear; stem almost naked, branched; root stoloniferous.—It flowers in April and May, and is found upon the Pyrenees, by hills and on shady rocks, and also in Siberia.

39. Saxifraga Ajugifolia; *Bugle-leaved Saxifrage.* Root-leaves palmate, five-parted; stem-leaves linear, undivided; stems ascending, many-flowered.—Native of the mountains of Provence.

40. Saxifraga Sibirica; *Siberian Saxifrage.* Leaves kidney-shaped, palmate, hairy; stem and peduncles filiform; root fibrous.—Native of Siberia.

41. Saxifraga Rupestris; *Rock Saxifrage.* Stem-leaves wedge-shaped, three-lobed, toothed, glandular, hairy; peduncles one-flowered, very long; stem ascending, branched at the base.—Native of the mountains of Carinthia.

42. Saxifraga Tridactylites; *Rue-leaved Saxifrage.* Leaves wedge-shaped, trifid or quinquefid, alternate, the upper ones undivided; stem panicled; germen inferior; root annual, small, entirely fibrous.—A strong infusion of the whole plant, fresh gathered, is an excellent sweetener of the blood and juices, and good against scorbutic complaints in general; and there are not wanting well-attested accounts of its having cured the king's-evil, when the use of it has been persevered in. Those who wish to have it for use all the year, should make a syrup of its juice in the spring, or beat the leaves into a conserve with sugar; for the dried plant loses all its virtues, and it is only to be had fresh for a short space of time in the spring.—Common in most parts of Europe, on walls, thatched roofs, and in dry barren places, flowering in April and May. When growing in shady places, it is green, more slender, and long-lived: and in very dry situations the stem is sometimes unbranched, and all the leaves entire.

43. Saxifraga Petræa; *Stone Saxifrage.* Leaves wedge-shaped; root-leaves entire, and three-toothed; stem-leaves five-toothed, upper ones trifid; peduncles subtriflorous.—It flowers in April and May, and is a native of the mountains of Lapland, Norway, Switzerland, Savoy, Carinthia, and Dauphiny. It is an annual plant.

44. Saxifraga Adscendens. Leaves palmate, three-parted; segments subtrifid; stem branched, ascending.—Native of the Alps, Pyrenees, Monte Baldo, and the Hartz forest.

45. Saxifraga Moschata; *Musky Alpine Saxifrage.* Root-leaves aggregate, membranaceous, linear-lanceolate, entire or trifid, triple-nerved; stem almost naked, subbiflorous. The herb is sweet-smelling, and viscid; the roots have a pleasant aromatic flavour; and the leaves are particularly tender like Chinese silk-paper.—Native of Switzerland, the Pyrenees, and Carniola. Dr. Withering found it in the mountains above Ambleside in Westmoreland.

46. Saxifraga Cæspitosa; *Tufted Alpine Saxifrage.* Root-leaves aggregate, fleshy, linear, entire or trifid, nerved beneath; stem almost naked, subbiflorous; roots in tufts. There are several varieties.—Native of the Pyrenees, Norway, and the Piedmontese Alps; flowering in June; and found on the alpine rocks above lake Idwell, Caernarvonshire.

47. Saxifraga Palmata; *Palmate Saxifrage.* Leaves hairy, palmate, quinquefid or trifid; stem leafy, panicled; petals roundish; root-leaves numerous, in tufts, from the centre of which the stem arises.—This beautiful plant was found on the rocks of Cwm Idwell, above Llyn Idwell, near Twelldû in North Wales. It flowers from April to June.

48. Saxifraga Tricuspidata. Root-leaves aggregate, wedge-shaped, ciliate, acutely three-toothed; stem ascending, racemose; petals lanceolate, three times as long as the calix.—Native of Greenland.

49. Saxifraga Rivularis. Plant erect; leaves palmated, petiolate; the highest leaf spatulate; stem with few flowers; root fibrous; germen semi-inferior; flowers white, small.—Grows in Labrador.

***** Leaves lobed; Stems procumbent.*

50. Saxifraga Cymbalaria. Stem-leaves cordate, three-lobed, and entire; stems procumbent.—Native of the Levant, found on Mount Ararat.

51. Saxifraga Hederacea; *Ivy-leaved Saxifrage.* Stem-leaves ovate, lobed; stem filiform, flaccid. Annual, flowering in July.—Native of the Levant.

52. Saxifraga Orientalis. Leaves roundish, five-lobed;

stem very much branched, procumbent.—Native of the Levant.

53. Saxifraga Cuneata. Lower leaves petioled, wedge-shaped, five-lobed; stem-leaves sessile, lanceolate; stem ascending, panicled; corolla white.—Native of Spain, in the mountains near Castelforte.

54. Saxifraga Hypnoides; *Mossy Saxifrage*, or *Ladies' Cushion*. Leaves linear, entire, or trifid; runners procumbent; stem almost naked; petals elliptic-oblong.—This is a native of Britain, Denmark, Switzerland, Austria, and France. Tufts of it often clothe rocks, where the inequalities are filled with black turfy earth, on the mountains of Wales, Scotland, and the north of England; as on Snowden, on Ben Lomond, and on Arthur's seat near Edinburgh; on the mountains of Westmoreland, Yorkshire, and at Malham and Settle; in Dove-dale and Middleton-dale in Derbyshire; and on Chedder rocks, Somersetshire; flowering in May, and often again sparingly in July and August. This species propagates fast enough by its trailing branches, provided it be planted in a moist soil and a shady situation; but it will not thrive on dry ground, or where it is much exposed to the sun. The best time to remove it, or any of the species, is in autumn, that they may have the benefit of the winter's rain, to establish them well before the dry weather of the spring comes on.

55. Saxifraga Globulifera. Stem bulbiferous; leaves nerved, the lower ones spathulate, quite entire, the upper ones palmate, three or five cleft, in the flowering branch remote, linear. This is hardly distinct from the foregoing species.—Found upon the top of Mount Atlas. It flowers very early in the spring.

56. Saxifraga Spathulata. Leaves spatulate, obtuse, ciliate, undivided; stem prostrate; pedicels axillary, one-flowered.—It flowers very early in the spring, and is found on the summit of Mount Atlas near Belide.

Saxifrage, Golden. See *Chrysosplenium*.

Scabiosa; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* common perianth many-flowered, spreading, many-leaved; leaflets in various rows surrounding the receptacle, and placed upon it, the inner ones gradually less; proper perianth double, both superior; outer shorter, membranaceous, plaited, permanent; inner five-parted, with the segments subulate capillaceous. *Corolla:* universal equal, though often composed of unequal florets; partial one-petalled, tubular, four or five cleft, equal or unequal. *Stamina:* filamenta four, subulate-capillary, weak; antheræ oblong, incumbent. *Pistil:* germen inferior, involved in a proper sheath as in a calicle; style filiform, length of the corolla; stigma obtuse, obliquely emarginate. *Pericarp:* none. *Seeds:* solitary, ovate-oblong, involute, crowned variously with partial calices. *Receptacle:* common convex, chaffy, or naked. *Observe.* The exterior corollets are often larger and more unequal. The crowns of the seeds vary in different species. The primary distinction of the species is to be taken from the division of the florets into four-cleft and five-cleft. Essential Character. *Calix:* common many-leaved; proper double, superior. *Receptacle:* chaffy, or naked. *Seed:* coated and crowned by the partial calix.——The species are forty-three; none of them natives of America.

* *With four-cleft Corollets.*

1. Scabiosa Alpina; *Alpine Scabious.* Corollets four-cleft, equal; calices imbricate; flowers drooping; leaves pinnate; leaflets lanceolate, serrate. Root perennial, composed of many strong fibres, which run deep in the ground; stems several, strong, channelled, upwards of four feet high.—Native of the alps of Switzerland, Dauphiny, and Italy; and is a hardy perennial in our gardens, flowering in June and July. It is a coarse inelegant plant, and is fit only for the borders of a shrubbery. It may be propagated either by seeds or by parting the roots; and should be planted in a loamy soil.

2. Scabiosa Ustulata. Corollets four-cleft, equal; scales of the calix acute; leaves lyrate, toothed.—Native of the Cape.

3. Scabiosa Rigida; *Rigid-leaved Scabious.* Corollets four-cleft, subradiant; calices imbricate, obtuse; leaves lanceolate, serrate, eared; stem suffruticose, rugged.—Native of the Cape.

4. Scabiosa Attenuata; *Narrow-leaved Scabious.* Corollets four-cleft, equal; calices imbricate; scales oblong, obtuse; leaves linear, smooth, entire, and pinnatifid at the base. It flowers from July to September.—Native of the Cape.

5. Scabiosa Scabra; *Rugged-leaved Scabious.* Corollets four-cleft, equal; scales of the calix obtuse; leaves bipinnatifid, rugged, rigid.—Native of the Cape.

6. Scabiosa Transylvanica; *Transylvanian Scabious.* Corollets four-cleft, unequal; calices and chaffs awned; root-leaves lyrate; stem-leaves pinnatifid; flowers small, of a pale purple colour. Annual; and a native of Transylvania.—Sow the seeds in a shady moist border; keep the ground clean, and allow the plants room to spread.

7. Scabiosa Syriaca; *Syrian Scabious.* Corollets four-cleft, equal; calices imbricate, and chaffs awned; stem dichotomous; leaves lanceolate.—Native of Syria. Annual.

8. Scabiosa Leucantha; *Snowy Scabious.* Corollets four-cleft, almost equal; calicine scales ovate, imbricate; leaves pinnatifid. Root perennial; stem stiff, two feet high.—Native of the south of France, and Piedmont.

9. Scabiosa Succisa; *Devil's-bit Scabious.* Corollets four-cleft, equal; stem-leaves toothed; flowers subglobular. Root perennial, oblong, blackish, nearly the thickness of the little finger, often growing obliquely, stumped at the lower end, so as to appear as if bitten off; for in the days of superstition it was fabled that the devil, envying the good that this herb might do to mankind, bit away part of the root. Stem about a foot high, round, leafy, purplish, bearing three or more flowers of a violet purple, often white, very rarely blue.—A strong decoction of the plant taken internally, and continued for a considerable length of time, was (and still continues) a favourite nostrum with many for venereal diseases: the decoction of the leaves is good in coughs, and other disorders of the lungs. The root dried and taken in powder, causes sweat, and is a good medicine in fevers. Linneus observes, that the dry leaves are used to dye wool green. This plant varies much: according to Haller, the flowers are sometimes proliferous, and the leaves are sometimes gashed: the flowers also not only vary in colour, but are also double. In England the plant is commonly hirsute, but it is often described as smooth by foreign authors.—Native of Europe, found principally in pastures, flowering from August to the end of October.

10. Scabiosa Integrifolia; *Red-flowered Annual Scabious.* Corollets four-cleft, radiant; leaves undivided; root-leaves ovate, serrate; branch-leaves lanceolate. Stem herbaceous; root annual. It flowers from June to August.—Native of Germany, Switzerland, the south of France, &c.

11. Scabiosa Amplexicaulis; *Blue-flowered Annual Scabious.* Corollets four-cleft, radiant; leaves embracing, lanceolate, quite entire; root-leaves trifid, crenate.—Native country unknown.

12. Scabiosa Humilis; *Humble Scabious.* Corollets four-cleft, unequal; scales of the calix obtuse; leaves linear, tooth-pinnatifid.—Native of the Cape.

13. Scabiosa Decurrens; *Decurrent-leaved Scabious.* Corollets four-cleft, unequal; scales of the calix ovate; leaves pinnatifid, with the pinnas decurrent.—Native of the Cape.

14. Scabiosa Tatarica; *Giant's Scabious.* Corollets four-cleft, radiant; stem hispid; leaves lanceolate, pinnatifid; lobes subimbricate; root biennial; flowers yellow.—Native of Tartary, and perhaps of Italy.

15. Scabiosa Arvensis; *Field Scabious.* Corollets four-cleft, radiant; leaves pinnatifid, gashed; stem hispid. Root perennial, long, spindle-shaped, mostly branched, running deep into the ground; plant three or four feet high, hairy; flowers large and handsome, the large radiating marginal florets purplish-blue, the rest pale reddish: if held over a lighted pipe of tobacco, in a few minutes they become of a bright green colour. It varies much in the divisions of the leaves, which are sometimes all entire; the whole plant is occasionally smooth, and occurs with white flowers. It is bitter, of a slightly astringent saponaceous quality, and excellent against disorders of the breast, such as coughs, asthmatic affections, difficulty of breathing, &c. for which purposes an infusion of the leaves is the best preparation. The flowers are said to be of a cordial sudorific nature, and good against feverish complaints; the juice applied externally is good against foulnesses and discolourings of the skin. In corn-fields it is a troublesome weed; but in grass, being a hardy plant, and producing a large quantity of foliage, which is eaten by cattle, horses, and sheep, it may be probably be found useful. It flowers in July and August.—Native of the pastures and corn-fields of Europe.

16. Scabiosa Parviflora; *Small-flowered Scabious.* Corollets four-cleft, almost equal, in ovate heads; interior proper calix very short; lower leaves obovate, crenate; stem dichotomous.—Native of Algiers and Sicily.

17. Scabiosa Uralensis; *Uralian Scabious.* Corollets four-cleft, radiant; root-leaves simple; stem-leaves decussively pinnate; chaffs dry, reflexed at the tip.—Annual; and a native of Siberia.

18. Scabiosa Sylvatica; *Broad-leaved Scabious.* Corollets four-cleft, radiant; all the leaves undivided, ovate, oblong, serrate; stem hispid; root perennial. This plant varies much. It flowers during the greatest part of summer.—Native of Germany, Switzerland, Austria, Carniola, and Piedmont, in woods among bushes, and sometimes in fields.

** *With five-cleft Corollas.*

19. Scabiosa Gramuntia; *Cut-leaved Scabious.* Corollets five-cleft; calices very short; stem-leaves bipinnate, filiform.—Native of the south of France, Barbary, &c.

20. Scabiosa Columbaria; *Small Scabious.* Corollets five-cleft, radiant; root-leaves ovate or lyrate, crenate; stem-leaves pinnatifid; segments linear. This is easily distinguished from the other British species, by its five-cleft corollas, and by being also much more radiant than they, that is, having the outer segment of the corollets much larger than the inner: root perennial, tapering to a point. It flowers from June to September.—Found in most parts of Europe, Barbary, and Siberia, on hilly pastures in a gravelly or calcareous soil.

21. Scabiosa Pyrenaica; *Pyrenean Scabious.* Corollets four-cleft, radiant; leaves tomentose, entire, toothed, and pinnatifid; stem one-flowered; flower single, radiate, purple, with the scales of the calix ovate-lanceolate, not longer than the flower.—Native of the Pyrenees, Switzerland, Savoy, Lombardy, and Barbary.

22. Scabiosa Sicula; *Sicilian Scabious.* Corollets five-cleft, equal, shorter than the calix; leaves lyrate, pinnatifid; root annual; stem herbaceous, a foot high, dichotomous, divaricating, red, weak.—Native of Sicily.

23. Scabiosa Rutæfolia; *Rue-leaved Scabious.* Corollets five-cleft; leaves pinnate, the upper ones linear; calices one-leafed, five-cleft; root perennial, woody, divided at top; stems several, erect, a foot high, stiff.—Found in the kingdom of Tunis, flowering in the middle of July.

24. Scabiosa Maritima; *Sea Scabious.* Corollets five-cleft, radiant, shorter than the calix; leaves pinnate, the upper ones linear, quite entire; stem upright, branched, round, striated, villose, a foot and half high. Annual.—Native of Italy, France, and Japan,

25. Scabiosa Stellata; *Starry Scabious.* Corollets five-cleft, radiant; leaves cut; receptacles of the flowers roundish. There is a variety with the flowers scarcely radiate. It flowers in July and August.—Native of Spain and Barbary. This is a common hardy annual in our gardens, and is raised more for the sake of its heads of seeds, than its large cream-coloured flowers, the heads serving to decorate flower-pots in winter. Sow the seeds in a bed of light loamy earth, where the plants are to remain: when they come up, thin them, and keep them clean from weeds.

26. Scabiosa Prolifera; *Prolific Scabious.* Corollets five-cleft, radiant; flowers subsessile; stem proliferous; leaves undivided.—It is an annual plant; found in the corn-fields of Barbary and Egypt.

27. Scabiosa Atro-purpurea; *Sweet Scabious.* Corollets five-cleft, radiant; leaves cut; receptacles of the flowers subsessile. The flowers are very sweet, and vary greatly in their colour, some being of a purple approaching to black, others of a pale purple, some red, and others variegated. It also varies in the leaves, some being finer cut than others; and sometimes from the side of the calix come out many slender peduncles sustaining small flowers, like the Proliferous or Hen-and-chicken Daisy. It is a biennial plant; native country not certainly known. The seeds were received first from Italy, under the name of the *Indian Scabious:* but in all probability it is a native of the south of Europe.—Sow the seeds at the end of May, or the beginning of June, upon a shady border of fresh earth; for if they are too much exposed to the sun, and the season should be dry, few of them will grow; and if they are sown early in the spring, they will flower in the autumn, and the winter coming on will prevent the seeds from ripening; besides which, the flowers will be few and weak. Whereas, if they are left to form a strong root and leaves in the autumn, they will send up their flower-stems early in the next summer, branching out on every side, producing a great number of flowers, continuing in succession from June to September, and producing good seeds in plenty. When the plants sown in May come up, transplant them into a bed or border of fresh earth, watering and shading them till they have taken root; and having kept them clean from weeds, transplant them at Michaelmas into the middle of the borders in the pleasure-garden. It is very hardy, being rarely injured by cold, unless it shoots up to flower before winter. It dies after the seeds are ripe.

28. Scabiosa Argentea; *Silvery Scabious.* Corollets five-cleft, radiant, entire; leaves pinnatifid, acute, hairy. This is a low perennial plant, with a branching stalk spreading wide on every side: the leaves are of a silvery colour; the flowers are small, pale, and have no scent. It flowers from June to October.—Native of the Levant.

29. Scabiosa Daucoides; *Carrot-like Scabious.* Corollets five-cleft, radiant; leaves bipinnate; common calix villose, pinnatifid.—Native of Algiers.

30. Scabiosa Indurata. Corollets five-cleft, radiant; leaves ovate, lanceolate, gnawn-toothed at the base; stem rigid.—Native of Africa.

31. Scabiosa Africana; *African Scabious.* Corollets five-cleft, equal; leaves simple, gashed; stem shrubby; peduncle terminating, sustaining one pale flesh-coloured scentless flower. It varies in the leaves.—Native of Africa, flowering from July to October. This, with the other African species, may be increased by cuttings planted in a shady border during any of the summer months. When these have put out good roots, plant them in pots filled with light loamy earth, and placed in the shade till they have taken new root; then remove them to a sheltered situation till the frosts come on, when they must be put into the dry-stove or a glass-case for the winter, giving them as much free air as possible in dry weather. In the middle or end of April remove them into the open air in a warm situation.

32. Scabiosa Monspeliensis; *Montpellier Scabious.* Corollets five-cleft, equal, shorter than the calix, all the leaves pinnate, ciliate; plant a foot and half high.—Native of France, about Montpellier.

33. Scabiosa Pumila; *Dwarf Scabious.* Corollets five-cleft, radiant, almost stemless; leaves very hairy; root-leaves lyrate; stem-leaves pinnate, gashed.—Native of the Cape.

34. Scabiosa Cretica; *Cretan Scabious.* Corollets five-cleft, radiant; leaves lanceolate, almost quite entire; stem shrubby. The flowers stand upon very long naked peduncles, at the end of the branches, and are of a fine blue colour.—Native of Candia and Sicily. This may be increased by cuttings, or by slips. When these have taken good root, plant some on a dry border near a south wall, where they will live in common winters: but as severe frost frequently destroys them, put others in pots, placing them under a frame in winter, and giving them air in mild weather.

35. Scabiosa Limonifolia. Corollets five, equal; leaves wedge-shaped, quite entire, wrinkled and hoary underneath; root divided above; stems frutescent at the base, erect, simple.—Native of Sicily.

36. Scabiosa Graminifolia; *Grass-leaved Scabious.* Corollets five-cleft, radiant; leaves linear-lanceolate, quite entire; stem herbaceous; root perennial. The stem is branching at the base, procumbent, and knobbed. It flowers in July.—Native of the mountains of Dauphiny, Carniola, Italy, Switzerland, Silesia, and Barbary. It does not produce seeds in England, but may be propagated by slips, planted on a shady border at the beginning of April. When these have put out good roots, take them up with balls of earth, and transplant them where they are to remain. It loves a soft loamy soil, and a shady situation.

37. Scabiosa Lyrata; *Lyrate-leaved Scabious.* Corollets five-cleft, radiant; segments entire; lower leaves oblong, serrate; upper pinnatifid at the base; stem herbaceous, erect, a foot high, simple, striated, somewhat hairy.—Native of the shore of the Dardanelles.

38. Scabiosa Palestina; *Palestine Scabious.* Corollets five-cleft, radiant, all the segments trifid; leaves undivided, subserrate; upper pinnatifid at the base; stem a foot high, round.—Native of Palestine.

39. Scabiosa Isetensis. Corollets five-cleft, radiant, longer than the calix; leaves bipinnate, linear.—Native of Siberia, on rocks.

40. Scabiosa Ucranica; *Ukraine Scabious.* Corollets five-cleft, radiant; root-leaves pinnatifid; stem-leaves linear-lanceolate at the base.—Native of the Ukraine; and said to be found in Piedmont.

41. Scabiosa Ochroleuca; *Pale Scabious.* Corollets five-cleft, radiant; leaves bipinnate, linear; root perennial, whitish brown, the thickness of a finger, and woody. It flowers in July and August.—Native of Germany.

42. Scabiosa Papposa; *Downy-headed Scabious.* Corollets five-cleft, unequal; stem herbaceous, erect; leaves pinnatifid; seeds awned and feather-downed; root annual.—It flowers in July; and is a native of the island of Crete or Candia, and of the south of Europe.

43. Scabiosa Pterocephala; *Wing-headed Scabious.* Corollets five-cleft; stem procumbent, shrubby; leaves laciniate, hirsute, down-feathered.—Supposed to be a native of Greece.

Scabious, Sheep's. See *Jasione.*

Scævola; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth superior, very short, five-cleft, permanent. *Corolla:* one-petalled, unequal; tube long, with a longitudinal fissure; border five-cleft, ascending; segments directed one way, lanceolate, membranaceous at the edge. *Stamina:* filamenta five, short, capillary, inserted into the receptacle; antheræ distinct, erect, oblong, obtuse. *Pistil:* germen inferior, ovate; style filiform, thicker above, longer than the stamina, issuing from the fissure, curved in towards the border; stigma flatted, obtuse, with the mouth open. *Pericarp:* drupe roundish, umbilicate with a dot, one-celled. *Seed:* nut ovate, wrinkled, acute, two-celled. Essential Character. *Corolla:* one-petalled, with the tube cloven longitudinally, or the border five-cleft and lateral. *Drupe:* inferior, containing one two-celled nut.——The species are,

1. Scævola Lobelia. Leaves obovate, smooth, quite entire; calix undivided, very short; stem suffrutescent, two feet high, almost single, thick, round, smooth. This is a fleshy, inelegant shrub, with rugged branches, leafy at the top; flowers very few together, in axillary, solitary, stalked cymes; corolla yellowish-white; drupe succulent, black.—Native of both Indies, and found growing very generally between the tropics.—It is propagated by the seeds, which must be imported from the countries where it naturally grows, as the plant will not produce them in Europe. Sow them in pots filled with light sandy earth, and plunged into a hot-bed of tanners' bark, where the plants will come up in about a month or five weeks, provided the bed be warm, and the earth often watered. When the plants are up, they should be kept in a temperate hot-bed, and frequently refreshed with water, but it must not be given to them in large quantities, for they are very succulent, and subject to perish with much moisture, especially while they are young. When the plants are about two inches high, they should be carefully taken out of the pots in which they were sown, and each planted in a separate small pot filled with fresh light sandy earth, and then plunged into the hot-bed again, observing to shade them in the heat of the day until they have taken new root. In this hot-bed the plants may remain until the middle or latter end of September, when they must be removed into the stove, and plunged into the tan-bed, in the warmest part of the stove; for they are very tender plants while young, and must therefore be kept very warm, otherwise they will not live through the first winter in this country. In the spring following, the plants may be shifted into somewhat larger pots, and then plunged into a fresh hot-bed to forward their growth; for if they are not pushed on while they are young, they seldom grow to any size, nor will they ever flower; so that in order to have them in any beauty, they must be carefully managed. The leaves of this plant are very subject to contract filth, by being constantly kept in the stove, therefore they should be washed with a sponge frequently, to keep them clean, otherwise they will appear unsightly.

2. Scævola Kœnigii. Leaves obovate, smooth; tooth subrepand at top; calix five-toothed.—Native of the East Indies. To be treated like the preceding.

3. Scævola Sericea. Leaves obovate, villose, very soft, toothed at top; branches brown, villose, muricated with the remains of fallen leaves.—Native of Botany Island, New Caledonia.——Three other species, natives of New Holland, have been discovered.

Scallion. See *Allium.*

Scammony. See *Convolvulus.*

Scandix; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* umbel universal long, with few rays; partial more abundant. *Involucre:* universal none; partial five-leaved, length of the umbellet. *Perianth:* proper obsolete. *Corolla:* universal difform, radiate; florets of the disk abortive; partial, petals five, inflex, emarginate; the inner ones smaller, outmost larger. *Stamina:* filamenta five, capillary; antheræ roundish. *Pistil:* germen oblong, inferior; styles two, awl-shaped, length of the least petal, distant, permanent; stigmas in the radiant florets obtuse. *Pericarp:* fruit very long, awl-shaped, bipartite. *Seeds:* two, awl-shaped, convex and grooved on one side, flat on the other. *Observe.* The florets of the disk are abortive in some species; the involucres vary in the number of leaves. The first species has angular seeds, and a caducous involucre. The second species has the seeds filiform, hiding the nucleus at the base. The fourth species has ovate subulate striated seeds, a green permanent involucre, and all the florets hermaphrodite. Gærtner observes, that in the true Scandix the nucleus is scarcely a fourth part of the length of the seed; but in the fourth species is three-fourths, and in the first the full length of the seed. Essential Character. *Florets,* of the disk; most commonly male. *Corolla:* radiate. *Petals:* emarginate. *Fruit:* awl-shaped.——The species are,

1. Scandix Odorata; *Sweet Cicely,* or *Great Chervil.* Seeds grooved, angular. Root perennial, very thick, branched, of a sweet aromatic taste like Aniseed; stems three or four feet high, hairy, and fistulous; leaves large, branching, somewhat like those of Fern, whence it has been called *Swell Fern;* flowers white, with a sweet aromatic scent. This is one of the old medicinal plants. The young leaves were put into salads; and the roots were boiled, and eaten cold or in tarts, and in a variety of sauces. The Germans still use it in soups; and, in the north of England, the seeds, which have the taste and scent of Aniseed, are employed in polishing and perfuming oak floors and furniture.—Native of Germany, Switzerland, Austria, the south of France, and the north part of Italy. It is found in England near houses, in Westmoreland, Cumberland, and Lancashire; growing wild near Leeds, in Yorkshire; on the banks of the Derwent, above Chatsworth; near Shelsleywalsh, Worcestershire; at White Ladies, near Boscobel, Shropshire; at Tixall, near Stafford; in Rose Lane, Oxfordshire; in Wales, at Llangollen monastery, Denbighshire; and in the waste places and orchards, but always near houses, in the lowlands of Scotland. This, with the second, fifth, sixth, tenth, and eleventh species, increases fast by seed, which, if permitted to scatter, will produce plenty of plants; these may be left in their place, or transplanted to any part of the garden, for they will grow in any soil or situation, and require no care.

2. Scandix Pecten Veneris; *Needle Chervil, Shepherd's Needle,* or *Venus's Comb.* Seeds with very long, and somewhat rugged beaks; leaflets linear, multifid. Root annual, small; stem from six inches to a foot in height, branched; flowers pure white. It may be easily known by its fine cut leaves, its singular large cloven involucres, and particularly by the beaks to the seeds, which are two inches in length, and so much resemble those of Crane's Bill, that it might be mistaken at first sight for one of that genus. These beaks have given rise to the names *Venus's Comb* and *Shepherd's Needle;* in Yorkshire it is called *Crake Needle.* It is of the same genus with Chervil, and, having something of the same smell and taste, might perhaps be put to the same use: the Greeks appear to use it as an ordinary pot-herb. This species is a very common weed among corn; and though a small annual plant, it sometimes multiplies in such abundance, as to be injurious to the crop. It flowers in June, and the seeds ripen before harvest.—Native of Europe.

3. Scandix Chilensis; *Chili Chervil.* Seeds with very long beaks; leaflets entire, ovate-lanceolate.—Native of Chili.

4. Scandix Cerefolium; *Garden Chervil.* Seeds shining, ovate, subulate; umbels sessile, lateral. Root annual; leaves of an exceedingly delicate texture, smooth, shining, tripinnate. They are frequently used in soup, especially by the Dutch; but whoever uses it, should be cautious not to mistake the next species (the leaves of which are suspected of being poisonous) for this plant. It is grateful to the palate and stomach, slightly aromatic, and gently aperient and diuretic. Geoffrey remarks, that he found it of remarkable service in the dropsy; that it acts mildly and without irritation; and abates inflammatory symptoms. He observes, that it is to be used with caution, where the patient is troubled with a cough or a spitting of blood, as being liable to aggravate those complaints, in consequence of a nitrous salt, by virtue of which he supposes this juice to act. The extract is manifestly saline, and more pungent than nitre, but does not visibly deflagrate in the fire. Of the aromatic flavour, little or nothing accompanies the juice; though water or spirit extracts the greater part of it by infusion. The aromatic part is very volatile; in distillation with water, there separates a small portion of essential oil, resembling in taste that of Fennel seeds. Haller, who treats copiously on the medicinal qualities of this plant, has no opinion of it in the dropsy; but thinks it may be of service in obstructions of the bowels, in external hæmorrhoids, and a stoppage of urine. It was much more cultivated in England formerly than at present: it is, we know not why, seldom used by regular practitioners, and has almost disappeared from our kitchens and tables. It is found flowering in May, in many parts of Europe.—Native of cultivated ground in the south of Europe. To propagate it, sow the seeds in autumn, soon after they are cast, either in drills or broad-cast: sowing in the spring will not answer, for the plants will rarely come up, and then are sure to wither and decay upon the approach of warm weather; while the plants which rise in the autumn continue green all the winter, and flower in the April following, soon after which they ripen their seeds and decay. This species will continue itself by its scattered seeds.

5. Scandix Anthriscus; *Rough* or *Hemlock Chervil.* Seeds ovate, hispid; corollas uniform; stem even. Root annual; leaves tripinnate, soft, and tender, hairy, especially underneath, and along the midrib of a yellowish green colour; leaflets ovate, lobed. This dangerous plant may be easily distinguished from the rest of the genus, by its want of that pleasant smell, which all the others afford when rubbed; and by its having, instead, a strong hircine smell like Hemlock. The danger arises from its habit approaching nearly to that of the true Chervil: but not only is the smell different, but the seeds of the true are black, smooth, and glossy, longer, and narrower, with two blunt ridges; while those of this suspected plant are dark brown, ovate or lanceolate, with stiff hairs or prickles, curved upwards on the convex side, and with a very short smooth beak. Mr. Miller remarks, that there have been some instances of the ill effects of this plant when taken inwardly; but no other author appears to have confirmed this account, which is nevertheless entitled to

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Peruvian Mastick Tree.

STYRAX OFFICINALE.
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great respect, especially when the remarkable difference between its smell and that of its congeners is considered; and caution at least is necessary, as this plant is common by our way-sides, on banks, in hedges, and under walls, flowering in May and June.

6. Scandix Australis; *Radiated Chervil.* Seeds awl-shaped, hispid; flowers radiate; stems even; leaves thinly placed, very narrow, and finely cut.—Native of the south of France, Italy, and Candia.

7. Scandix Nodosa; *Knobbed Chervil.* Seeds subcylindrical, hispid; stem hispid; joints swelling. Root annual; flowers white.—Native of Sicily.

8. Scandix Trichosperma; *Hairy-seeded Chervil.* Seeds extremely hirsute, with hairs double the length of the seed; root annual.—Native of Egypt.

9. Scandix Latifolia; *Broad-leaved Chervil.* Seeds elliptical, hispid; leaves twice ternate, ovate, cut; their sheaths, as well as the stem, smooth. Flowers small, white; fruit about half an inch long, very rough, not beaked.—Native of Crete, Cyprus, &c. in marshy places.

10. Scandix Grandiflora; *Great-flowered Chervil.* Seeds shorter than the villose peduncle. Annual; with fine cut leaves.—Native of the Levant.

11. Scandix Procumbens; *Trailing Chervil.* Seeds shining, ovate-subulate; leaves decompound.—This low, trailing, annual plant, is a native of Virginia.

Scarlet Bean. See *Phaseolus.*

Scarlet Cardinal-flower. See *Lobelia Cardinalis.*

Scarlet Convolvulus. See *Ipomæa.*

Scarlet Horse Chesnut. See *Pavia.*

Scarlet Jasmin. See *Bignonia.*

Scarlet Lupin. See *Lathyrus.*

Scarlet Oak. See *Quercus.*

Schæfferia; a genus of the class Diœcia, order Tetrandria.—Generic Character. *Male. Calix:* perianth four or five leaved; leaflets ovate, concave, spreading. *Corolla:* petals four, lanceolate-ovate, spreading; or instead of these a four-cornered convex nectary, in the middle of the flower. *Stamina:* filamenta four, filiform, erect; antheræ roundish, erect. *Pistil:* rudimentum of a germen, without style or stigma. *Female. Calix:* perianth one-leafed, four or five parted, inferior; segments obtuse, spreading. *Corolla:* petals four, lanceolate-ovate, concave, wider at the end, spreading, deciduous; or, in place of these, a nectary, which is a fleshy rim about the germen. *Pistil:* germen roundish; styles two, very short, reflexed; stigmas bifid or entire, compressed into a sort of head. *Pericarp:* berry roundish, two-celled. *Seeds:* solitary, hemispherical. Essential Character. *Male. Calix:* four or five leaved. *Corolla:* four-petalled or none. *Female. Calix:* four or five parted. *Corolla:* four-parted or none. *Berry:* two-celled. *Seeds:* solitary. ——The species are,

1. Schæfferia Completa. Flowers four-petalled, axillary. A small tree or shrub, with an erect trunk, and smooth ash-coloured bark; leaves on short petioles, alternately smaller, ovate, acute, almost entire, or very slightly crenate, veined, rigid, with the end recurved a little, green, shining; berries the size of a small pea, yellowish-red.—Grows in the W. Indies.

2. Schæfferia Lateriflora. Flowers lateral, apetalous. This small tree has a trunk six feet high.—Native of Hispaniola.

Schefflera; a genus of the class Pentandria, order Decagynia.—Generic Character. *Calix:* perianth very small, five-toothed, superior, permanent; segments awl-shaped. *Corolla:* petals five, oblong. *Stamina:* filamenta five, filiform, scarcely longer than the petals; antheræ roundish. *Pistil:* germen globular, depressed, inferior; styles eight or ten, round, short, permanent; stigmas simple. *Pericarp:* capsule globular, depressed, eight or ten celled. *Seeds:* solitary, semicircular, compressed. Essential Character. *Calix:* five-toothed. *Corolla:* five-petalled. *Capsule:* eight or ten celled. *Seeds:* solitary, semicircular.——The only known species is,

1. Schefflera Digitata.—Native of New Zealand.

Scheuchzeria; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* perianth six-parted; leaflets oblong, acute, reflex, spreading, rude, permanent. *Corolla:* none. *Stamina:* filamenta six, capillary, very short, flaccid; antheræ erect, obtuse, very long, compressed. *Pistil:* germina three, ovate, compressed, size of the calix; styles none; stigmas three, oblong, blunt at top, fastened outwardly to the germen. *Pericarp:* capsules as many as there are germina, roundish, compressed, inflated, reflex, distant, two-valved. *Seeds:* solitary, oblong. *Observe.* The number of germina and capsules varies from three to six; but three is the most natural number. Essential Character. *Calix:* six-parted. *Corolla:* none. *Styles:* none. *Capsule:* three, inflated, one-seeded.——The only species yet discovered is,

1. Scheuchzeria Palustris. Root-leaves few; stem-leaves two, one involving the base of the stem with its sheath, the other a little higher, each shorter than the stem; flowers from each axil of the floral leaves solitary, on upright peduncles of a yellowish green colour; root perennial, creeping, jointed; stem upright, simple, a span high, round.—Native of Lapland, Sweden, Denmark, Germany, Switzerland, Prussia, Dauphiny, Siberia, and North America, in marshes.

Schinus; a genus of the class Diœcia, order Decandria.—Generic Character. *Male. Calix:* perianth one-leafed, five-parted, spreading, acute. *Corolla:* petals five, oval, spreading, petioled. *Stamina:* filamenta ten, filiform, length of the corolla, spreading; antheræ roundish. *Pistil:* rudimentum of a germen without a stigma. *Female. Calix:* perianth one-leafed, five-parted, acute, permanent. *Corolla:* petals five, oblong, spreading, petioled. *Pistil:* germen roundish; style none; stigmas three, ovate. *Pericarp:* berry globular, three-celled. *Seeds:* solitary, globular. Essential Character. *Male. Calix:* five-parted. *Petals:* five. *Female. Berry:* three-celled.——The species are,

1. Schinus Molle; *Peruvian Mastick Tree.* Leaves pinnate; leaflets serrate, with the end one very long; petioles equal. Stem woody, eight or ten feet high, dividing into many branches, covered with a brown rough bark. The flowers are produced in loose bunches, at the end of the branches; they are very small and white, and have no odour. The berries are about the size of a pea, of a beautiful opaline rose-colour, shining. A resinous gum exudes from the stem when wounded, which partakes of the nature of Mastick.—Native of dry sandy places in Peru.—This plant is propagated best by seeds, which must be procured from its native country. Sow these seeds in pots, filled with fresh earth, and plunged into a moderate hot-bed. If the seeds are good, the plants will appear in about five or six weeks, and if air be admitted to them daily, according to the warmth of the season, and water be duly given, they will be fit to transplant in about five or six weeks; and should then be carefully turned out of the pots, and their roots separated, in order to replant them each in a small pot, filled with soft loamy earth, and plunged again into a moderate hot-bed, shading them from the sun till they have taken fresh root. They must then be gradually inured to the open air, but must be removed into shelter before the first frosts, otherwise their tops will be all killed, and the plants themselves often destroyed. When young, they require a little warmth in winter; but after

two or three years' growth, they will live in a green-house; where they will form a good variety, retaining their leaves all the year. They may also be increased by layers and cuttings: the layers should be put down in the spring, and by the following spring they will be rooted; the cuttings should be planted in April, which will put out roots in about two months, and may afterwards be treated as the seedling plants.

2. Schinus Areira; *Brasilian Mastick Tree.* Leaves pinnate; leaflets quite entire, equal, petioles equal.—Native of Brazil and Peru. This may be propagated in the same manner as the first species, but the young plants being much more tender, will require to be placed in a moderate stove for four or five winters, after which they may be placed in a good green-house, and sparingly watered.

Schisandra; a genus of the class Monœcia, order Pentandria. ESSENTIAL CHARACTER. *Calix:* nine-leaved, disposed in three series. *Corolla:* none. *Antheræ:* subsessile, covering at the points. *Berry:* single-seeded, inserted upon an elongated filiform receptacle.——There is but one species,

Schisandra Coccinea. A twining shrub, with alternate and lanceolate leaves, sometimes repandly denticulate; flowers axillary, solitary, scarlet; acini spiked.—Grows in Carolina and Georgia.

Schmidelia; a genus of the class Octandria, order Digynia. —GENERIC CHARACTER. *Calix:* perianth two-leaved; leaflets roundish, coloured, permanent. *Corolla:* petals four, roundish, sessile, erect. *Stamina:* filamenta eight, simple, length of the flower; antheræ roundish. *Pistil:* germina two, pedicelled, compressed, longer than the flower; styles filiform, bifid at the top; stigmas simple. *Pericarp:* berries two, subglobular. *Seeds:* solitary. ESSENTIAL CHARACTER. *Calix:* two-leaved. *Corolla:* four-petalled. *Germina:* pedicelled, longer than the flower.——The only known species is,

1. Schmidelia Racemosa. Stem arboreous; branches round, leafy, finely downy; leaves alternate, ternate; leaflets petioled, obovate-oblong, acuminate.—Native of Java.

Schœnus; a genus of the class Triandria, order Monogynia. —GENERIC CHARACTER. *Calix:* glumes chaffy, one-valved, heaped. *Corolla:* none. *Stamina:* filamenta three, capillary; antheræ oblong, erect. *Pistil:* germen ovate, three-sided, obtuse; style bristle-shaped, length of the glume; stigma bifid or trifid, slender. *Pericarp:* none. *Seed:* single, roundish, among the glumes. *Observe.* There are some species in which a very few small bristles, springing from the proper receptacle, surround the seed. ESSENTIAL CHARACTER. *Glumes:* chaffy, one-valved, heaped, the outer ones barren. *Corolla:* none. *Seed:* one, roundish, among the glumes. ——The species are,

* *With a round Culm.*

1. Schœnus Mariscus; *Prickly* or *Long-rooted Bog Rush.* Culm round; leaves prickly along the edge and back; root perennial. So common in the Isle of Ely, that it is brought up to Cambridge for lighting fires and heating ovens. In the Fen towns, it is frequently used instead of straw, for thatching; and in pools often grows in such quantities, as to form floating islands.—It is found in bogs all over England, and in the fens and ditches of Europe and Africa.

2. Schœnus Junceus; *Rushy Bog Rush.* Culm round, almost naked; umbel sessile, lateral.—Native of Guinea.

3. Schœnus Mucronatus; *Dagger-pointed* or *Clustered Bog Rush.* Culm round, naked; spikelets ovate, in bundles; involucre six-leaved; leaves channelled; root perennial, creeping.—Native of the south of France, Spain, Italy, Barbary, and the Levant, on sandy sea-coasts.

4. Schœnus Pilosus; *Hairy Bog Rush.* Culm round; sheaths of the leaves hairy; flowers in bundles.—Native of Guinea.

5. Schœnus Filiformis; *Slender-stalked Bog Rush.* Culm round, capillary; head oblong; involucre three-leaved.—Native of the Cape.

6. Schœnus Striatus; *Striated Bog Rush.* Culm round; head ovate; involucre three-leaved.—Native of the Cape.

7. Schœnus Capitellum. Culm round; head ovate; involucre two-leaved.—Native of the Cape.

8. Schœnus Scariosus. Culm round; head oblong; involucre one-leafed; glumes scariose at the edge.—Native of the East Indies and the Cape.

9. Schœnus Nigricans; *Black Bog Rush.* Culm round, naked; head ovate; involucre two-leaved, with one of the valves awl-shaped and longer; root perennial. It flowers in June.—Native of Europe and Barbary, in bogs and marshes; not uncommon in England.

10. Schœnus Compressus; *Compressed Bog Rush.* Culm roundish, naked; spike distich, shorter than the one-leafed involucre; spikelets many-flowered; leaves flat; root perennial, fibrous, a little creeping.—Native of the bogs of Europe. Found on Hinton Moor, between Little Shelford and Whittlesford in Cambridgeshire; near Darsingham Bath, Norfolk; at Basford Scottum in Nottinghamshire. It flowers in July, and is not uncommon in many other parts of England.

11. Schœnus Ferrugineus; *Rust-coloured Bog Rush.* Culm round, naked; spike double; larger valve of the involucre equal to the spike.—Native of Gothland.

12. Schœnus Rufus; *Brown Bog Rush.* Culm round, naked; spike distich, longer than the one-leafed blunt involucre; spikelets few-flowered; leaflets channelled; root perennial, creeping, horizontal.—It flowers in July, and has been observed in the marshes of Scotland, as in the isles of Mull and Skye, and at Douglas Castle.

13. Schœnus Trystachios; *Three-spiked Bog Rush.* Culm round, jointed, even; heads three, terminating.—This, and the seven next species, are natives of the Cape.

14. Schœnus Cuspidatus; *Cusped Bog Rush.* Culm round; spikes panicled, shorter than the involucres.

15. Schœnus Aristatus; *Awned Bog Rush.* Culm round, leafless; spikes aggregate; involucre one-leafed; glumes cusped.

16. Schœnus Compar; *Equal-spiked Bog Rush.* Culm round, leafless; spikes aggregate; involucres one-leafed, shorter; glumes acute.

17. Schœnus Flexuosus; *Flexuose Bog Rush.* Culm round, leafy; spikes panicled; glumes mucronate.

18. Schœnus Capillaceus; *Hairy-leaved Bog Rush.* Culm round, leafy; spikes subracemed; glumes cusped; leaves capillary.

19. Schœnus Ustulatus; *Burnt Bog Rush.* Culm round, leafy; spikes peduncled, pendulous, oblong, awned.

20. Schœnus Spicatus; *Spiked Bog Rush.* Culm round, capillary; heads spiked, involucred.

21. Schœnus Bobartiæ; *Hop-spiked Bog Rush.* Culm compressed; head terminating; involucre five-leaved.—Supposed to be a native of Ceylon.

22. Schœnus Stellatus; *Starry Bog Rush.* Culm subtriquetrous; spikelets conglomerate, with a leafy involucre, coloured at the base; root perennial; plant almost a foot high.—Native of the West Indies.

** *With a three-sided Culm.*

23. Schœnus Cephalotes. Culm leafy, three-sided; involucre four-leaved, bent down; head oblong, terminating.—Native of Surinam.

24. Schœnus Cyperoides. Culm three-sided, leafy; umbel terminating; spikelets glomerate.—Native of Jamaica.

25. Schœnus Cymosus. Culm three-sided, leafy; umbel terminating, compound; spikelets ovate, striated, glomerate. —Native of North America.

26. Schœnus Glomeratus; *Cluster-headed Bog Rush.* Culm three-sided, leafy; flowers in bundles; leaves flat; peduncles lateral, in pairs.—Native of Jamaica and North America.

27. Schœnus Cladium. Culm bluntly three-sided, leafy, even; leaves prickly in front; panicles diffused; spikelets one-flowered, sessile, two-stamined.—Native of the sea-marshes in Jamaica.

28. Schœnus Effusus. Culm leafy, bluntly three-sided, even; leaves prickly in front; panicles more erect; spikelets one-flowered, sessile, two-stamined.—Native of Jamaica, and found also in the sea-marshes of Vera Cruz.

29. Schœnus Restioides. Culms at the bottom compressed, ancipital, and very smooth; flowers panicled; sheath lanceolate at the top. This approaches very near to this genus, but still is so singular, and so different in habit, that it might make a distinct genus if sufficient characters could be found. —Native of the West Indies.

30. Schœnus Surinamensis; *Surinam Bog Rush.* Culm leafy, three-sided; peduncles corymbed, the lower ones alternate, distant, the upper ones crowded.—Native of Jamaica, Surinam, the East Indies, and China.

31. Schœnus Thermalis; *Warm-bath Bog Rush.* Culm three-sided, leafy; heads lateral compound, subsessile; leaves ensiform, keeled.—Native of the Cape.

32. Schœnus Lævis. Culm triangular, leafy; heads lateral; glumes mucronate; spikes ovate.—Native of the Cape.

33. Schœnus Lanceus. Culm three-cornered, leafy; spikes panicled, lateral; glumes and spikelets lanceolate.—Native of the Cape.

34. Schœnus Albus; *White-headed Bog Rush.* Culm three-sided, leafy, very long, filiform; spikes lateral, peduncled; leaves bristle-shaped, channelled; stamens two; seed beaked, with ten bristles at the base. Root perennial, creeping.—Native of the bogs of Europe. Found in England near Gamlingay park in Cambridgeshire; on Ampthill moor, and at Potton and Aspley, in Bedfordshire; in the Felthorpe bogs, and near Haydon in Norfolk; upon Birmingham heath; in the New Forest; upon Bagshot heath; between Wickham and Croydon in Surry; near Tunbridge in Kent; in Cornwall, Lancashire, Cumberland, Westmoreland, and Scotland.

35. Schœnus Gracilis; *Slender Bog Rush.* Culm three-sided, leafy, very long, filiform; spikes lateral, peduncled.— Native of woods on the highest mountains of Jamaica.

36. Schœnus Setaccus; *Brittle-stalked Bog Rush.* Culm three-sided, almost naked; leaves bristle-shaped; spikelets aggregate; flowers two-stamined.—Native of the dry pastures in the West Indies.

37. Schœnus Pusillus; *Dwarf Bog Rush.* Culm three-sided, naked, filiform; spikelets terminating, subfascicled, sessile, with a leaflet beneath equalling the spike.—Found in the southern parts of Jamaica.

38. Schœnus Capillaris. Culm three-sided, naked, capillary; leaves capillary; spikelets fascicled, reflex, involucred; involucret two-leaved. It flowers in spring.—Native of Hispaniola.

Schœpfia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth incrusting the germen at the bottom, turbinate, angular, indistinctly five-toothed. *Corolla:* one-petalled, bell-shaped, ten-grooved at the base, five-cleft; segments triangular, acute, reflexed. *Stamina:* filamenta five, very short; antheræ twin, erect, in the mouth of the corolla. *Pistil:* germen turbinate, half inferior, within the corolla, crowned with a semiglobular, porous gland; style shorter than the corolla, cylindrical, erect; stigma capitate, trifid. *Pericarp:* drupe with three cells, but only one nut. Essential Character. *Calix:* double; outer bifid, inferior; inner superior, quite entire. *Corolla:* bell-shaped. *Stigma:* capitate. *Drupe:* one-seeded. ——The only known species is,

1. Schœpfia Americana. Leaves petioled, alternate, ovate, very smooth, attenuated, blunt, quite entire; peduncles axillary, often in pairs, one-flowered, but sometimes two or three flowered. A small tree, eight or ten feet in height, with round smooth branches.—Native of Santa Cruz and Montserrat.

Schotia; a genus of the class Decandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, coloured, permanent; tube turbinate, subcompressed, fleshy; border half five-cleft; segments ovate, concave, blunt, erect, equal. *Corolla:* petals five, placed on the tube of the calix, oblong, concave, blunt, erect, equal, lying over each other at the sides, sessile, twice as long as the segments of the calix. *Stamina:* filamenta ten, awl-shaped, erect, a little longer than the petals, inserted in a ring into the tube of the calix; antheræ oblong, incumbent. *Pistil:* germen oblong, compressed, pedicelled; style filiform, length of the stamina; stigma simple, blunt. *Pericarp:* legume, pedicelled. *Seeds:* two. Essential Character. *Calix:* tubular, five-cleft. *Petals:* five, inserted into the calix, closed by the sides lying over each other. *Legume:* pedicelled.——The species are,

1. Schotia Speciosa. Leaves pinnate, of from seven to ten pair of oval-lanceolate pointed leaflets; stipules awl-shaped. A tufted evergreen shrub, about three feet high, of handsome growth, with round, rigid, diffused branches; flowers in a cluster, of a bright pink or scarlet colour.—Native of Senegal, and of the Cape. For its culture, see *Guiacum Afrum.*

2. Schotia Tamarindifolia. Leaves pinnate, of from eight to ten pair of oval, rather obtuse leaflets, rather gibbous on the upper side at the base. In habit this species greatly resembles the preceding.—Native of the Cape.

3. Schotia Stipulata. Leaves pinnate, of five pair of oval, acute, pointed leaflets; stipules deeply divided into two segments.—Native of the Cape.

Schradera; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* a superior rim, quite entire, closely surrounding the base of the corolla. *Corolla:* thick, one-petalled; tube half an inch long, gradually widening upwards, within smooth below, hairy above; border five or six parted; segments fleshy, lanceolate, a little reflexed, above towards the throat flat, in front triangular, on the compressed sides keeled, at the base of the keel a triangular fleshy toothlet, beneath flat. *Stamina:* filamenta scarcely any; antheræ five or six, linear, between the segments of the border, three times shorter than the border. *Pistil:* germen inferior, four-cornered at the base, the sides a little pressed in the corners, acute; style one, shorter than the tube of the corolla; stigmas two, thick, oblong. *Pericarp:* berry four-celled. *Seeds:* very many, minute. Essential Character. *Calix:* a superior rim, quite entire. *Corolla:* five or six cleft. *Stigmas:* two. *Berry:* four-celled, many-seeded;—or, according to Willdenow, *Involucre Universal:* many-flowered. *Calix:* superior, pitcher-shaped. *Corolla:* five or six cleft, bell-shaped, hairy at the throat. *Berry:* many-seeded.——The species are,

1. Schradera Capitata. Involucre toothed; calix quite entire; leaves blunt; flowers in heads. This is a climbing parasitical shrub, with square grayish branches.—Native of Montserrat.

2. Schradera Cephalotes. Involucre quite entire; calix toothed; leaves acuminate.—Native of Jamaica.

Schrebera; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* inferior, tubular, somewhat two-lipped, with the lips nearly equal, emarginate, often two lateral toothlets, one on each side, in the divisions of the lips. *Corolla:* one-petalled, salver-form; tube cylindric, three times longer than the calix; border spreading, divided into five, six, or seven, wedge-form truncate segments. *Stamina:* filamenta two, short, inserted below the middle of the tube; antheræ oblong, hid within the tube of the corolla. *Pistil:* germen superior, oval; style a little longer than the tube; stigma bifid. *Pericarp:* capsule pear-shaped, scabrous, two-celled, two-valved. *Seeds:* four in each cell, irregularly oval, compressed, with a long membranaceous wing. Essential Character. *Calix:* two-lipped. *Corolla:* from five to seven cleft. *Capsule:* pear-shaped, two-celled, two-valved. *Seeds:* from eight to ten, membranaceous, winged.— -The only species yet found is,

1. Schrebera Swietenioides. This is a large timber-tree, with an erect trunk, scabrous bark, and numerous branches spreading in every direction, so as to form a large, beautiful, shady head. Leaves nearly opposite, on round smooth petioles, pinnate, with an odd leaflet, about a foot long; flowers white, and variegated, very fragrant during the night; capsule the size of a pullet's egg. The wood is of a gray colour, very close-grained, heavy, and durable: it is reckoned less subject to crack or warp than any other; on which account it is employed by weavers in many parts of their looms, particularly for the beam: it serves also for a great variety of other uses, and would probably answer well for scales to mathematical instruments, being less subject to warp than Box.—Native of Hindoostan, in the valleys of the Rajahmundry circar, flowering in the beginning of the hot season.

Schwalbea; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, ventricose, striated; mouth four-cleft, oblique; upper segment very short, lateral ones longer, lowest still longer, wider, emarginate. *Corolla:* one-petalled, ringent; tube length of the calix; border erect; upper lip erect, concave, quite entire; lower lip of the same length, blunt, cloven into three equal segments. *Stamina:* filamenta four, filiform, length of the corolla, of which two are a little shorter; antheræ incumbent. *Pistil:* germen roundish; style in the same situation, and of the same form and length, with the stamina; stigma thickish, recurved. *Pericarp:* capsule ovate, compressed, two-celled, two-valved; partitions folded. *Seeds:* very many, chaffy, lanceolate, small. Essential Character. *Calix:* four-cleft; the upper lobe very small, the lowest large and emarginate.——The only species is,

1. Schwalbea Americana. Root biennial; stem quite simple, downy; leaves lanceolate, pubescent; flowers alternate, sessile; corolla dark red, inclining.—Native of America.

Schwenkfeldia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* involucre four-leaved; perianth one-leafed, five-parted, superior, permanent; segments lanceolate, acute. *Corolla:* one-petalled, funnel-form; tube long, slender; throat hirsute; border five-parted; segments lanceolate, acute. *Stamina:* filamenta five, inserted into the tube of the corolla; antheræ parallelopiped, incumbent. *Pistil:* germen inferior, ovate; style filiform; stigmas five, oblong. *Pericarp:* berry globular, crowned with the calix, five-celled. *Seeds:* numerous, very small, fastened to semilunar receptacles. Essential Character. *Involucre:* four-leaved. *Corolla:* funnel-form, hairy within. *Stigma:* five. *Berry:* five-celled, many-seeded. Willdenow says, corolla salver-form; stigma five-parted. ——The species are,

1. Schwenkfeldia Hirta. Leaves ovate-lanceolate, acuminate; flowers peduncled. This is a climbing shrub, with the stem and branches striated and hirsute.—Native of mountain-woods in Jamaica, flowering in April.

2. Schwenkfeldia Cinerea. Leaves oblong, acute, tomentose, hoary beneath; flowers subsessile. This is also a climbing shrub, with the stem and branches round and hispid.—Native of Cayenne and Guiana, found in hedges.

3. Schwenkfeldia Aspera. Leaves elliptic, acuminate, rough, paler beneath; flowers sessile.—Native of Guiana, on the banks of rivers.

Schwenkia; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, striated, straight, five-toothed, permanent. *Corolla:* one-petalled; tube cylindrical, length of the calix; border almost regular, length of the calix, inflated at the throat, five-plaited; plaits closing the orifice in form of a star, with a glandular body growing upon the exterior angles of the plaits, the two upper ones longer than the glands. *Stamina:* filamenta five; three shorter, bristle-shaped, without antheræ; two upper longer, fertile; antheræ two, ovate, acute, two-celled. *Pistil:* germen globular; style simple, length of the stamina; stigma obtuse. *Pericarp:* capsule compressed, like a lens, smooth, longer than the enlarged calix, two-celled, two-valved. *Seeds:* numerous, very small, somewhat angular. *Receptacle:* subglobular. Essential Character. *Corolla:* almost equal, with the throat plaited and glandular. *Stamina:* three, barren. *Capsule:* two-celled, many-seeded.—One species only has been found,

1. Schwenkia Americana; *Guiana Schwenkia.* A slender biennial shrub. Leaves alternate; flowers axillary, appearing in August and September.—Native of Berbice.

Scilla; a genus of the class Hexandria, order Monogynia. —Generic Character. *Calix:* none. *Corolla:* petals six, ovate, spreading very much, deciduous. *Stamina:* filamenta six, filiform, shorter by half than the corolla; antheræ oblong, incumbent. *Pistil:* germen roundish; style simple, length of the stamina, deciduous; stigma simple. *Pericarp:* capsule subovate, smooth, three-grooved, three-celled, three-valved. *Seeds:* many, roundish. Essential Character. *Corolla:* six-petalled, spreading, deciduous. *Filamenta:* filiform. *Stigma:* simple. *Capsule:* superior, three-celled. *Seeds:* roundish.——The species are,

1. Scilla Maritima; *Officinal Squill.* Naked-flowered, with refracted bractes. Root very large, sometimes pear-shaped, composed of many coats as in the Onion, and having several fibres coming out from the bottom, and striking deep in the ground: from the middle of the root arise several shining leaves about a foot long, and two inches broad at their base, lessening all the way to the top, where they end in points; they continue green all the winter, and decay in the spring: then the flower-stalk comes out, rising two feet high, naked about half way, and terminated by a pyramidal thyrse of white flowers. There are two varieties, one with a red, the other with a white root; but the white is generally preferred for medicinal use: though Dr. Woodville asserts that the red-rooted variety has been supposed to be more efficacious, yet he justly remarks that this red colour is confined to the outer coat of the roots. It is very nauseous, intensely bitter and acrimonious, without any perceptible smell. Alkalies considerably abate the bitterness and acrimony; vegetable acids make little alteration in either; but

the taste of the acid renders that of the squill more supportable. This is one of the few medicines known in the early ages of Greece, which is held in great estimation, and is in frequent use at this time; though it appears to act as a poison upon several animals. If much handled, it exulcerates the skin; and in large doses, frequently repeated, it not only excites nausea, but strangury, bloody urine, and hæmorrhoids, with fatal inflammation and gangrene of the stomach and bowels. Under proper management, however, it is a medicine of great practical utility. In dropsy, it has long been esteemed the most certain and effectual diuretic with which we are acquainted; and in asthma or dyspnœa, occasioned by the lodgment of tenacious phlegm, it has been the expectorant usually employed. In large doses it is apt to prove emetic, and sometimes purgative, by which the patient is deprived of its diuretic effects: it is given therefore in small doses, repeated at more distant intervals, or an opiate is joined with it. From a continued repetition, the dose may be gradually increased, and the intervals shortened: when thus the doses come to be tolerably large, the opiate may be most conveniently employed to direct the operation of the squill more certainly to the kidneys. In dropsy, when, from an effusion of water into the cavities, less water goes to the kidneys, it may be of use to add neutral salt. Dr. Cullen recommends a solution of corrosive sublimate to promote the diuretic effects of squills. When the *primæ viæ* abound with mucous matter, and the lungs abound with viscid phlegm, squills are in general estimation. As an expectorant, they may be supposed not only to attenuate the mucus, and thus facilitate its ejection, but, by stimulating the secretory organs and mucous follicles, to excite a more copious excretion of it from the lungs, and thereby lessen the congestion, upon which the difficulty of respiration very generally depends. Therefore in all pulmonic affections, excepting those of actual or violent inflammation, ulcer, or spasm, this has proved a useful medicine. The officinal preparations are, a conserve, the dried root, a syrup and vinegar, an oxymel, and pills. When this root is intended as a diuretic, it has most commonly been used in powder, with the addition of neutral salts, as nitre or crystals of tartar, especially where the patient complained of thirst. Others recommend calomel, and also add aromatics to accommodate weak stomachs. The dose of dried squill, is from two to four or six grains daily, or half that quantity twice a day. The dose of the other preparations, when fresh, should be four times this weight. On account of their very ungrateful taste, they are commonly given in the form of pills, made of the dried root reduced to powder, with the addition of syrup, or mucilage of gum arabic. Either the vinegar, syrup, or oxymel of squills, may be used as expectorants, in doses of two or three drachms, in cinnamon water, or some other cordial liquid; for in whatever form they are given, unless it is designed for them to act as an emetic, the addition of some warm grateful aromatic is necessary, to prevent that nausea which they are apt to occasion when given alone in ever such small quantities.—This plant grows on sea-shores and in ditches where the salt water flows in with the tide, in the warm parts of Europe. It cannot be propagated in gardens, the frost always destroying the roots in winter, while in summer they decay for want of salt water. Sometimes the roots put out stems and produce flowers, as they lie in the druggists' shops! In England it flowers in April.

2. Scilla Lilio-Hyacinthus; *Lily-rooted Squill.* Raceme few-flowered; peduncles without bractes; leaves lanceolate, pressed close to the ground; bulb ovate, scaly. The stalk is slender, and rises a foot high: it is terminated by the flowers, which are from six to nine, erect, light blue, appearing in June.—Native of Portugal, Spain, and the Pyrenees.—This, and most of the following species, are hardy, and may be propagated by seeds, or offsets; the latter, which is the most expeditious, being oftenest practised. The offsets may be taken off every other year, and planted out at the time the leaves and stem decay. The roots may be transplanted after the leaves are decayed; but if they are removed after they have put out new fibres, they rarely succeed, at least they will not flower in the following spring. They may be treated in every respect like the common sorts of Hyacinth. The seeds should be sown in autumn soon after they are ripe, either in shallow boxes, or pans, as directed for *Hyacinths.*

3. Scilla Italica; *Italian Squill.* Raceme conical, oblong; stem seven or eight inches high, terminated by clustered flowers of a pale blue colour, at first disposed in a sort of umbel or depressed spike, but afterwards drawing up to a point, and forming a conical corymb.—Native place uncertain; but found in different parts of the south of Europe.

4. Scilla Tetraphylla; *Four-leaved Squill.* Stemless: flowers in bundles; leaves in fours, ovate, lanceolate; root bulbous.—Native of Africa.

5. Scilla Peruviana; *Peruvian Squill.* Corymb crowned, conical; root large, solid, raised a little pyramidal in the middle, covered with a brown coat; from this come out before winter five or seven leaves, six or eight inches long, of a lucid green, keeled, and spreading almost flat on the ground. From the centre of these come out one, two, or three scapes, thick, succulent, six or eight inches high, terminated by a conical corymb of dark blue flowers, with purple stamens and pistil, and yellow pollen, upon pretty long pedicels. There is a variety with a white flower. It has long been known in the English gardens by the name of *Hyacinth of Peru.*—Supposed to be a native of Peru, and common in Spain and Portugal.

6. Scilla Japonica. Umbel terminating, fastigiate; scape erect, simple, smooth, a palm high.—Native of Japan.

7. Scilla Amœna; *Nodding Squill.* Scape angular; peduncles alternate, shorter than the flower; bractes obtuse, very short. Flowers blue.—Native of the Levant.

8. Scilla Præcox; *Early Squill.* Scape angular, racemed, subcorymbed; peduncles twice as long as the flower; bractes obscure.—Native country unknown.

9. Scilla Campanulata; *Spanish Squill.* Bulb solid; raceme many-flowered, oblong, subconical; corollas bell-shaped, erect; bractes two-parted, longer than the peduncle; leaves lanceolate; corolla of a deep blue violet-colour. It flowers in May.—Native of Spain and Portugal.

10. Scilla Bifolia; *Two-leaved Squill.* Root solid; flowers corymbed, racemed, without bractes, almost upright; leaves lanceolate, by rows. It varies with a white flower.—Native of Europe. Found also in the western parts of Great Britain, flowering in March and April.

11. Scilla Verna; *Vernal Squill.* Root solid; corymb hemispherical, few-flowered; bractes lanceolate, obtuse; leaves linear, channelled. The bulb, as well as the whole plant, smaller than any of the foregoing; but the herbage varies considerably in luxuriance, according to soil or culture.—This is a maritime plant, found among the rocks of Cornwall, on the western coast of Wales, on the isle of Man, and in the Hebrides. It flowers in April.

12. Scilla Lusitanica; *Portuguese Squill.* Raceme oblong, conical; petals marked with lines. It flowers in May.—Native of Portugal.

13. Scilla Orientalis; *Oriental Squill.* Flowers erect, racemed; leaves elliptic, ensiform.—Native of Japan, in the island of Niphon.

14. Scilla Hyacinthoides; *Hyacinthine Squill.* Raceme cylindrical, many-flowered; petals half as long again as the germen; peduncles coloured; leaves lanceolate; flowers numerous, small, blue. It flowers in August.—Native of the island of Madeira, &c. It is remarkable, that unless the offsets be frequently taken away from this species, it will not flower for twenty years together.

15. Scilla Lingulata; *Tongue-leaved Squill.* Leaves lanceolate, flat; raceme dense, conical; bractes awl-shaped, equalling the pedicels.—Native of the fields of Barbary, flowering in winter.

16. Scilla Villosa; *Villose-leaved Squill.* Leaves lanceolate, flat, villose; flowers corymbed.—Native of Barbary, flowering in winter.

17. Scilla Obtusifolia; *Blunt-leaved Squill.* Scape lateral; leaves tongue-shaped, waved; flowers corymbed.—Native of Barbary.

18. Scilla Parviflora; *Small-flowered Squill.* Leaves linear-lanceolate, acute, smooth, shorter than the scape; flowers racemed, crowded; bractes very short. It flowers in winter in the fields about Algiers.—Native of Barbary.

19. Scilla Undulata; *Wave-leaved Squill.* Leaves lanceolate, waved; flowers loosely racemed; bractes very short. The flowers are of a pale rose-colour, and fade before the foliage appears.—This species is very common in Barbary, on barren hills about Tunis, Constantine, and Algiers; flowering in autumn and at the beginning of winter.

20. Scilla Autumnalis; *Autumnal Squill.* Leaves linear; flowers corymbed, racemed; peduncles without bractes, ascending, length of the flowers; bulb ovate-roundish, coated, whitish. The leaves are numerous, varying in length and breadth; the flowers rather small, widely expanded, of an elegant crimson, with darker anthers.—Native of France, Spain, Italy, Barbary, and England: it is not uncommon in the dry pastures of the southern and western parts of England; and is found in several places near London, as on Blackheath; near Ditton; on Moulsey Hurst over against Hampton Court; on St. Vincent's rocks, near Bristol; and near Chace-water mine, and upon the Lizard Point in Cornwall.—This may be raised from seeds, which it produces in plenty, and it will flower the third year. It may be increased also, though slowly, by its bulbs, which should be planted in a light loamy soil, and placed in a dry part of the garden. It is best to plant the bulbs in pots, plunged in the border; for they will thus be secured from destruction when the border is dug.

21. Scilla Anthericoides; *Anthericum-like Squill.* Raceme long; bractes awl-shaped; pedicels shorter than the corolla.—Native of Barbary.

22. Scilla Unifolia; *One-leafed Squill.* Leaf subcylindrical, subspiked at the side.—Native of Portugal.

23. Scilla Nutans; *Harebell Hyacinth.* See *Hyacinthus Non scriptus*; which is the same plant.

Scirpus; a genus of the class Triandria. order Monogynia.—Generic Character. *Calix:* glumes chaffy, imbricated every way, ovate, flat, a little reflexed, uniform, all fertile, except occasionally a few of the outermost. *Corolla:* none. *Stamina:* filamenta three, finally becoming longer; antheræ oblong. *Pistil:* germen very small; style filiform, long; stigmas three, capillary. *Pericarp:* none. *Seed:* one, three-sided, acuminate, surrounded with villose hairs, shorter than the calix, or without any. *Observe.* Those villose hairs of the seeds, in some species are fastened to the tip, in others to the base of the seed. Essential Character. *Glumes:* chaffy, imbricate every way. *Corolla:* none. *Seed:* one, beardless.——The species are,

* *With a single Spike.*

1. Scirpus Mutatus. Culm three-sided, naked; spike cylindrical, terminating.—This is common in all the shallow standing waters of Jamaica, especially those to the east and west of Kingston.

2. Scirpus Spiralis; *Spiral Club Rush.* Culms aggregate, almost naked, three-sided; spike cylindrical, terminating; florets wedge-form, truncate, disposed spirally.—Native of the East Indies.

3. Scirpus Articulatus; *Half-jointed Club Rush.* Culm round, almost naked, half-jointed; head glomerate, lateral.—Native of Malabar, Egypt, and Japan.

4. Scirpus Plantagineus. Culms round, jointed, naked; spike terminating, cylindrical, naked.—Native of the East Indies.

5. Scirpus Nutans. Culm compressed, bluntly four-cornered, naked; spike ovate, solitary, terminating, nodding.—Native of the East Indies.

6. Scirpus Multicaulis; *Many-stalked Club Rush.* Culm round, sheathed at the base; spike ovate, terminating; glumes obtuse, equal; root fibrous, not creeping.—Native of turfy bogs in Lapland; and found on a bog at Carrybattachan in the isle of Skye, as also in Yorkshire, Norfolk, Sussex, and Cornwall.

7. Scirpus Cæspitosus; *Scaly-stalked Club Rush.* Culm round, striated, sheathed at the base with numerous scales; spike terminating; outer glumes very large; root fibrous, tufted. It is the principal food of sheep and cattle in the Highlands of Scotland.—Native of Europe, flowering in July.

8. Scirpus Pauciflorus; *Chocolate-headed Club Rush.* Culm round, striated, sheathed at the base; spike terminating, few-flowered, longer than the outer glumes; root tufted, blackish.—Native of Sweden, Germany, Switzerland, France, and Britain. Found in Ellingham fen, Norfolk; on Pornigland heath, near Norwich; Houghton moor, near Newbold; near Beverley in Yorkshire; and on the Highlands of Scotland, flowering in August.

9. Scirpus Campestris. Culm striated, naked; spike terminating, scarcely exceeding the two-valved calix; calix-glumes oblong, membranaceous at the tip, blunt, almost equal.—Native of the dutchies of Oldenburgh and Bremen.

10. Scirpus Atro-purpureus. Culms setaceous, round, in bundles; spikes terminating, ovate, solitary; flowers one-stamined.—Native of the East Indies.

11. Scirpus Polytrichoides. Culms compressed, setaceous; spikes terminating, solitary, somewhat nodding. one-stamined.—Found in Ceylon and Amboyna.

12. Scirpus Fluitans; *Floating Club Rush.* Stem leafy, flaccid, floating; peduncles alternate, naked; spikes solitary, terminating; root small, fibrous.—Native of Germany, France, Flanders, and England, in ditches and little pools, upon grassy commons and heaths, where the water is apt to be dried up in summer, in which case it sometimes grows more luxuriantly. It has been met with on Wandsworth and Streatham commons in Surry; in the bogs on Harefield common in Middlesex; on Putney and Hounslow heaths; on the heath between Farnham and Godalming; on St. Faith's bogs near Norwich; on Chorley forest in Leicestershire; abundantly in Dorsetshire; in small rills about Newton Cartmel; at Salesmoor near Manchester; upon Stockton common, Terrington car, and many other watery heaths in Yorkshire; and at Haverfordwest in Pembrokeshire, South Wales.

** *A round Culm, with several Spikes.*

13. Scirpus Lacustris; *Tall Club Rush,* or *Bull Rush.* Culm round, naked; panicle cymed, decompounded, terminating; spikelets ovate. Roots creeping under water horizon-

tally, thick and strong; stem four or five feet high.—This Rush is very generally used for bottoming chairs: if cut at one year old, it makes the fine bottoms; coarse bottoms are made of it of two years' old; such as are still older, mixed with the leaves of *Iris Pseudacorus*, make the coarsest bottoms. Mats are also made either with this Rush alone, or mixed with Log leaves. Cottages are sometimes thatched, and pack-saddles stuffed, with it. It is of a soft pliant texture, totally destitute of the roughness or cutting edges of many grass-like plants. In hard seasons cattle will eat it.—Native of Europe, Siberia, Japan, Jamaica, and of North America, where it is found in stagnant waters, from Canada to Carolina. It flowers in July and August, and grows abundantly in clear ditches and streams, fens, pools, and lakes.

14. Scirpus Glomeratus. Culm naked, roundish; umbel glomerate; involucre two-leaved, short; flowers two-stamined.—Native of Ceylon.

15. Scirpus Arvensis. Culm compressed, striated; umbels simple; involucre one-leafed, short.—Native of Ceylon.

16. Scirpus Truncatus. Culm round; head glomerate, globular; involucre two-leaved; leaves linear.—Native of the Cape.

17. Scirpus Laciniatus. Culm round; head triangular; glumes ovate, ciliate; involucre two-leaved.—Native of the Cape.

18. Scirpus Membranaceus. Culm round; head angular; glumes ovate, membranaceous; involucre three-leaved.—Native of the Cape.

19. Scirpus Pilosus. Culm compressed; head ovate; glumes lanceolate, ciliate; involucre four-leaved.—Native of the Cape.

20. Scirpus Hystrix. Culm capillary; head commonly two-spiked; glumes acuminate, squarrose; involucre one-leafed.—Native of the Cape.

21. Scirpus Holoschœnus; *Round Cluster-headed Club Rush.* Culm round, naked; heads glomerate, peduncled, or sessile; involucre two-leaved, unequal; leaves channelled. Root tufted, perennial; stem rushy, firm, smooth, two or three feet high.—Native of England, Germany, and the southern parts of Europe and Barbary: found in this country at Braunton Borough's, Devonshire; and in Somersetshire and Hampshire. There are two varieties common in the south of Europe.

22. Scirpus Nodosus. Culm compressed, knotted; head glomerate, mucronate.—Native of the Cape.

23. Scirpus Radiatus. Culm round; head hemispherical; involucre many-leaved.—Native of the Cape.

24. Scirpus Setaceus; *Bristle-stalked Club Rush.* Culm naked, setaceous; spikes lateral, commonly two, sessile, without bractes. Root fibrous, tufted; stems several, slender, two to five inches high.—Native of most parts of Europe, in wet sandy ground, and on sandy coasts, flowering in July.

25. Scirpus Supinus. Culms striated, each with a single sheathing leaf; spike sessile, glomerate in the middle of the culm.—Native of France, near Paris, Brandenburg, and Cochin-china.

26. Scirpus Natans. Culm compressed, leafy, flexuose, erect; spikes two, lateral.—Native of the Cape.

27. Scirpus Vaginatus. Culm filiform; heads lateral, alternate, shorter than the involucre.—Native of the Cape.

28. Scirpus Tristachyos. Culm capillary; head three-spiked; glumes entire; involucre two-leaved.—Native of the Cape.

29. Scirpus Uncinatus. Hairy: culm round, leafy; spikes conglomerated into a head, terminating, and axillary.—Native of the East Indies.

30. Scirpus Aristatus. Culm striated, round, leafy; panicle terminating, two-leaved; spikelets ovate, squarrose, echinate.—Native of the East Indies.

31. Scirpus Diphyllus. Culms semicylindrical, striated, two-leaved; umbel compound, with a two-leaved involucre longer than it.—Native of the East Indies.

32. Scirpus Fastiglatus. Culm filiform; head convex, compressed; outer glumes mucronate; involucre none.—Native of the Cape.

33. Scirpus Globulosus. Culm compressed, naked; panicle terminating; spikelet single, sessile, several, peduncled, globular.—Native of the East Indies.

34. Scirpus Globiferus. Culm naked, round; umbel terminating, compound; heads globular, composed of several spikelets, closely heaped.—Native of Teneriffe.

**** Culm three-sided; Panicle naked.*

35. Scirpus Tricuspicatus. Culm angular, naked; spikes terminating in threes, sessile, naked.—Native of the Cape.

36. Scirpus Lateralis. Culms three-sided, naked; spikes subtern, lateral; involucre one-leafed, short.—Native of Ceylon.

37. Scirpus Triqueter; *Triangular Club* or *Bull Rush.* Culm three-sided, straight, tomentose; spikes lateral, sessile, or peduncled. Root fibrous, tufted, perennial; stems erect, three feet high, dark green, with three acute angles. A variety is found in the island of Jersey.—Native of Germany, England, and other parts of Europe, and also North America. In England it generally occurs on the sea-shore, and on the banks of large rivers, as by the Thames, both above and below London; observed also in the side of Acle Dam, in Norfolk.

38. Scirpus Mucronatus. Culm triangular, naked, acuminate; spikes conglomerate, sessile, lateral. This is easily distinguished from the preceding, by its great stature; its thicker culm, the angles more acute, with the intermediate spaces a little hollowed; its thicker ovate spikelets, twenty or more collected into a head; and being of a finer grass-green.—Native of Switzerland, the south of France, Carniola, and Italy.

39. Scirpus Dichotomus. Culm three-sided, naked; umbel decompounded: spikes in the forks sessile. This is an annual. Two varieties have been found in Ceylon.—Native of the East Indies, Arabia, Italy, and Barbary.

40. Scirpus Echinatus. Culm three-sided, naked; umbel simple; spikes ovate; leaves carex-form, length of the culm.—Native of both Indies.

41. Scirpus Retrofractus. Culm three-sided; umbel simple; floscules of the spikes retrofracted.—Native of Virginia.

42. Scirpus Ferrugineus. Culm three-sided, almost naked; involucres length of the panicle, and ciliate.—Native of Jamaica, and other islands of the West Indies, both in dry and wet situations.

43. Scirpus Spadiceus. Culm three-sided, naked; umbel almost naked; spikes oblong, sessile, and terminating.—Native of South America, Virginia, and Jamaica.

***** Culm three-sided; Panicle leafy.*

44. Scirpus Anomalus. Culm three-sided, leafy; panicle terminating, short; spikelets ovate; flowers corolled, the lower one-stamined, the upper two-stamined.—Native of the East Indies.

45. Scirpus Miliaceus. Culm three-sided, naked; umbel superdecompound; intermediate spikes sessile; involucres setaceous.—Native of the East Indies.

46. Scirpus Maritimus; *Salt-marsh Club Rush.* Culm three-sided; panicle clustered, leafy, terminating; glumes mucronate, lacerate, trifid. Roots creeping, knotty at the extremities, sometimes they are more evidently and constantly so than in general. There are many varieties of this species;

and, Linnæus observes, that the anatomy of the parts of fructification shews that all these varieties make but one species. The Bishop of Drontheim observes, that it is very greedily devoured by all sorts of cattle. Mr. Curtis suggests, that swine being extremely fond of the roots of the *Scirpus Palustris*, (see North American species,) which the Swedish peasants collect, and fodder them with in the winter, and the roots of this species being much larger, it would probably be preferable to that for similar purposes. Dr. Withering relates, that the roots, dried and ground to powder, have been used for flour in times of scarcity. Villars observes, of the Scirpi in general, that being mostly natives of bogs, marshes, and watery places, they have a tendency to raise and dry such spots. The roots and base of the stems rot, and become turf, and are thus made useful for firing, and to fertilize grounds that have been exhausted by long culture.—Native of Europe, Barbary, and Siberia, on sea-coasts, salt-marshes, and estuaries, or on the banks of great rivers, exposed to the tide, flowering through July and August. It has been noticed at Sheerness, and at the Isle of Dogs; near Yarmouth; at Shirley Wych, near Stafford; between Stockton and Porterach; and by the river Tees.

47. Scirpus Pubescens. Culm three-sided, leafy, pubescent at top; spikelets few, directed one way, terminating, ovate; glumes mucronate.—It is found on the banks of lakes, near La Calle in Barbary, flowering in summer.

48. Scirpus Grossus. Culm three-sided, naked; umbel superdecompound; spikes pedicelled; involucre three-leaved, lanceolate, subulate, very long; spikelets ovate, ferruginous. —Native of the East Indies.

49. Scirpus Luzulæ. Culm three-sided, naked; umbel leafy, proliferous; spikelets roundish.—Native of the East Indies; flowering in August.

50. Scirpus Sylvaticus; *Wood Club Rush*. Culm three-sided, leafy; cyme leafy, terminating; peduncles naked, superdecompound; spikes clustered.—Native of Europe, Siberia, and Canada, in wet woods and shady places. In England, it has been observed in Essex, Warwickshire, and Pembrokeshire; also close by the river Blackwater, below Bocking; in Charlton wood; in various parts of Norfolk and Oxfordshire; by the Thames side; near Tamworth in Warwickshire; between Kettering and Thorp Malsor, in Northamptonshire; near Nottingham; in a brook near Haverfordwest in Pembrokeshire, South Wales; and in Scotland, a little east of Breakin bridge, over the South Esk, on the south side. It flowers in July.

51. Scirpus Corymbosus. Culm three-sided, leafy; corymbs lateral, simple; the terminating one proliferous; spikes subulate.—Native of India.

52. Scirpus Æstivalis. Culms depressed, three-sided, naked; umbels compound, involucred; flowers one-stamined. —Native of Ceylon.

53. Scirpus Squarrosus. Culm three-sided, naked, setaceous; spikes in threes, sessile, ovate, squarrose.—Native of the East Indies.

54. Scirpus Dipsaceus. Culms setaceous, three-sided; umbel simple; heads oblong, squarrose; floscules subulate, recurved, two-stamined; germen echinate.—Native of the East Indies.

55. Scirpus Junciformis. Culm naked, filiform, subtrigonal; spikelets of the panicle sessile and peduncled; involucre two-leaved.—Native of China.

56. Scirpus Michelianus. Culm three-sided; head globular; involucre many-leaved, long. This is an annual species. —Native of Germany, France, about Montpellier, Italy, Media, and Morocca, by the river Sebou.

57. Scirpus Ciliaris. Culm three-sided, leafy; umbels scattered; scales of the calix with ciliate awns.—Native of the East Indies.

***** *Culm three-sided; Head terminating.*

58. Scirpus Hottentottus. Culm three-sided, leafy; head globular; calicine scales lanceolate, rough-haired.—Native of the Cape.

59. Scirpus Antarcticus. Culm three-sided, naked; head globular; involucre one-leafed.—Native of Guinea.

60. Scirpus Argenteus. Culms setaceous, three-sided; involucre four-leaved, very long; spikes cylindrical, very many, glomerate into a head.—Native of the East Indies.

61. Scirpus Monandrus. Culm setaceous, three-sided; involucre three-leaved, long; head sessile, glomerate; floscules one-stamined.—Native of the East Indies.

62. Scirpus Cephalotes. Culm three-sided, naked; head ovate, squarrose; involucre three-leaved, long.—Native of the East Indies.

North American species of Scirpus, according to the Arrangement given in Pursh's Floræ Amcricæ Septentrionalis.

* *Culm monostachyous.*

1. Scirpus Acicularis. Spike ovate; culms tetragonal, setaceous; sheaths beardless.—In shallow ponds and pools under water, common.

2. Scirpus Pusillus. Spike oblong, acute, with few flowers; squames linear, acute; culms angular, capillary. In springs and ditches, frequent.—This is the smallest of the genus.

3. Scirpus Palustris. Spike oval; squames lanceolate, acute; culms round; sheaths beardless, lanceolate, acute; root creeping.—In overflowed fields and ditches, frequent.

4. Scirpus Tuberculosus. Spike ovate, acute; squames subrotund; seeds crowned with an ovate tubercle; culms cylindrical.—Grows in Lower Carolina.

5. Scirpus Filiformis. Spike cylindrical, oblong, obtuse; squames subrotund; seeds naked at the vertex; culms filiform, round.—In wet fields, near ditches, from New Jersey to Carolina.

6. Scirpus Ovatus. Spike ovate; squames oblong; flowers subdiandrous; culms subcompressed; sheaths beardless.—Near ponds and ditches, in Pennsylvania.

7. Scirpus Capitatus. Spike subglobose; culms sulcate-angular, setaceous; sheaths beardless.—In small ponds, very common.

8. Scirpus Geniculatus. Spike ovate-oblong; squames ovate-subrotund; culms round.—On the sea-shore of Virginia and Carolina.

9. Scirpus Quadrangularis. Spike cylindrical; squames oblong-subrotund; culms tetragonal.—In Carolina.

** *Culm polystachyous; Spikes lateral.*

10. Scirpus Minimus. Spikes ovate, acute, subsolitary; culms and leaves capillary, curved.—In wet sandy fields, and near ponds, from Virginia to Carolina.

11. Scirpus Debilis. Spikes short-ovate, conglomerate-sessile; squames subrotund, membranaceous; culms striated. —In the wet meadows of Pennsylvania.

12. Scirpus Mucronatus. Plant aphyllous; spikes oblong; squames very entire, mucronate-acuminate; culm triquetrous. —In swamps and salt-marshes, from Canada to Carolina.

*** *Culm polystachyous; Spikes terminal.*

13. Scirpus Validus. Plant aphyllous; spikes ovate-oblong; squames villose on the back; styles bifid; umbel decompound; involucre very short, with a round apex.—In lakes and ponds from Canada to Carolina. From four to ten feet high.

14. Scirpus Robustus. Spikes oblong; corymb compound; involucres polyphyllous, very long; involucels ovate, aristated

at great length; squames acute, aristated; culm triquetrous, leafy.—In salt marshes, and on the banks of rivers, common.

15. Scirpus Americanus. Spikelets sessile, conglomerate, oblong-ovate, shorter than the spine; culm acutely triquetrous, naked.—In salt marshes, frequent.

16. Scirpus Exaltatus. Spikes short-ovate, heaped together: corymb compound; squames rhomboideous, carinated, mucronated, coloured; culm leafy, obtusely three-cornered.—In shady woods, from New York to Carolina. There is a variety named Scirpus Viviparus, with a very tall subscandent culm, and viviparous corymbs, bearing flowers at the base of the branchlets. It grows in deep shady swamps, and frequently acquires the height of ten feet or more.

17. Scirpus Nitens. Spikes ovate, pedicellate; corymbs subcompound, axillary, terminal; culm round.—In Virginia and Carolina.

18. Scirpus Lineatus. Spikes oblong-ovate, pedicellate; corymbs axillary, terminal, supradecompound; peduncles elongate; culm three-cornered.—In sandy wet woods, from New Jersey to Carolina.

19. Scirpus Polyphyllus. Spikes and heads subglobose, glomerate; corymb terminal; culm leafy.—In the shady woods of Virginia and Carolina.

20. Scirpus Capillaris. Spikes ovate; umbel biradiate; culm capillary.—In Virginia.

21. Scirpus Autumnalis. Spikes oblong, acute; involucre diphyllous, shorter than the compound umbel; culm two-edged; leaves linear.—In sandy wet fields, from New Jersey to Carolina.

Sciuris; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-toothed, short, acute. *Corolla:* one-petalled, tubular, curved in, two-lipped; upper lip trifid, with the middle segment a little longer; lower a little shorter, bifid. *Stamina:* filamenta two, short, inserted into the upper lip, fenced by two scalelets at the base; there are three longer, inserted into the lower lip, hairy at the base, barren; antheræ oblong, bifid at the base. *Pistil:* germen five-cornered, sorrounded by a gland; style length of the corolla, curved in; stigma flattish, three-lobed. *Pericarp:* capsules five, united, outwardly rounded, depressed, one-celled, two-valved, opening inwardly. *Seeds:* solitary, oblong. Essential Character. *Calix:* five-cleft, short. *Corolla:* unequal, with the upper lip trifid, the lower bifid and shorter. *Stamina:* five, but three barren. *Capsules:* five, united, one-celled, one-seeded.——The only known species is,

1. Sciuris Aromatica. Leaves opposite, petioled, ternate; leaflets oblong, acuminate, quite entire, with pellucid dots scattered over them; spikes axillary, nodding, many-flowered. This is a shrub, two feet in height, with opposite divaricate branches. Each flower has a little bracte.—Native of Guiana, in woods.

Scleranthus; a genus of the class Decandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, tubular, half five-cleft, acute, permanent, contracted at the neck. *Corolla:* none. *Stamina:* filamenta ten, awl-shaped, erect, very small, placed on the calix; antheræ roundish. *Pistil:* germen roundish; styles two, erect, capillary, length of the stamina; stigmas simple. *Pericarp:* none. *Seed:* single, or two, ovate, enclosed in the cartilaginous tube of the calix. Essential Character. *Calix:* one-leafed, inferior. *Corolla:* none. *Seeds:* two, enclosed in the calix.——The species are,

1. Scleranthus Annuus; *Annual Knawel.* Calices of the fruit patulous, acute; stems spreading. Root annual, fibrous, small, but striking deep, little or not at all branched; stems numerous, round, leafy, branched at the upper part, of a brownish or reddish colour; leaves opposite, united and fringed at the base, linear, acute, of a grassy-green colour; flowers sessile in terminal, leafy clusters. The Swedes and Germans receive the vapour arising from a decoction of this plant into their mouths, in order to cure the tooth-ache. Hardly any plant is more common than this on a sandy soil, especially in fallow fields. It flowers about the middle of summer, and sows its seed very abundantly in autumn, which produces a crop of young plants that generally survive the winter, or, if destroyed, are replaced by another crop, arising from those seeds which happen not to vegetate till spring.—Native of Europe and Siberia.

2. Scleranthus Perennis; *Perennial Knawel.* Calices of the fruit closed, obtuse; stems procumbent; root fibrous, perennial. It has the habit of the preceding. The *Coccus Polonicus* is found upon the roots of this plant in the summer months. This species is much more rare in England than the annual: it has been observed on the dryest barren sandy heaths in Norfolk and Suffolk: also at Elden, and between Newmarket and Thetford, and near Bury and Snettisham. It flowers in November.—Native of Europe and Siberia.

3. Scleranthus Polycarpus; *Many-fruited Knawel.* Calices of the fruit spreading very much, and spiny; stem subvillose; root annual.—Native of France and Italy.

Scleria; a genus of the class Monœcia, order Triandria.—Generic Character. *Male Flowers,* in the same spikelet or panicle, mixed with the females. *Male Spikelets:* solitary or androgynous. *Calix:* glume from two to six valved, many-flowered; valves ovate, acute, keeled, concave, awnless, permanent. *Corolla:* glumes very many, oblong, awnless, longer and more slender than those of the calix, separating the stamina. *Stamina:* filamenta solitary, or three within each corolline glume; antheræ linear. *Female spikelets:* solitary, axillary, terminating, or inserted between the male calicine glumes. *Calix:* glume two to four valved, one-flowered; valves ovate, acute, awnless, keeled, concave, permanent. *Corolla:* none. *Pistil:* germen roundish, attenuated at the base; style filiform, length of the glumes, undivided or trifid; stigmas capillary, reflexed. *Pericarp:* none. *Seed:* nut subglobular or oblong, coloured; kernel roundish, veined. Essential Character. *Male. Calix:* glume from two to six valved, many-flowered, awnless. *Corolla:* glumes awnless. *Filamenta:* one to three. *Female. Calix:* from two to six valved, one-flowered, awnless. *Stigmas:* one to three. *Seed:* nut subglobular, somewhat bony, coloured.——Of this genus Willdenow enumerates twenty-three species; to which Mr. Brown adds five more, natives of New Holland. The following are given as a specimen:

1. Scleria Flagellum. Culm three-sided, scandent, very rugged; leaves prickly, backward three ways; flowers panicled; rachis villose. Sloane says, this runs fifteen feet high among bushes, by which it is supported; and that there is a hollow between the angles of the culm as in a sword-blade; that the culm and leaves are of a dark green; and that the seed which comes out between two black glumes, is roundish, large, and whitish, like that of Gromwell or Pearl Barley.—Native of Jamaica, Surinam, and Africa.

2. Scleria Mitis. Culm three-sided, scandent, even; leaves even; flowers panicled; rachis rough.—Native of Jamaica and Surinam.

3. Scleria Lithosperma. Culm three-sided, somewhat rugged, erect; leaves strict, linear, rugged at the edge; flowers panicled; rachis rough.—Native of the East Indies, Africa and the Isle of Tanna in the Pacific Ocean.

4. Scleria Filiformis. Culm simple, filiform, even; leaves subulate; spike almost simple; floscules smooth, having a filiform leaflet under them.—Native of Jamaica and Hispaniola, in very dry rocky places.

5. Scleria Hirtella. Culm simple, filiform, pubescent; leaves linear; spike simple; floscules rough-haired. Hardly a foot high.—Native of Jamaica.

6. Scleria Latifolia. Culm three-sided, leafy, erect, even; leaves broad, lanceolate, nerved; flowers panicled. Six feet high.—Native of Jamaica, especially in the western parts, in dry mountain woods.

7. Scleria Poæformis. Culm leafless; panicles contracted, with flexuose branches; spikelets sessile; female spikes axillary, males two-flowered. It has almost the appearance of a Poa, as its name intimates.—Native of the East Indies.

8. Scleria Lævis. Culm leafy; leaves unarmed; branches of the panicle divided, involucred; male spikes sessile, and peduncled.—Native of the East Indies.

9. Scleria Ciliata. Culm erect, somewhat glabrous; leaves ciliate, with the terminal fascicle ciliate; nuts globose, somewhat scabrous.—Grows in the dry woods of Virginia, Carolina, &c.

10. Scleria Triglomerata. Culm erect, simple, triquetrous, scabrous; leaves scabrous at the margin; fascicles with few flowers, terminal; glumes ovate, mucronate, scabrous; nuts globose, acute, wrinkled.—In dry swamps and old fields, from Pennsylvania to Carolina.

Sclerocarpus; a genus of the class Syngenesia, order Polygamia-Frustranea.—Generic Character. *Calix:* common of six leaflets, of which three are exterior, three interior alternately; exterior biggish, of the same structure and appearance with the leaves, spreading, two large, the third less; interior linear, channelled, acute, erect, with a spreading tip, length of the floscules. *Corolla:* compound, radiate. *Corollets:* hermaphrodite, ten in the disk; female three in the ray, each within one of the interior calicine leaflets. Proper of the hermaphrodites, tubular, five-cleft; of the female ligulate, roundish. *Stamina:* in the hermaphrodites; filamenta five, capillary; antheræ five, small, united, each awned at the tip. *Pistil:* in the hermaphrodites; germen oblong, compressed, outwardly gibbous; style filiform, length of the corollet; stigma deeply bifid, revolute; in the females, germen slender; style none; stigma none. *Pericarp:* none, except the chaffs involving the seeds. *Seeds:* in the hermaphrodites, solitary, oblong, compressed, with the outer margin gibbous, the inner straight; pappus none: the females have no seed. *Receptacle:* convex, small. Essential Character. *Calix:* six-leaved, three exterior larger, like the leaves, three internally smaller, like scales, alternate; pappus none. *Receptacle:* chaffy.——The only known species is,

1. Sclerocarpus Africanus. Leaves three-nerved; flowers solitary, terminating; chaffs permanent, hardening, acuminate.—Native of the Cape of Good Hope.

Scolopia; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, three or four parted, permanent; segments ovate, obtuse, concave, spreading. *Corolla:* petals three or four, oblong, subcoriaceous, obtuse, spreading, permanent, twice the length of the calix. *Stamina:* filamenta numerous, filiform, flattish below, villose at the base, spreading, permanent, length of the corolla, inserted into the calix; antheræ linear. *Pistil:* germen roundish, superior; style cylindrical, straight, longer than the stamina; stigma thickened, three-lobed, impressed above with three little pits. *Pericarp:* berry roundish, crowned with the permanent style, one-celled. *Seeds:* six, rounded, four-sided, arilled; the Arils membranaceous, thin, pulpy, angular, two fastened to the ribs, glued to the inner wall of the berry. *Observe.* The ribs easily separate from the berry, and are resolved into six unequal threads, from the apex of which the arils hang down. Essential Character. *Calix:* inferior, three or four parted. *Corolla:* three or four petalled. *Berry:* crowned with the style, one-celled, six-seeded. *Seeds:* arilled.——The only species is,

1. Scolopia Pusilla. Berry elliptic-sphæroidal, crowned with a short style, fleshy, coriaceous, divided within into three incomplete cells by three prominences; pulp separated every way from the cell by a very thin membrane, and formed into three soft oblong bags, in which the seeds are lodged. There are generally two seeds in each bag, seldom three, placed on each other, obliquely and irregularly truncate at the point of contact, in other parts subovate, convex on one side, angular on the other, black, and somewhat shining. The Ceylonese call this plant *Khatu-Kurundu*, Thorny Cinnamon; hence it probably resembles the Cinnamon in leaves and outward appearance, but differs from it in having thorns.

Scolosanthus; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, superior, small, four-cleft; segments linear, lanceolate, four times shorter than the corolla, acute, spreading. *Corolla:* one-petalled, with claws, tubular before it opens, exactly four-cornered, the angles acute, a little curved in, gradually widening upwards, when opened bluntly four-cornered; border four-cleft; segments ovate, acute, revolute. *Stamina:* filamenta four, erect, scarcely placed at the bottom of the corolla, cohering a little at the base in a four-cornered smooth tube, a little hairy below; antheræ linear, erect, the length of the tube. *Pistil:* germen inferior, roundish; style capillary, longer than the corolla; stigmas two, small, obtuse. *Pericarp:* drupe subglobular, size of black pepper, smooth, succulent, mucronate with the permanent calicine segments. *Seed:* one, in an oblong, somewhat stony, one-celled shell. Essential Character. *Calix:* four-cleft. *Corolla:* tubular, with are volute border. *Drupe:* one-seeded.——The only species is,

1. Scolosanthus Versicolor. A branched shrub, two feet high. Leaves subsessile, opposite, from two to five on each side, seldom more, solitary, scarcely half an inch long, others a little smaller, obovate, quite entire, subcoriaceous, veinless, shining; fruit snow-white. The young thorns generally bear flowers, which are purple, and abortive; after their fall, the thorns grow to their full size: the axillary flowers are of a saffron colour, perfect, and ripen their fruit.—Found in the island of Santa Cruz.

Scolymus; a genus of the class Syngenesia, order Polygamia-Æqualis. *Calix:* common imbricate, ovate; scales numerous, lanceolate, spiny, loose. *Corolla:* compound imbricate, uniform; corollets hermaphrodite, numerous, equal; proper one-petalled, ligulate, linear, truncate, very finely five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* germen oblong; style filiform, longer than the stamina; stigmas two, reflexed. *Pericarp:* none; calix unchanged. *Seeds:* solitary, somewhat oblong, triangular, acuminate at the base; pappus none. *Receptacle:* chaffy, convex; chaffs roundish, flat, three-toothed at the tip, longer than the seeds, and separating them. Essential Character. *Calix:* imbricate, spiny. *Pappus:* none. *Receptacle:* chaffy.——The species are,

1. Scolymus Maculatus; *Annual Golden Thistle.* Flowers solitary; leaves cartilaginous at the edge; involucres pectinate-multifid. Stalk branching, four or five feet high. Flowers from the forks of the crowded upper branches, solitary, an inch and a half broad, beset with copious spinous

leaves; corolla of a golden yellow.—Native of the south of Europe and Barbary, on sunny sandy banks, and among rubbish. Sow the seeds in March or April, on a bed of fresh undunged earth, in an open situation; when the plants come up, keep them clear from weeds, and thin them so as to leave them about two feet asunder. As they send forth tap-roots, they will not bear planting well. If the season should be warm and dry, they will perfect their seeds in autumn; but in wet seasons they rarely perfect their seeds in England.

2. Scolymus Hispanicus; *Perennial Golden Thistle.* Flowers heaped; involucres leafy, tooth-spiny. Root perennial, from which spring up many thick stalks, that rise about three feet high, branching out on the sides the whole length, and having stiff jagged leaves. Mr. Miller observes, that the leaves, stalks, and root, abound with a milky juice; that the people of Salamanca eat it in the same manner as Chardon; and that the Spaniards adulterate their Saffron with the flowers. It flowers from July to September.—Native of the south of Europe, and of Barbary. This, and the following, may be increased by offsets.

3. Scolymus Grandiflorus; *Great-flowered Golden Thistle.* Flowers solitary, the upper ones approximating; involucres coriaceous, nerved, lanceolate, acute; root perennial, fusiform, white, the thickness of a finger. The whole plant milky. This is a very beautiful species, flowering early in spring, and now cultivated in the European gardens. The Arabs eat the stalks both raw and boiled.—Native of Egypt, and very common in the fallows of Barbary.

Scoparia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four-parted, concave; segment slender, rugged. *Corolla:* one-petalled, wheel-shaped, spreading, concave, four-parted; segments tongue-shaped, obtuse, equal; throat bearded. *Stamina:* filamenta four, equal, awl-shaped, shorter than the corolla; antheræ simple, roundish. *Pistil:* germen globose; style awl-shaped, length of the corolla, permanent; stigma acute. *Pericarp:* capsule oblong, conical, acuminate, one-celled, two-valved. *Seeds:* very many, oblong. Essential Character. *Calix:* four-parted. *Corolla:* four-parted, wheel-shaped. *Capsule:* one-celled, two-valved, many-seeded.——The species are,

1. Scoparia Dulcis; *Sweet Scoparia.* Leaves in threes; flowers peduncled. Root annual; stalk hexangular, rising nearly two feet high, and sending out many branches, which have three leaves placed round at each joint; flowers numerous, axillary, solitary, small, white; capsule the size of hemp-seed. The French call this plant *Balaidoux*, or Sweet Besom; the Spaniards *Escobilla Menuda*, or Little Besom: they both use it in disorders of the breast; and Browne says, it may be considered as an excellent vulnerary. Sloane says the leaves have a sweet taste, like liquorice; and is known in Jamaica by the name of Wild Liquorice, or Sweet Weed. It flowers from June to September.—Native of Jamaica, America, the Caribbee islands, and also of Cochin-china.—Sow the seeds upon a hot-bed in the spring; and when the plants are fit to remove, plant them upon a fresh hot-bed, shading and watering them until they have taken new root; after which admit air to them daily, according to the warmth of the season, and refresh them frequently with water. In June they may be taken up with balls of earth to their roots, and planted into open borders, where they will flower, perfect their seeds in the autumn, and soon after perish.

2. Scoparia Procumbens. Leaves in fours; flowers sessile. Scarcely six inches long, like the former in habit, but the stems are forked.—Native of New Spain.

3. Scoparia Arborea. Leaves lanceolate, alternate, quite entire; corymb superdecompound, trichotomous. A tree, with the habit of an Olea or Phillyrea.—Native of the Cape.

Scopolia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth of one leaf, inferior, small, in five deep, ovate, acute, concave, spreading, permanent segments. *Corolla:* petals five, oblong, sessile, erect, bluntish, concave, keeled at the upper part behind; nectary none. *Stamina:* filamenta five, awl-shaped, erect, opposite to the petals, and rather longer, dilated and triangular at the base; antheræ roundish, incumbent. *Pistil:* germen superior, roundish, with five furrowed lobes; style scarcely longer than the germen, furrowed lengthwise, swelling in the middle; stigma three-lobed, obtuse. *Pericarp:* capsule of five cells, nearly globose, dotted, with a succulent coat, some of the cells often abortive. *Seeds:* solitary, oblong, somewhat kidney-shaped. Essential Character. *Calix:* inferior, five-cleft. *Petals:* five. *Nectary:* none. *Stigma:* capitate. *Capsule:* succulent, of five cells. *Seeds:* solitary.——The species are,

1. Scopolia Aculeata. Stem prickly; leaflets obovate, bluntly pointed; panicles axillary. A stove plant: the branches, and sometimes the footstalks, are armed with hooked prickles, like those of the Rose; flowers small, white. The whole plant sprinkled with glandular dots.—Native of the East Indies, the isle of Bourbon, &c.

2. Scopolia Inermis. Stem unarmed; leaflets obovate, obtuse. This has the habit of the preceding species.—Supposed to be a native of the isle of Bourbon.

Scorpion Senna. See *Coronilla Emerus.*

Scorpiurus; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, erect, inflated, very slightly compressed, half five-cleft, acute; teeth almost equal, the upper ones less divided. *Corolla:* papilionaceous; banner roundish, emarginate, reflexed, spreading; wings subovate, loose, with a blunt appendix; keel half-mooned, with the belly gibbous, acuminate, erect, two-parted below. *Stamina:* filamenta diadelphous, (simple and nine-cleft,) ascending; antheræ small. *Pistil:* germen oblong, cylindrical, a little reflexed; style bent in upwards; stigma a terminating point. *Pericarp:* legume oblong, subcylindrical, coriaceous, striated, rugged, revolute, divided internally into several transverse cells, obscurely knobbed externally by the contraction of the joints. *Seeds:* solitary, roundish. Essential Character. *Legume:* divided by isthmuses, or transverse partitions, revolute, cylindrical.——The species are,

1. Scorpiurus Vermiculata; *Common Caterpillar.* Peduncles one-flowered; legumes covered all over with blunt scales. Stalks herbaceous, trailing, above a foot long, lying on the ground, and having at each joint a spatulate leaf on a long footstalk; flower-stalks axillary, each bearing a simple yellow flower; succeeded by a thick twisted legume, of the size and appearance of a large green caterpillar.—Native of the south of Europe, flowering in June and July. The plants of this genus are all annuals, and are propagated by sowing their seeds upon a bed of fresh light earth; and when the plants come up, they should be thinned so as to leave them ten inches or a foot asunder, because their branches trail upon the ground, and if they have not room they are apt to overbear each other, and thereby are very often rotted, especially in moist seasons. The weeds should also be diligently cleared from them, otherwise they will grow over and destroy them. In June they will produce small yellow flowers, which are succeeded by pods so much like caterpillars, that a person at a small distance would imagine they were real

caterpillars feeding on the plants; and it is for this oddness of their pods that these plants are chiefly preserved. The first species is the best worth cultivating, the pods being larger and more visible than the others. These plants are cultivated more on account of their oddness than beauty.

2. Scorpiurus Muricata; *Two-flowered Caterpillar.* Peduncles two-flowered; legumes bluntly prickly outwards. This has the appearance, duration, and stature, of the preceding; differing only in having the peduncles two-flowered. —Native of the south of Europe.

3. Scorpiurus Sulcata; *Three-flowered Caterpillar.* Peduncles subtriflorous; legumes with distinct acute spines on the outside. This has slenderer stalks than either of the above. —Native of the south of Europe.

4. Scorpiurus Subvillosa. Peduncles mostly four-flowered; legumes with acute spines in clusters outwardly; stems striated, subvillose, procumbent.—Native of the south of Europe, and Barbary about Algiers.

Scorzonera; a genus of the class Syngenesia, order Polygamia-Æqualis. *Calix:* common imbricate, long, subcylindrical; scales about fifteen, scariose at the edges. *Corolla:* compound imbricate, uniform; corollets hermaphrodite, numerous, the outer a little longer; proper one-petalled, ligulate, linear, truncate, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* germen oblong; style filiform, length of the stamina; stigmas two, reflexed. *Pericarp:* none, except the calix, which is ovate, oblong, converging, and finally spreading and reflexed. *Seeds:* solitary, oblong, cylindrical, striated, shorter by half than the calix. *Pappus:* feathered; (according to Gærtner sessile, with chaffy and bristly rays mixed.) *Receptacle:* naked. Essential Character. *Calix:* imbricate, with scales scariose at the edges. *Pappus:* feathered, sessile. *Receptacle:* naked. All the species may be propagated by sowing their seeds in the beginning of April upon a spot of light fresh soil. The best method of sowing them is, to draw shallow furrows by a line about a foot asunder, into which the seeds should be scattered thinly, covering them over about half an inch thick with the same light earth; and when the plants come up, they should be thinned where they are too thick in the rows, leaving them at least six inches asunder. The weeds should be hoed down as often as is necessary, or they will cause the plants to grow up weak. If you wish to save the seeds, let some of the best plants remain in the places where they grew; and when their stems are grown to their height, they should be supported with stakes, to prevent their falling to the ground or breaking. In June they will flower, and about the beginning of August their seeds will ripen, when they should be gathered and preserved dry till the spring following for use.——The species are,

1. Scorzonera Tomentosa; *White Viper's Grass.* Stem simple; leaves ovate, nerved, tomentose, quite entire, sessile. Stem one or two feet high, round, striated, leafy, somewhat corymbose at the top, clothed, as is every part of the herb, with soft hoary down.—Grows in Armenia, in the Archipelago, and on the banks of the Don.

2. Scorzonera Humilis; *Dwarf Viper's Grass.* Stem almost naked, one-flowered; leaves broad, lanceolate, nerved, flat.—Native of the mountains of Switzerland.

3. Scorzonera Parviflora; *Small-flowered Viper's Grass.* Stems branched; leaves linear, ensiform, entire; ray of the corolla very short.—Native of Austria.

4. Scorzonera Hispanica; *Garden Viper's Grass,* or *Spanish Scorzonera.* Stem branched; leaves embracing, entire, serrulate. Root carrot-shaped, about the thickness of a finger, and covered with a dark brownish skin; it is white within, and has a milky juice; flowers bright yellow. The roots are boiled and eaten as carrots, and sometimes fried in butter: they are ready for use in autumn and winter.—Native of Spain, the south of France, Italy, Siberia, and the Levant.

5. Scorzonera Undulata; *Wavy-leaved Viper's Grass.* Stems linear-lanceolate, attenuated, tomentose, waved; stem somewhat branched.—Common in the parched ground of Tunis.

6. Scorzonera Graminifolia; *Grass-leaved Viper's Grass.* Leaves linear, ensiform, entire, keeled; root perennial, brown on the outside.—Native of Portugal, Italy, and Siberia.

7. Scorzonera Purpurea; *Purple-flowered Viper's Grass.* Leaves linear-subulate, channelled, three-sided; peduncles cylindrical; stalk taper, and branching at the top; flowers pale purple.—Native of the march of Brandenburgh, Austria, Carniola, Barbary, and Siberia.

8. Scorzonera Angustifolia; *Narrow-leaved Viper's Grass.* Leaves subulate, entire; peduncles thickened; stem villose at the base. This grows a foot and half high; the peduncle immediately under the flower is thicker than it is below, and the lower part of the stalk is hairy. The flower is yellow.—Native of the south of Europe and Siberia.

9. Scorzonera Hirsuta; *Hairy Viper's Grass.* Leaves linear, hirsute; stem one-flowered, hirsute.—Native of Apulia and Provence.

10. Scorzonera Resedifolia; *Spreading Viper's Grass.* Leaves whitish, tooth-pinnatifid, smooth; calices cartilaginous, with a whitish tip; stem erect. Biennial, flowering in June and July.—Native of the south of France.

11. Scornonera Calcitrapifolia. Lower leaves lyrate, with the segments oblong and mucronate, the upper pinnatifid.—Native of the kingdom of Tunis in Africa.

12. Scorzonera Laciniata; *Cut-leaved Viper's Grass.* Leaves linear, toothed, acute; stem erect; scales of the calices from spreading mucronate; root biennial.—Native of Germany, Switzerland, Austria, the south of France, Italy, and Spain.

13. Scorzonera Coronopifolia; *Buck's-horn Viper's Grass.* Leaves pinnatifid-laciniate, pubescent; stem almost naked, simple, one-flowered; root perennial, fusiform, in thickness from that of the little finger to the thumb.—Native of the mountains of Barbary.

14. Scorzonera Orientalis; *Levant Viper's Grass.* Leaves sinuate, toothletted, acute; stems one or two flowered.—Found in the Levant.

15. Scorzonera Taraxacifolia; *Dandelion-leaved Viper's Grass.* Leaves runcinate, petioled; scape branched, leafless; root perennial, fusiform, and white, and scarcely the thickness of one's little finger; flowers deep yellow.—Native of Bohemia, flowering from July to the end of August.

16. Scorzonera Tingitana; *Poppy-leaved Viper's Grass.* All the leaves runcinate and embracing; stem upright, smooth, branched. Annual.—Native of Barbary: found at Tangier in the clefts of rocks.

17. Scorzonera Dichotoma; *Dichotomous Viper's Grass.* Root-leaves runcinate; stem branched, dichotomous, almost leafless; flowers terminating, solitary.—Found in Tunis.

18. Scorzonera Picroides; *Various-leaved Viper's Grass.* Upper leaves embracing, quite entire; lower runcinate; peduncles scaly. Annual.—Native of the south of France, and of Barbary.

19. Scorzonera Pinnatifida. Leaves pinnatifid, half-embracing; panicle diffused, terminating.—Native of eastern Africa, near Mosambique.

Scotch Fir. See *Pinus.*

Scotch Grass. See *Panicum.*

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SCROPHULARIA SAMBUCIFOLIA — *Elder-leaved Figwort.*

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SCOLYMUS HISPANICUS — *Perennial Golden Thistle.*

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SERRATULA PRÆALTA — *Tall Saw-wort.*

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SCORPIURUS SULCATA — *Three-flowered Caterpillar.*

G. Doble sc.

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Screw Pine. See *Pandanus.*

Srew Tree. See *Helicteres.*

Scrophularia; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-cleft, permanent; segments shorter than the corolla, rounded. *Corolla:* one-petalled, unequal, reversed; tube globular, large, inflated; border five-parted, very small; segments, the two upper larger erect; two lateral, spreading a little; one lowest, bent back. *Stamina:* filamenta four, linear, declining, length of the corolla, of which two are later; antheræ twin. *Pistil:* germen ovate; style simple, situation and length of the stamina; stigma simple. *Periearp:* capsule roundish, acuminate, two-celled, two-valved; partition folded, constructed of the margin of the valves, bent in, opening at the top. *Seeds:* very many, small. *Receptacle:* roundish, insinuating itself into each cell. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Corolla:* subglobular, resupine. *Capsule:* superior, two-celled. The plants of this genus are propagated by seeds, which, if sown in spring, they seldom rise in the same season. Some of them may come up in autumn, and others in the following spring; but if they are sown in autumn soon after they are ripe, the plants will appear in the spring after. The seeds of most of the species may be sown in the place where the plants are to remain, for they are most of them hardy enough to bear the cold of our ordinary winters in the open air; and when they come up, they will require no other care but to thin them where they are too close, and keep them clear from weeds. In the second year the plants will flower, and produce ripe seeds, after which the biennials will die, but the others will continue some years.——The species are,

1. Scrophularia Marilandica; *Maryland Figwort.* Leaves cordate, serrate, acute, rounded at the base; stem obtuse, angular; footstalks connected by a hairy line. Root perennial, fibrous; flowers in bunches on the upper part of the stalk, greenish-brown.—Native of North America.

2. Scrophularia Nodosa; *Knobby-rooted Figwort.* Leaves cordate, acute, three-nerved at the base; stem acute-angled; root tuberous, granulate; flowers dark blood-red. It has the name *Figwort*, and formerly *Kernelwort*, from its knobbed roots; and *Brownwort*, from the brown tinge of the leaves. There are several varieties. The leaves of this plant have a strong rank smell, and a bitter taste, which seem to indicate considerable virtues. Country people cure their swine when troubled with the scab, by washing them with a strong decoction of these leaves. The roots and leaves of this plant are celebrated for their efficacy against inflammations, the piles, scrofulous swellings, and old ulcers. The juice of the root is an excellent sweetener of the blood; and either that, or a strong decoction of it, taken daily for a considerable length of time, is a good medicine for the evil and the scurvy, also for the itch, and all other eruptions and foulnesses of the skin, for which purposes it is both taken inwardly, and the affected parts frequently washed with a little of it made warm. Wasps resort greatly to the flowers. Goats eat the plant; but cows, horses, sheep, and swine, refuse it.—Native of Europe, in woods and hedges, flowering in July.

3. Scrophularia Aquatica; *Water Figwort.* Leaves cordate, petioled, decurrent, blunt: stem winged. Root perennial, fibrous; herb fetid, smooth. The leaves are recommended medicinally for the same purposes as those of the preceding: in taste and smell they are similar, but weaker. The disagreeableness of this plant when bruised, induces cattle generally to reject it; nevertheless both leaves and flowers are much resorted to by different kinds of insects. Bees and wasps collect much honey from the flowers, which continue a long time. There is a variety with variegated leaves. It has obtained the name of *Water Betony* from the resemblance of its leaves to those of the Wood Betony. Like the preceding species, it was formerly called Brownwort, and in Yorkshire, Bishop's-leaves.—Native of various parts of Europe, from England to Greece; by the sides of rivers, ponds, and wet ditches, flowering from June to September.

4. Scrophularia Auriculata; *Ear-leaved Figwort.* Leaves cordate, tomentose beneath, appendicled at the base; racemes terminating.—Native of Spain, Italy, and Algiers.

5. Scrophularia Lævigata; *Smooth Figwort.* Smooth: leaves cordate, obtusely tooth-gashed; raceme terminating, compound, leafless; stem upright, quite simple, a cubit high, four-cornered, from four decurrent lines.—Native of Barbary, on the mountains near Zowam.

6. Scrophularia Scorodonia; *Balm-leaved Figwort.* Leaves cordate, doubly serrate, tomentose beneath; raceme leafy. Root perennial, fibrous; leafy. Stem four-cornered, hairy, two to four feet high.—Native of Portugal, Italy, Tunis in Africa, Siberia, and Britain. Found in the island of Jersey; between the Port and St. Hilary; and near the sea-shore about St. Ives in Cornwall.

7. Scrophularia Altaica; *White-flowered Figwort.* Leaves cordate, ovate, doubly tooth-serrate; teeth tending towards the base; raceme compound, leafless. Root consisting of thick fibres, about a finger's length; stem sometimes single, and sometimes multiple.—Native of the Altaic mountains of Siberia.

8. Scrophularia Glabrata; *Spear-leaved Figwort.* Leaves oblong, lanceolate, cordate, doubly serrate, smooth; panicles racemed, terminating, trichotomous; stem suffruticose. Flowers of a deep blood-red.—It flowers in May; is a biennial plant, and a native of the Canary islands, and of the Cape of Good Hope.

9. Scrophularia Betonicifolia; *Betony-leaved Figwort.* Leaves cordate, oblong, toothed; teeth quite entire, those of the base deeper. Root perennial; stem two feet high, erect, four-cornered, subpubescent, purplish at the base; leaves all simple, rather large, acute, broad at the base; corolla dull purple.—Native of Portugal and Spain.

10. Scrophularia Meridionalis. Leaves oblong, serrate, smooth; peduncles one-flowered; stem quadrangular, herbaceous, with opposite branches.—Found in New Granada by Mutis.

11. Scrophularia Orientalis; *Hemp-leaved Figwort.* Leaves lanceolate, serrate, petioled; stem-leaves in threes; branch-leaves opposite; flowers drooping. Root perennial, creeping; stem with four or more acute angles, leafy; flowers greenish. It flowers in July and August.—Native of the Levant.

12. Scrophularia Frutescens; *Shrubby Figwort.* Leaves somewhat fleshy, sessile, even, recurved at the end. Stem perennial, shrubby, two or three feet high, branched, angular, smooth, purplish, leafy; corollas small, very dark purple, with the lateral segments white.—Native of Portugal.

13. Scrophularia Vernalis; *Yellow Figwort.* Leaves cordate, doubly serrate, pubescent; peduncles axillary, solitary, dichotomous; capsules acuminate. Root fibrous, biennial; stem about two feet high, with four or five angles; flower-stalks axillary; flowers numerous, pale yellow.—Native of Italy, the south of France, Switzerland, Austria, Denmark, England, and Wales. It has been met with about Bury in Suffolk; at Hemsted in Essex; about Newborough in Yorkshire; and at Gloddaeth in Caernarvonshire.

14. Scrophularia Arguta; *Slender Upright Figwort.* Leaves cordate, smooth, doubly serrate; panicles axillary, dichotomous; capsules acuminate. This differs from the preceding,

in having the stems and leaves smooth, with the flowers smaller and red. Annual, flowering in May and June.—It was found in the islands of Madeira and Teneriffe.

15. Scrophularia Trifoliata; *Three-leaved Figwort.* Leaves smooth; lower ternate, pinnate, obtuse; upper simple; peduncles subtriflorous, axillary. Stem about a foot high, scarcely branched, leafy, nearly smooth, thick, with four blunt angles; leaves opposite, stalked, fleshy, about two inches long; flowers two or three on each stalk; corolla half an inch long, pale yellow, with an orange or rose-coloured border.—Native of Corsica and Africa, on the borders of fields, and on the sea-coast. This and the next species are ornamental plants, and may be allowed a place in the pleasure-garden, where, when they are strong, they will make a good appearance during their continuance in flower, which is generally two months, unless the season prove very hot and dry. Their roots will remain many years, unless destroyed by very severe winters, so that it will be proper to put some of the plants in pots, sheltered under a common frame in winter; but as young plants flower stronger than the old ones, there should be a succession of them annually propagated by seeds.

16. Scrophularia Sambucifolia; *Elder-leaved Figwort.* Leaves interruptedly pinnate, cordate, unequal; raceme terminating; peduncles axillary, in pairs, dichotomous. Stem erect, four-cornered, from the decurrent petioles; flowers large, drooping; calix smooth, or slightly downy; corolla of a pale purplish tawny hue, with a greenish border; capsule the size of a small filbert, with a conical point. Perennial. It flowers from July to September.—Native of Portugal and Spain.

17. Scrophularia Canina; *Cut-leaved Figwort.* Leaves pinnatifid; racemes terminating, naked; peduncles bifid. Root annual; stem four-cornered.—Native of Switzerland, France, Italy, &c. This, and the nineteenth species, should be planted in a dry soil; for as they naturally grow upon rocks and old walls, if they are in good ground the plants will grow vigorous in summer, and thereby will be so replete with moisture as to be killed by ordinary frosts, or rotted by wet in winter; whereas in a poor soil they are seldom injured by the cold in England.

18. Scrophularia Mellifera; *Barbary Figwort.* Smooth: lower leaves pinnate; leaflets ovate, tooth-serrate; flowers axillary; bottom of the corolla nectariferous. Stem herbaceous, erect, from two to three feet in height, simple, four-cornered, with four decurrent lines, smooth, as is the whole plant. It flowers in July and August. Perennial.—Native of Barbary.

19. Scrophularia Lucida; *Shining-leaved Figwort.* Lower leaves bipinnate, somewhat fleshy, very smooth; racemes two-parted; stem round, straight, green.—Native of the Levant and Barbary. See the seventeenth species.

20. Scrophularia Coccinea; *Scarlet-flowered Figwort.* Leaves in fours, ovate; flowers whorled, spiked. Root biennial; stalks two feet high. The flowers are produced at the tip of the stalk, in roundish bunches, which are about the same size as those of the second species, but of a fine scarlet colour.—Found at La Vera Cruz in New Spain. This plant will not survive in the open air of our winters; but the seeds should be sown in pots in autumn, which may be sheltered under a common frame in winter, and in the spring plunged into a moderate hot-bed. When they are fit to remove, as many as are required should be planted into separate small pots, and plunged into a very moderate hot-bed, shading them from the sun till they have taken new root; after which they must be gradually hardened to bear the open air, whereinto they may be removed at the end of June, placing them in a sheltered situation, where they may remain till the end of September, to be then removed into shelter before the coming on of the morning frosts. In the winter, place them in a stove kept moderately warm, where they will thrive and produce flowers during the following summer.

21. Scrophularia Peregrina; *Nettle-leaved Figwort.* Leaves cordate, marked with lines, shining; peduncles axillary, two-flowered. Stem hexangular, two or three feet high. The flowers are of a dark red or purple colour; they appear in May and June, and the seeds ripen in July and August, after which the plants die. Root annual.—Native of Italy.

22. Scrophularia Hispida. Stem four-cornered, erect, hispid; leaves pinnate, doubly crenate, terminating; lobe cordate, very large; raceme compound, leafless.—Native of the clefts of the rocks on Mount Atlas.

23. Scrophularia Lanceolata. Leaves lanceolate, unequally serrate, acuminate, acute at the base; petioles naked; fascicles of the panicle corymbose; flowers greenish yellow.—Grows in the wet meadows and woods of Pennsylvania.

Scurvy Grass. See *Cochlearia* and *Soldanel.*

Scutellaria; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, very short, tubular; mouth almost entire, after flowering closed with a lid. *Corolla:* one-petalled, ringent; tube very short, bent backwards; throat long, compressed; upper lip concave, trifid, the middle little segment concave, emarginate, the side ones flat, sharpish, lying under the middle one; lower lip wider, emarginate. *Stamina:* filamenta four, concealed beneath the upper lip, of which two are longer; antheræ small. *Pistil:* germen four-parted; style filiform, situation and length of the stamina; stigma simple, curved in, acuminate. *Pericarp:* none; calix closed by a lid, helmet-shaped, doing the office of a capsule, three-sided, opening by the lower margin. *Seeds:* four, roundish. *Observe.* It is clearly distinguished from all others by the fruit alone; for the closed calix resembles a helmet both in the lid and crest. Essential Character. *Calix:* with an entire mouth; after flowering closed by a lid. These plants are all propagated by seeds: if sown in autumn soon after they are ripe, they will more certainly succeed than when they are sown in the spring. The seeds may either be sown where the plants are to remain, or in a border, to be afterwards removed. But as the first species does not bear transplanting well, unless removed when young, the seeds had better be sown where the plants are to stand. This should be on a dry warm border of poor earth, where they will live much longer, and make a better appearance, than on a rich soil, though they seldom continue more than two or three years. When the plants come up, they will require no other care but to thin them, and keep them clean from weeds. When the other sorts come up, and are fit to remove, they may be transplanted into a nursery-bed, at five or six inches' distance, where they may stand till autumn, keeping them clean from weeds; then transplant them into the borders of the flower-garden, where they are to remain.——The species are,

1. Scutellaria Orientalis; *Yellow-flowered Scull Cap.* Leaves gashed, tomentose beneath; spikes rounded, four-cornered. Stems shrubby, nearly a foot high, spreading on the ground, and dividing into small branches; leaves stalked, green above, white underneath; spikes rather short, composed of bright yellow very handsome flowers, with ovate brownish bractes. The whole herb is bitter. It flowers at the end of May, and there is commonly a succession of flowers for two months and upwards.—Native of the Levant and Barbary.

2. Scutellaria Albida; *Hairy Scull Cap.* Leaves subcordate, serrate, wrinkled, opaque; spikes directed one way;

bractes ovate; corolla downy, its upper lip entire.—Native of the Levant, and Cochin-china.

3. Scutellaria Alpina; *Alpine Scull Cap.* Leaves cordate, gash-serrate, crenate; spikes imbricate, rounded, four-cornered. Flowers pale violet colour, with a white upper lip.—Native of Switzerland, Silesia, Piedmont, and Cochin-china.

4. Scutellaria Lupulina; *Great-flowered Scull Cap.* Leaves cordate, gash-serrate, acute, smooth; spikes imbricate, rounded, four-cornered. Stems shrubby and trailing; flowers white or blue, sometimes yellowish-white, very large.—Native of Siberia and Tartary.

5. Scutellaria Lateriflora; *Virginian Scull Cap.* Leaves smooth, with a rugged keel; racemes lateral, leafy. This has very much the appearance of the preceding species, but is higher and larger, with wider leaves more deeply toothed, and smaller blue flowers.—Native of Virginia and Canada.

6. Scutellaria Galericulata; *Common Scull Cap.* Leaves cordate-lanceolate, crenate, wrinkled; flowers axillary. Root perennial, slender, jointed, white, and creeping; stems from one to two feet high, upright. The singular construction of the calix deserves minute attention. Dr. Withering remarks, in his *Arrangements*, that when the blossom falls off, the cup closes upon the seeds, which, when ripe, being still smaller than the cup, could not possibly open its mouth, or overcome its elastic force, as the down of the seeds does in the compound flowers, and must consequently remain without a possibility of escaping: but Providence has provided a method to discharge them; the cup grows dry, and then is divided into two distinct parts, and thus the seeds, already detached from the receptacle, fall to the ground. This plant has been given for the tertian ague, and is said to have proved beneficial where the fits were more obstinate than violent. The quantity was from one to two ounces of the expressed juice, or an infusion of a handful or two of the herb. In England however it has never been in use.—Native of Britain, and other parts of Europe, by the sides of ditches, ponds, and rivers; flowering in July and August.

7. Scutellaria Hastifolia; *Hastate-leaved Scull Cap.* Leaves quite entire, the lower hastate, the upper sagittate. Root creeping; stem quite simple, scarcely the length of the finger, with about seven joints.—Native of Sweden, on the coast; of Austria, Goritia, and Silesia.

8. Scutellaria Minor; *Small Scull Cap.* Leaves cordate-ovate, almost quite entire; flowers axillary. This is only one-fourth the size of the sixth species.—Native of England, France, Alsace, and Piedmont, on wet heaths and commons, in boggy ground, and at the edges of ponds in a gravelly soil. It is found on Hampstead heath, but in greater plenty on Putney thirley, Streatham, and other commons in Surry; on Lewesdon hill; in Goldmire near Dalton; on Seaman's moss, next to Altringham, Cheshire; and on Wareham heath in Purbeck, Dorsetshire.

9. Scutellaria Integrifolia; *Entire-leaved Scull Cap.* Leaves sessile, ovate, lower indistinctly serrate, upper quite entire. Stems two feet high, sending out many side-branches.—Native of North America.

10. Scutellaria Havanensis. Leaves cordate, ovate, crenate; flowers solitary, axillary; both lips of the corolla trifid. Flowers large, blue. A little tender herbaceous, branching plant, procumbent, with the branches rising. It flowers in December.—Native of the Havannah, on maritime rocks.

11. Scutellaria Hyssopifolia; *Hyssop-leaved Scull Cap.* Leaves lanceolate, dotted beneath.—Native of Virginia.

12. Scutellaria Purpurascens; *Purple Scull Cap.* Leaves petioled, cordate, ovate, toothed; racemes naked, terminating; both lips of the corolla trifid. Stems herbaceous, prostrate, a span high, simple, obscurely four-cornered, smooth; flowers blue.—Native of the West Indies.

13. Scutellaria Peregrina; *Florentine Scull Cap.* Leaves subcordate, serrate; spikes elongated, directed one way. Stem downy, two feet high; flowers purple or white.—Native of Italy and Siberia.

14. Scutellaria Indica. Leaves subovate, crenate, petioled; racemes almost naked. This species lies on the ground, and appears like Ground Ivy.—Native of China and Japan.

15. Scutellaria Altissima; *Tall Scull Cap.* Leaves cordate-oblong, acuminate, serrate; spikes almost naked, with numerous downy purple flowers.—Native of the Levant.

16. Scutellaria Cretica. Villose: leaves cordate, obtuse, and obtusely serrate; spikes imbricate; bractes setaceous.—Native of Crete or Candia.

17. Scutellaria Nervosa. Plant glabrous; leaves sessile, ovate, dentated, nervose; raceme terminal, lax, leafy; flowers blue.—Grows on the banks of rivulets, in Virginia.

18. Scutellaria Angustifolia. Plant simple, very slightly pubescent; leaves linear; flowers axillary, opposite.—Grows on the river Kooskoosky.

19. Scutellaria Parvula. Plant simple, dwarfish, very pubescent; leaves sessile, ovate, very entire; flowers axillary, solitary, small, pale blue.—This is a small plant, never above two inches high, and grows in Canada and the Illinois country. It has also been seen on the banks of rivers in Virginia.

20. Scutellaria Caroliniana. Plant branchy, very glabrous; leaves petiolate, linear-lanceolate, acute, very entire; racemes lax, leafy; calices obtuse; flowers yellowish-white, spotted at the apex with blue.—Grows in Carolina.

Scythian Lamb. See *Polypodium.*

Sea Bindweed. See *Convolvulus.*

Sea Buckthorn. See *Hippophæ.*

Sea Cabbage, or *Kale.* See *Brassica* and *Crambe.*

Sea Chumomile. See *Anthemis.*

Sea Chickweed. See *Glaux.*

Sea Colewort. See *Bunias.*

Sea Daffodil. See *Pancratium.*

Sea Heath. See *Frankenia.*

Sea Holly. See *Eryngium.*

Sea Lavender. See *Statice Lamonium.*

Sea Laurel. See *Phyllanthus*, and *Xylophylla.*

Sea Milkwort. See *Glaux.*

Sea Onion. See *Scilla.*

Sea Pea. See *Pisum.*

Sea Pink. See *Cerastium* and *Statice.*

Sea Purslane. See *Atriplex.*

Sea-side Grape. See *Coccoloba.*

Sea Pigeon Pea. See *Sophora.*

Seal, Solomon's. See *Convallaria.*

Secale; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* common receptacle toothed, lengthened out into a spike; glume two-flowered, two-valved; leaflets opposite, distant, erect, linear, acuminate, less than the corolla; florets sessile. *Corolla:* two-valved; outer valve more rigid, ventricose, acuminate, compressed; keel ciliate, ending in a long awn; inner valve flat, lanceolate. Nectary two-leaved; leaflets lanceolate, sharpish, ciliate, gibbous on one side at the base. *Stamina:* filamenta three, capillary, hanging out of the flower; antheræ oblong, forked. *Pistil:* germen turbinate; styles two, reflexed, villose; stigmas simple. *Pericarp:* none, except the permanent corolla, which embraces the seed, gapes, and drops it. *Seed:* one, oblong, semicylindrical, naked, pointed at one end. *Observe.* There is frequently a third floret, which is peduncled, between the two larger sessile ones. It is somewhat difficult to dis-

tinguish this genus from *Triticum*. Essential Character. *Calix:* two-valved, solitary, two-flowered, on a toothed elongated receptacle.——The species are,

1. Secale Cereale; *Rye*. Ciliæ of the glumes rugged. Root annual; stem higher and weaker than Wheat, sometimes attaining the height of six feet; leaves a quarter or a third of an inch in breadth, rough to the touch if the finger be drawn from point to base, but not hairy: they are wider, and form a more considerable tuft, than Wheat commonly does. Spike very close, of a gray colour from its pubescence, in a good soil and situation having four rows, containing from sixty to eighty, and sometimes 120 grains, smaller and slenderer than Wheat. Rye is esteemed the least nourishing of all the common grains: it is more susceptible of fermentation, and in a slight degree laxative. It is used principally for making bread in our northern counties, either alone or mixed with wheat; and also for extracting an ardent spirit. In the Limosin, a province of France, it is used with great success for fattening oxen, after they have had a summer's grass, and have been put to Turnips, at the end of October or the beginning of November. When the Turnips fail, they mix the flour with water to the consistency of a paste, and leave it three, four, or five days, to ferment and become sour; they then dilute it with water, and add cut hay to the whole. Some mix leaven with the paste, to secure a fermentation; but it is never used till quite sour. The cattle have it three times a day; twenty-two pounds for each large ox. Some say that Rye is a native of Crete, and others of Siberia; but there is no reason to think that there is any country in which it is found wild. It flowers in June, and the grain is ripe in England about the middle of July.—Farmers distinguish the two varieties by the titles of Winter and Spring Rye, but when these are sown three or four years at the same season, and on the same soil, it will be difficult to know them asunder. Where Rye is sown upon a warm land, it will ripen much earlier than upon cold stiff ground, and by continuing it for two or three years, it will be forwarded so much, as to ripen a month earlier than the seeds which have long grown upon a strong cold soil; so those who are obliged to sow Rye toward spring, generally provide themselves with this early seed. The Common or Winter Rye is what most farmers grow: it is usually sown at the same time as Wheat, and mixed with it in many of the northern counties. This mixture however is bad husbandry, as the Rye will always ripen sooner than Wheat; so that if the latter be permitted to be fully ripe, the former will shatter. It is generally sown two bushels and a half to the acre, upon poor dry gravelly or sandy land, where Wheat will not thrive, and may answer very well in such places, but should not be grown where the land will bear Wheat, as the value of Rye is greatly inferior. When it is sown, the ground should not be too wet; and if much rain should fall before it comes up, it will probably rot in the ground, but will not be long in making its appearance, being much sooner out of the ground than Wheat. The small Rye may be sown in the spring, about the same time as Oats, and is usually ripe as soon as the other sort; but in wet seasons it is apt to run much to straw, and then the grain is generally lighter than the other; so the only use of this sort is to sow upon lands where the autumnal crop may have miscarried. It is also sown in autumn, to afford green feed for ewes and lambs in the spring, before there is plenty of grass. This should be done early in autumn, that it may have strength to furnish early seed. Its great use is to supply the want of Turnips where they have failed, as also after the Turnips are over, and before the grass is enough grown to afford green feed for the ewes: hence, in those cold seasons, when the Turnips in general fail, it is very good husbandry to sow the land with Rye, especially where there are flocks of sheep, which cannot well be supported early in the spring when green feed is wanting: therefore those farmers who have large live-stocks, should have several methods of supplying themselves with sufficient feed, lest some should fail, for as Turnips are a very precarious crop, some land should be sown with Cole-seed, which will supply the want of Turnips in winter; and if some of the ground, which was sown late with Turnips that failed, was sown in the autumn with Rye, that would be fit to supply the want of Cole-seed afterward. Spring Rye produces a less crop of smaller lighter grain than Winter Rye; it is also esteemed less nourishing, and the bread made of it is of a darker colour. As a grain, for making bread, Rye is sown to a much greater extent in Germany, Switzerland, and the northern and Alpine countries, than in England. In cold and moist valleys among the mountains, it is their most useful crop, and in many places the chief resource of the hardy inhabitants.

2. Secale Villosum; *Villose Rye Grass*. Ciliæ of the glumes villose; calicine scales wedge-shaped.—This annual Grass is a native of the south of Europe, and the Levant.

3. Secale Orientale; *Oriental Rye Grass*. Glumes hirsute; calicine scales awl-shaped.—Native of the Archipelago.

4. Secale Creticum; *Cretan Rye Grass*. Glumes ciliate on the outside.—Native of Candia or Crete.

Sechium; a genus of the class Monœcia, order Monadelphia. —Generic Character. *Male Flowers. Calix:* perianth one-leafed, half five-cleft; tube bell-shaped, spreading; segments of the border lanceolate, flat, acuminate, spreading very much. *Corolla:* one-petalled; tube the size and figure of the calix, adhering to it; segments of the border five-cleft, ovate, flat, acute, spreading, nearly twice as long as the calix. Nectary ten hollows in the upper part of the tube of the corolla. *Stamina:* filamenta five, connected into an upright cylinder, five-cleft at top, spreading very much; antheræ on the top of each filamentum a line, creeping twice downwards, and once upwards, polliniferous. *Females on the same plant. Calix:* as in the male, placed on the germen by a pedicel, deciduous. *Corolla:* as in the male, but the hollows or pits bigger. *Pistil:* germen obovate, tomentose, five-grooved, superior; style cylindrical, erect, length of the calix; stigma very large, peltate, reflexed, with the margin five-cleft. *Pericarp:* apple very large, ovate, turbinate, five-grooved, fleshy, unequally gibbous at the top, furnished with harmless prickles, one-celled above. *Seed:* one, sub-ovate, plano-compressed, fleshy, bilamellate, blunt at each end. Essential Character. *Male. Calix:* half five-cleft. *Corolla:* five-cleft, with ten hollows in the upper part of the tube. *Filamenta:* five, connected. *Female. Stigma:* very large, peltate, reflexed, five-cleft. *Pericarp:* large, ovate-turbinate, one-seeded.——The single species known is,

1. Sechium Edule; *The Chocho Vine*. Stem herbaceous, climbing or procumbent, greatly divaricated, roundish, striated, smooth, thick; leaves cordate-angular, rugged on the upper surface, with the angles toothed and acute, alternate, on a smooth petiole; flowers small, without scent; corollas yellow. The fruit is green and shining on the outside, white and fleshy within, differing in size, and singular in structure. Although the moisture of the fruit itself be sufficient to make the seed vegetate, and to afford it nutriment, until the fibres reach the soil, and imbibe nutriment from thence; yet the people of the country bury it in the ground, probably to accelerate the growth, or to insure it with greater certainty; it will however grow if it fall on the ground, or even if it be preserved any where. In the island of Cuba, they eat it in

their soup, or pudding, or boiled with their meat constantly. Browne says, that the fruit is sometimes boiled in Jamaica, and served up at table by way of greens, in which state it is generally looked upon as wholesome and refreshing; but it is too insipid to be much liked. The apples serve to fatten the hogs in the mountains and inland parts, where the plant is mostly cultivated. There are two varieties of this plant found in Cuba.—Native of the West Indies, flowering and fruiting in December.

Securidaca; a genus of the class Diadelphia, order Octandria.—Generic Character. *Calix:* perianth three-leaved, small, deciduous; leaflets ovate, coloured, the uppermost respecting the standard, and two the keel. *Corolla:* papilionaceous, five-petalled; wings spreading wide, and very blunt; standard two-leaved, oblong, straight, connate with the keel at the base, reflexed at the tip; keel length of the wings, subcylindrical, with the limb or border wider, augmented by a plaited blunt appendicle. *Stamina:* filamenta eight, connate at bottom; antheræ oblong, erect. *Pistil:* germen ovate, ending in an awl-shaped style; stigma flat, widening, toothed at the tip. *Pericarp:* legume ovate, one-celled, ending in a ligulate wing. *Seed:* one, oblong. Essential Character. *Calix:* three-leaved. *Corolla:* papilionaceous, with the standard two-leaved, within the wings. *Legume:* ovate, one-celled, one-seeded, ending in a ligulate wing.——The species are,

1. Securidaca Erecta; *Upright Securidaca.* Stem upright; leaves oblong. This is an upright tree, twelve feet high, with a few long slender weak branches; flowers in racemes, purple.—Native of Martinico, &c. flowering there in April.

2. Securidaca Volubilis; *Climbing Securidaca.* Stem climbing; leaves oblong, acute. A twining shrub.—Native of South America and the West Indies.

3. Securidaca Virgata. Stem climbing; branches rod-like; leaves roundish.—Native of Jamaica and Hispaniola.

Sedge. See *Carex* and *Schœnus.*

Sedum; a genus of the class Decandria, order Pentagynia.—Generic Character. *Calix:* perianth five-cleft, acute, erect, permanent. *Corolla:* petals five, lanceolate, acuminate, flat, spreading; nectaries five, each at a very small emarginate scale, inserted into each germen at the base, on the outside. *Stamina:* filamenta ten, awl-shaped, length of the corolla; antheræ roundish. *Pistil:* germina five, oblong, ending in more slender styles; stigmas obtuse. *Pericarp:* capsules five, spreading, acuminate, compressed, emarginate towards the base, opening on the inside longitudinally by a suture. *Seeds:* numerous, very small. Essential Character. *Calix:* five-cleft. *Corolla:* five-petalled. *Scales:* nectariferous, five, at the base of the germen. *Capsules:* five.——The species are,

1. Sedum Verticillatum; *Whorled Stonecrop.* Leaves in fours; stem a foot high, erect, round. Native of the most southern parts of Europe, and of Siberia.—All the Stonecrops are easily propagated by planting their trailing stalks, either in spring or summer, which stalks soon put out roots; but as they thrive much better upon rocks, old walls, or buildings, than in the ground, they may be disposed upon rock-work in such a manner as to have a good effect; and where there are unsightly buildings, their tops may be covered with these plants, so as to hide their deformity. If the cuttings or roots of the perennial sorts be planted in some soft mud, laid upon the walls or buildings, they will soon take root, and then spread into every joint or crevice, and cover the place: or if the seeds of those annual sorts, which grow naturally in dry places, be sown soon after they are ripe, on the top of walls, the plants will come up, and maintain themselves without further care.

2. Sedum Telephium; *Orpine Stonecrop.* Leaves flattish, serrate; corymb leafy; stem erect; root perennial, tuberous. This is the only English species with flat leaves. Being a handsome plant, and easily cultivated, it is met with in most gardens, where it will sometimes grow a yard high. The flowers vary in colour, and the plants in size.—The Common White and Purple are common in most parts of Europe, Japan, and Siberia; on old walls, by the side of woods, in hedges, among bushes in pastures, in fields, in vineyards, chiefly in a chalky or sandy soil, flowering in July and August. The Purple-flowering Orpine is the most common in Britain. The name is from the French: it was also called *Live-long,* because a branch of it, hung up, will keep its verdure a long time. It is of a styptic astringent nature, and the roots contain the principal virtues. They are excellent in those fluxes and loosenesses which erode the bowels, for which purposes they are best given in powder, a scruple or somewhat more of which is a sufficient dose. Bruised and applied externally, they are serviceable to wounds, burns, and bruises. The leaves boiled in milk, and the decoction taken to the amount of a large tea-cupful, three or four times a day, powerfully promotes the urinary discharge, and has been found serviceable for the piles and other hæmorrhages. Cows, goats, sheep, and hogs, eat it, but horses refuse it.—The Orpines may be easily increased by cuttings during the summer months, or by parting their roots, either in spring or autumn. They thrive best in a dry soil, and a shady situation; but may also be planted for the same purposes as the other species, especially the next species, which is evergreen.—This plant occurs near London, about Charlton, Shooter's Hill, Norwood, &c.; at Shelford and Burrough-Green, in Cambridgeshire; at Aspley wood in Bedfordshire; Headington Wick Copse, and Shotover hill, Oxfordshire; frequently in Suffolk; near Ashburne in Derbyshire; Malvern Chace; about Manchester; near Shrewsbury; at Tettenhall in Staffordshire; at Castle Dikes, and Preston woods, in Northamptonshire; and two miles to the eastward of Dumbarton, between that place and Glasgow, in Scotland.

3. Sedum Anacampseros; *Evergreen Orpine.* Leaves wedge-shaped, attenuated at the base, subsessile; stems subdecumbent; flowers in corymbs; root fibrous, perennial.—Native of Germany, Switzerland, the Valais, the south of France, Italy, China, Cochin-china, and Japan, growing out of the crevices of rocks. The stalks of this species hang down, and have a very good effect in rock-work; and the plants require no care, for when they are fixed in the place, they will spread and propapate fast enough.

4. Sedum Divaricatum; *Spreading Stonecrop.* Leaves wedge-rhombed, emarginate, petioled; stems branched; panicles terminating, spreading.—This species is shrubby, flowers in June and July, and is a native of Madeira.

5. Sedum Aizoon; *Yellow Stonecrop.* Leaves lanceolate, serrate, flat; stem erect; cyme sessile, terminating; flowers bright yellow. It flowers from July to September.—Native of Siberia.

6. Sedum Hybridum; *Germander-leaved Stonecrop.* Leaves wedge-shaped, concave, somewhat toothed, aggregate; branches creeping; cyme terminating.—Native of Tartary, at the foot of the Aralian mountains.

7. Sedum Populifolium; *Poplar-leaved Stonecrop.* Leaves flat, cordate, toothed, petioled; corymbs terminating. When the plant grows in an open sunny situation, the leaves and stalks become of a bright red colour. It is the only hardy plant of this genus, cultivated with us, that has a shrubby stalk; the leaves are deciduous. It flowers in July and August, and is proper for a rock plant.—Native of Siberia.

8. Sedum Stellatum; *Starry Stonecrop.* Leaves flattish, angular; flowers lateral, sessile, solitary: they are of a delicate white colour, each petal marked longitudinally with a pink line. This is a low annual plant.—Native of Germany, France, Switzerland, Italy, and of China.

9. Sedum Alsinefolium; *Chickweed-leaved Stonecrop.* Leaves flat, ovate; stem panicled; petals obtuse.—Native of Piedmont, in shady stony places.

10. Sedum Cepola; *Purslane-leaved Stonecrop.* Leaves flat, lanceolate; stem branched; flowers panicled; petals acute, awned; root annual.—Native of Germany, France, Switzerland, and Italy.

11. Sedum Libanoticum. Root-leaves in bunches, spatulate lanceolate; stem almost naked, quite simple.—Native of Palestine.

12. Sedum Dasyphyllum; *Thick-leaved Stonecrop.* Leaves opposite, ovate, obtuse, fleshy; stem weak; panicle glutinose. Root perennial, composed of small white fibres; stems decumbent, creeping, branched, tufted, thread-shaped, a little viscid; flowering-branches erect; leaves tipped with red; flowers three or four together, white with a purple streak, forming small spreading panicles. This pretty plant, introduced into a garden, propagates itself freely upon walls, in waste places, and about garden-pots. No plant is better adapted for decorating rock-work; upon rocks or walls it grows without any trouble, in any aspect, multiplying very much by young shoots, and looking beautiful throughout the year. Linneus marks it as annual: Dr. Smith has sometimes thought it biennial, but he rests in supposing it to be perennial; frequently, however, disappearing in one spot, and re-appearing in other.—Native of many parts of Europe. In England found near London, on walls near Chelsea Hospital; between Kensington gravel pits and Acton; also at Hammersmith and Kew; at Fulbourne in Cambridgeshire; Marketstreet, in Bedfordshire; at Bugden, in Huntingdonshire; at Malton in Yorkshire, and at Clifton near Bristol.

13. Sedum Reflexum; *Yellow Stonecrop.* Leaves awl-shaped, scattered, loose at the base, the lowermost recurved; flowers in cymes. Root perennial. Haller says it is eaten in salads, in various parts of Europe.—It is common in England on walls and thatched roofs, and on rocks in the northern counties, flowering in July.

14. Sedum Hispidum; *Hispid Stonecrop.* Branches filiform, panicled, villose; leaves half round. Annual.—Native of Barbary.

15. Sedum Rupestre; *Rock Stonecrop.* Leaves thick, awl-shaped, erect, clustered, in five rows, loose at the base; flowers subcymed. Perennial. This also is cultivated in Holland and Germany, to mix with salads, notwithstanding its acrid taste.—Native of various parts of Europe. Found in England on St. Vincent's rocks, near Bristol; on the Chedder rocks in Somersetshire; on some walls about Darlington.

16. Sedum Saxatile; *Mountain Stonecrop.* Leaves scattered, half round, obtuse, loose at the base; stem branched, decumbent; root annual.—Found on rocks in Norway, Germany, Switzerland, and Dauphiny.

17. Sedum Quadrifidum; *Four-petalled Stonecrop.* Leaves scattered, round, obtuse; stem simple; flowers umbelled, four-petalled, yellow. Perennial.—Native of the northern parts of Asia, on rocks.

18. Sedum Hispanicum; *Spanish Stonecrop.* Leaves linear, round, depressed, scattered; cymes patulous; flowers six-petalled; root slender, fibrous, perennial. It flowers in July.—Native of Spain and Carinthia.

19. Sedum Lineare; *Linear Stonecrop.* Leaves round, linear, opposite; cyme trifid.—Native of Japan.

20. Sedum Cœruleum; *Blue Stonecrop.* Leaves oblong, alternate, obtuse, loose at the base; cyme bifid, smooth.—Found in Africa.

21. Sedum Album; *White Stonecrop.* Leaves oblong, round, blunt, spreading, smooth; panicle very much branched. Root perennial, fibrous; stems a span high, round, leafy, branched, smooth, decumbent at the base; leaves fleshy, and very juicy; panicle terminal; flowers white or reddish. Haller informs us, that this species possesses all the virtues of the Large Houseleek, and that he has used the juice of it in uterine hæmorrhages. By way of cataplasm, it is applied to the piles when in a painful state. Some persons prepare and eat it as a pickle.—Native of Europe, on rocks, walls, and roofs, flowering in July. It occurs in the neighbourhood of London; between Bromley and Bromley Hall in Middlesex; on walls at Peterborough; upon the rocks above Great Malvern; at Wick cliffs; at Chatterness in the Isle of Ely; and at Stevington and Sharnbrook in Bedfordshire.

22. Sedum Acre; *Biting Stonecrop*, or *Wall Pepper.* Leaves alternate, subovate, fleshy, gibbous, adnate, sessile; cyme trifid, leafy. Root perennial, fibrous. Stem tufted, branched, decumbent, smooth, round, leafy; leaves protuberant at the back; flowers erect, golden-coloured, in terminal, solitary panicles. It grows suspended in the open air, or in a room, which has been considered as a proof that it receives its nourishment principally from the air; but it is justly observed by Withering, that though the life of the plant be thus retained for some weeks, yet it is at the expense of the juices, which its succulent leaves had previously imbibed. At the end of three weeks, a plant, suspended before a window with a northern aspect, had lost about half its weight, though it had put out some fine fibres from the root, and had yet life enough to enable it to turn to the light, after having been purposely turned from it. After being kept in water for twenty-four hours, it regained more than half of what it had lost. Hence it appears, that the succulent leaves are reservoirs which support the plant in dry weather, and are again replenished in rainy seasons; but it does not follow that such plants attract nourishment from the air more than others, though it must be allowed that they subsist much upon the humidity of the atmosphere, since their succulent stems and leaves cannot derive much nutriment from the arid soil in which they generally grow. The whole of this plant is acrid, and when chewed in the mouth has a very hot biting taste, whence, and from its common place of growth, it has the name of Wall Pepper. Applied to the skin, it blisters; and taken inwardly, it excites vomiting. In scorbutic cases, it is an excellent medicine, under proper management. For this purpose, a handful of the herb is directed to be boiled in eight pints of beer till they are reduced to four, of which three or four ounces are to be taken every morning. Milk has been found to answer this purpose better than beer. Not only ulcers simply scorbutic, but those of a scrofulous or even cancerous tendency, have been cured by the use of this plant. It is likewise useful as an external application in destroying fungous flesh, and in promoting a discharge in gangrenes and carbuncles. Another effect for which this plant has been esteemed, is that of stopping intermitting fevers.—Native of Europe, in dry sandy and gravelly pastures, on houses, walls, banks, and rocks. It is common in England; flowers in June; and, if planted in a pot, will hang over the sides and cover the pot completely.

23. Sedum Sexangulare; *Insipid Stonecrop.* Leaves subtern, roundish, obtuse, fleshy, adnate, sessile, spreading; cyme trifid, leafy. The flowers are of a palish yellow colour. The herb, though unpleasantly austere, is not acrid.—Native

of several parts of Europe, on walls, roofs, and dry pastures, flowering at the end of June. Found in England on Greenwich Park wall; near Northfleet, Sheerness, and in the isle of Shepey; near Trinity Conduit Head; between Cambridge and Madingley; and on Ely Minster.

24. Sedum Anglicum; *English* or *Mild-white Stonecrop.* Leaves subalternate, ovate, fleshy, gibbous, adnate, sessile; cyme bifid, even. Root annual, fibrous; stems tufted, decumbent at the base, smooth, ruby-coloured, leafy. This has been confounded with the next species.—Native of Norway and Great Britain, on rocks, sandy coasts, roofs, and walls; on the sandy downs of the Norfolk and Suffolk coast, plentifully; as well as in Devonshire, Dorsetshire, Cornwall, Wales, and Scotland; and on the mountains of Westmoreland and Lancashire.

25. Sedum Annuum; *Annual Stonecrop.* Stem erect, solitary, annual; leaves ovate, sessile, gibbous, alternate; cyme recurved; root annual, fibrous.—Native of the north of Europe.

26. Sedum Pubescens; *Pubescent Stonecrop.* Pubescent: leaves oblong, obtuse, flattish above; cyme bifid; petals lanceolate; root annual.—Found in the clefts of rocks in the kingdom of Tunis.

27. Sedum Villosum; *Hairy Stonecrop.* Leaves alternate, linear, flattish, somewhat hairy, as are also the peduncles; stem erect; root perennial, small, fibrous. It flowers in June and July.—Native of Britain, Germany, France, Italy, Switzerland, and Denmark: it occurs in the bogs and moist meadows of the northern parts of this island.

28. Sedum Nudum; *Naked Branched Stonecrop.* Leaves scattered, oblong, cylindrical, blunt; stems shrubby, very much branched; branches twisted; cymes terminating.—Native of Madeira.

29. Sedum Pusillum. Plant erect, glabrous; leaves alternate, somewhat round, oblong; flowers at the summit fewer, alternate, subpedicellate, white, with eight stamina.—Grows in North Carolina and Virginia.

30. Sedum Pulchellum. Plant glabrous; stems assurgent; leaves scattered, linear, obtuse; cyme polystachyous; flowers sessile, octandrous, purple.—Grows on rocks, and the trunks of decayed trees, from Virginia to Georgia, and on the banks of the Ohio, &c.

31. Sedum Stenopetalum. Plant glabrous; stems assurgent; leaves scattered, heaped, adnate-sessile, compressed-subulate, acute; cyme terminal, trichotomous, dichotomous; spikes recurved; flowers sessile, decandrous, golden yellow; petals linear, much longer than the calix.—Grows on rocks on the banks of Clarck's river and Kooskoosky.

32. Sedum Ternatum. Plant small, creeping; leaves plain, round-spathulate, tern; cyme subtristachyous; flowers sessile, white, octandrous; centre decandrous.—An elegant little species, growing on rocks in the western parts of Pennsylvania, Virginia, and Carolina.

33. Sedum Telephioides. Leaves plain, oval, subacute on both sides, dentated; corymb fasciculate; flowers pale purple.—Grows on rocks on high mountains, in Virginia and Carolina.

Seguieria; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, spreading; leaflets oblong, concave, coloured, permanent. *Corolla:* none, unless the calix be taken for it. *Stamina:* filamenta very many, capillary, spreading, longer than the calix; antheræ oblong, flattish. *Pistil:* germen oblong, compressed, at top membranaceous, with one side thicker; style very short, at the thicker side of the germen; stigma simple. *Pericarp:* capsule oblong, augmented by a very large wing, on the straighter side thicker, with three little wings on each side at the base, one-celled, not opening. *Seed:* one, oblong, smooth. Essential Character. *Calix:* five-leaved. *Corolla:* none. *Capsule:* one-seeded, terminated by a large wing, and having small lateral ones. *Seed:* solitary.——The species are,

1. Seguieria Americana. Stem climbing, prickly; leaves lanceolate, emarginate; racemes branched, leafy. This shrub is about twelve feet high.—Native of South America, in woods and coppices about Carthagena, especially by waysides, flowering in September.

2. Seguieria Asiatica. Stem scandent, unarmed; leaves ovate, quite entire; racemes long, axillary, and terminating.—Native of Cochin-china, in woods.

Selago; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, four-cleft or five-cleft, small, permanent; lower segment larger. *Corolla:* one-petalled; tube very small, filiform, scarcely perforated; border spreading, five-parted, almost equal, the two upper segments smaller, the lowest larger. *Stamina:* filamenta four, capillary, length of the corolla, into which they are inserted, the two upper ones longer; antheræ simple. *Pistil:* germen roundish; style simple, length of the stamina; stigma simple, acute. *Pericarp:* none, except the corolla involving the seed. *Seed:* one or two, roundish. Essential Character. *Calix:* four-cleft. *Corolla:* tube capillary; border almost equal. *Seed:* one or two.——The species are,

1. Selago Corymbosa; *Fine-leaved Selago.* Corymb manifold; flowers disjointed; leaves filiform, fascicled; stems slender, woody. This plant is preserved in gardens more for the sake of variety than beauty; for the branches grow very irregular and hang down, and both leaves and flowers are small.—Plant cuttings during any of the summer months in a bed of fresh earth, covering them close with a bell or hand glass, shading them from the sun, and refreshing them now and then with water. Harden them gradually, and then transplant them into small pots, placing them in the shade till they have taken root. Place them with other hardy green-house plants, and about the end of October remove them into the dry-stove. They only require protection from frost, and may be treated in the same manner with the hardier green-house plants. These directions apply to all the following species.

2. Selago Polystachya; *Many-spiked Selago.* Corymb with spikes, fascicled; leaves filiform, aggregate; stem suffruticose, erect; flowers white.—Native of the Cape.

3. Selago Rapunculoides; *Rampion-like Selago.* Spikes corymbed; leaves toothed; root long, creeping, fibrous.—Native of the Cape.

4. Selago Spuria; *Linear-leaved Selago.* Spike corymbed; leaves linear, toothletted; flowers violet-coloured. Biennial, flowering in June.—Native of the Cape.

5. Selago Fasciculata; *Cluster-flowered Selago.* Corymb manifold; leaves obovate, smooth, serrate; stem quite simple, erect, even, two feet high; corolla purple; stigma blunt.—Native of the Cape.

6. Selago Coccinea; *Scarlet Selago.* Spikes corymbed; lower leaves linear, quite entire, upper lanceolate-subulate, somewhat toothed; corollas very deep purple, with the outer segments larger.—Native of the Cape.

7. Selago Capitata; *Headed Selago.* Head terminating; leaves fascicled, linear, fleshy, smooth; stem suffruticose, erect, pubescent.—Native of the Cape.

8. Selago Fruticosa; *Shrubby Selago.* Heads roundish, terminating; leaves scattered, linear-obtuse, quite entire; stem shrubby.—Native of the Cape.

9. Selago Divaricata; *Spreading Selago.* Heads terminating; leaves filiform, linear, fascicled, smooth.—Native of the Cape.

10. Selago Canescens; *Hoary Selago.* Spikes terminating; leaves filiform, fascicled, smooth.—Native of the Cape.

11. Selago Geniculata; *Jointed Selago.* Spikes terminating; leaves linear, fascicled, smooth, with the margin bent back.—Native of the Cape.

12. Selago Triquetra; *Three-sided Selago.* Spikes terminating; leaves three-sided, imbricate, recurve, reflex, smooth.—Native of the Cape.

13. Selago Hispida; *Hispid Selago.* Spikes terminating; leaves linear, scattered, reflex, hispid.—Native of the Cape.

14. Selago Polygaloides; *Milkwort-like Selago.* Spikes terminating; bractes and calices keeled; laminæ rugged; leaves linear, smooth, with a reflex margin.—Native of the Cape.

15. Selago Cinerea; *Ash-coloured Selago.* Corymb compound; leaves linear, fascicled, smooth, reflex at the edge.—Native of the Cape.

16. Selago Rotundifolia; *Round-leaved Selago.* Corymb compound; leaves ovate, smooth, obtuse.—Native of the Cape.

17. Selago Ciliata; *Fringed Selago.* Flowers in spikes; leaves ovate, ciliate, acute.—Native of the Cape.

18. Selago Verbenacea; *Vervain Selago.* Spikes fascicled; leaves oblong, smooth; stem four-cornered, right-angled.—Native of the Cape.

19. Selago Hirta; *Rough-haired Selago.* Spikes very long; leaves obovate.—Native of the Cape.

20. Selago Ovata; *Ovate-headed Selago.* Spikes strobiline, ovate, terminating; leaves scattered, linear; stem shrubby; they are slender, hairy, and branched; flowers white, with a yellow spot on the two uppermost segments, and sometimes on all of them, and an orange spot at the mouth of the tube. This plant is valuable, not so much on account of its beauty, as the curious structure of its spikes, and its fragrancy. The flowers appear in June and July.—Native of the Cape.

Self-heal. See *Prunella.*

Selinum; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal manifold, spreading, flat; partial similar. Involucre universal many-leaved; leaflets lanceolate, linear, reflex; partial similar, spreading, length of the corollet. Perianth proper scarcely observable. *Corolla:* universal uniform; florets all fertile; partial, of five cordate equal petals. *Stamina:* filamenta five, capillary; antheræ roundish. *Pistil:* germen inferior; styles two, reflex; stigmas simple. *Pericarp:* none; fruit compressed, flat, oval, oblong, striated in the middle on both sides, bipartite. *Seeds:* two, oval-oblong, flat on both sides, striated in the middle, with the sides membranaceous. *Observe.* The seeds vary in form; and the involucres in number of leaflets. Essential Character. *Petals:* cordate, equal. *Involucre:* reflex. *Fruit:* oval-oblong, compressed, flat, striated in the middle.—The plants of this genus are easily propagated by seeds sown in the autumn. They are to be treated in the same way as *Angelica,* which see.——The species are,

1. Selinum Sylvestre; *Wild Selinum.* Stem even; root fusiform, manifold; herb milky.—Native of Denmark, Germany, Silesia, France, and Piedmont.

2. Selinum Palustre; *Marsh Selinum.* Stem striated; root almost simple; rays of the umbel hispid. Root subfusiform, thick, branching, yellowish without, white within. The whole plant, when wounded, pours forth a milky, thick, bitter, fetid juice, as thick as cream, which soon dries to a brownish resin. It flowers in July.—Found in swamps and on moors in the north of Europe, Germany, Austria, Dauphiny, and Piedmont; indigenous of England, found plentifully in the low wet moors near Whitgift, Yorkshire, four miles from the confluence of the Ouse and Trent; at Weel carr, and other wet places near Beverley; in Alder swamps, near Yarmouth; between Norwich and Higham, towards the river; and near Prickwillow bank in the isle of Ely.

3. Selinum Austriacum; *Austrian Selinum.* Stem grooved; universal involucre many-leaved; leaflets wedge-form, gashed. Root perennial, at the beginning of autumn pouring out a moderate quantity of yellowish-white milk.—Native of Austria, Idria, and the south of Europe.

4. Selinum Sibiricum; *Siberian Selinum.* Leaves tripinnate; universal and partial involucres colourless, nine-leaved. Root biennial, fusiform. It has the smell of a fresh carrot-root, and has a singular appearance on account of the white involucrets entirely involving the umbellets before they are completely unfolded. Stem erect, three feet high, hollow, striated, glaucous.—Native of Siberia.

5. Selinum Caruifolia; *Caraway-leaved Selinum.* Stem grooved, acute, angled; universal involucre none; leaflets lanceolate, gashed, callose, mucronate at the top. Root perennial. It flowers in July and August.—Native of Denmark, Germany, Switzerland, Austria, and Siberia.

6. Selinum Chabræi; *Carrot-leaved Selinum.* Stem round, striated; universal involucre none; sheaths of the leaves loose; leaflets filiform, linear. Height from eight inches to a foot.—Native of Germany, Austria, France, and Italy.

7. Selinum Seguieri; *Fennel-leaved Selinum.* Stem roundish, striated; universal involucre none; leaflets trifid, linear, mucronate. Corollas expanded; petals white. It flowers in July.—Native of Italy and Carniola.

8. Selinum Monnieri; *Annual Selinum.* Umbels clustered; universal involucre reflex; five membranaceous ribs to the seed. In a garden it often becomes quite smooth. Annual.—Native of the south of France.

9. Selinum Decipiens. Stem woody, naked below; lower leaves bipinnate; pinnules lanceolate, entire, and gashed-serrate.—Native of Madeira.

Semecarpus; a genus of the class Pentandria, order Trigynia; or of the class Polygamia, order Dioecia.—Generic Character. *Hermaphrodite. Calix:* perianth one-leafed, bell-shaped, inferior, half five-cleft; segments cordate, acute. *Corolla:* petals five, lanceolate, bordered, obtuse, larger than the segments of the calix. *Filamenta:* five, awl-shaped, shorter than the corolla, inserted into the receptacle; antheræ oblong, small. *Pistil:* germen superior, globular, depressed; styles three, recurved, incumbent on the germen, and shorter than it; stigmas club-shaped, retuse. *Pericarp:* none. *Receptacle:* erect, fleshy, pear-shaped or globular, depressed, smooth. *Seed:* a single nut, resting upon the receptacle, heart-shaped, flattened on both sides, smooth, and shining. *Male Flowers:* on a separate tree, smaller than the hermaphrodites. *Calix* and *Corolla:* as in the hermaphrodites. *Stamina:* filamenta five, length of the petals; antheræ much larger. *Pistil:* none; but in its place a semi-globular, hairy, glandulous body. Essential Character. *Calix:* inferior, five-cleft. *Corolla:* five-petalled. *Nut:* kidney-form, inserted into a large, fleshy, flattened receptacle.——The only known species is,

1. Semecarpus Anacardium; *Marking-Nut Tree.* Leaves about the extremities of the branchlets, alternate, petioled, wedge-form, rounded at the apex, entire, firm, above pretty smooth, below whitish and scabrous, from nine to eighteen inches long, and from four to eight broad. The green fruit,

pounded well into a pulp, makes good birdlime. The pure black acrid juice of the shell, is employed by the natives externally to remove rheumatic pains, aches, and sprains; in tender constitutions it often produces inflammation and swelling, but where it has not these inconveniences it is an efficacious remedy. The Telinga physicians employ it in the cure of almost every sort of venereal complaint. It is in general use for marking cotton cloths: the colour is improved, and prevented from running, by a little mixture of quicklime and water. This juice is not soluble in water, and only diffusible in spirits of wine; for it soon falls to the bottom, unless the menstruum be previously alkalized: the solution is then pretty complete, and of a deep black colour. It sinks in expressed oils, but soon unites perfectly with them: alkaline lixivium acts upon it with no better success than plain water. The wood of this tree is reckoned of no use, not only on account of its softness, but also because it contains much acrid juice, which renders it dangerous to cut down and work upon. The fleshy receptacles, on which the seed rests, are roasted in the ashes, and eaten by the natives; their taste is exceedingly like roasted apples: when raw, they taste astringent and acrid, leaving a painful sensation upon the tongue for some time afterwards. The kernels are rarely eaten.—Native of mountainons dry woods throughout the East Indies, flowering in July and August.

Sempervivum; a genus of the class Dodecandria, order Polygynia, or Dodecagynia.—Generic Character. *Calix:* perianth six to twelve parted; segments concave, acute, permanent. *Corolla:* petals six to twelve, oblong, lanceolate, acute, concave, a little bigger than the calix; nectaries usually wanting. *Stamina:* filamenta six to twelve or more, subulate, slender; antheræ roundish. *Pistil:* germina six to twelve, in a ring, erect, ending in as many spreading styles; stigmas acute. *Pericarp:* capsules six to twelve, oblong, compressed, short, in a ring, acuminate outwards, opening inwards. *Seeds:* many, roundish, small. *Observe.* Being very frequently luxuriant, it becomes greater as to the number, especially as to the female parts of the flower. It is allied to *Sedum*, but differs in having more petals than five. Essential Character. *Calix:* twelve-parted. *Petals:* twelve. *Capsules:* twelve, many-seeded.——The species are,

1. Sempervivum Arboreum; *Tree Houseleek.* Stem arborescent, even, branched; leaves wedge-form, smoothish, ciliate; cilias patulous, soft. The flower-stalks rise from the centre of the heads or clusters of leaves, and the numerous bright yellow flowers form a large pyramidal spike or thyrse.—Native of Portugal, the Levant, and Barbary, near Algiers. It flowers through the winter, commonly only from December to March. It is easily propagated, by cutting off the branches, which, when planted, soon put out roots. The cuttings should be laid in a dry place for a week before they are planted, that the bottom may be healed over, otherwise they are apt to rot, especially if they have much wet. When the cuttings are in pots, they should be placed in a shady situation, and must have little wet; and if they are planted in a shady border, they will require no water, for the moisture of the ground will be sufficient for them. The variety with striped leaves is the most tender, and least able to endure the wet in winter.

2. Sempervivum Canariense; *Canary Houseleek.* Stem frutescent; leaves orbicular-spatulate, villose; nectaries subquadrate, truncate. At the top of the stalk is a very large crown of leaves disposed circularly like a full-blown Rose: they are large, succulent, soft to the touch, and pliable, ending in obtuse points, which are a little incurved. The flower-stalk comes out from the centre, and rises nearly two feet high, branching out from the bottom, so as to form a regular pyramid of flowers of an herbaceous colour.—Native of the Canaries, flowering in May and June. It is propagated by seeds, which should be sown soon after they are ripe, in pots filled with light sandy earth, covering them but very slightly, and placing the pots under a common frame to keep out the frost. They should be exposed to the open air at all times in mild weather. In spring they should be removed to a situtation where they may have only the morning sun, and be watered gently in dry weather. This treatment will soon bring up the plants, which must be kept clean from weeds, and when they are fit to remove should be planted in pots of light loamy earth, and placed in the shade till they have taken new root; they may then be mixed with other hardy succulents in a sheltered situation for the summer, but in winter must be placed in a frame, where they may be protected from frost, and enjoy the free air in mild weather.

3. Sempervivum Glutinosum; *Clammy Houseleek.* Stem frutescent; leaves wedge-form, viscid, ciliate; cilias cartilaginous, pressed close. It flowers in July and August.—Native of Madeira. This will succeed with the treatment of a greenhouse plant in the summer, but does best in a dry-stove during the winter.

4. Sempervivum Glandulosum; *Glandulous-leaved Houseleek.* Stem frutescent; leaves orbicular-spatulate, glandular at the edge; glands globular; nectaries wedge-form, truncate.—Native of Madeira, flowering there from March to May. To be treated as the third species.

5. Sempervivum Tectorum; *Common Houseleek.* Leaves ciliate; offsets spreading. Root perennial, fibrous; root-leaves in the form of a full-blown double Rose; flowering-stem upright, from nine inches to a foot in height, round, fleshy, pubescent; leaves extremely succulent; flowers numerous, clustered, upright, pubescent, flesh-coloured, all growing one way. The juice of this plant, either applied by itself, or mixed with cream, gives immediate relief in burns, and other external inflammations; with honey, it is a useful application in the thrush. Boerhaave found ten ounces of the juice beneficial in dysenteries, and others have successfully prescribed it in gonorrhœas; but it is not admitted into modern practice. Linneus informs us, that this plant is a preservative to the coverings of houses in Smoland. It may easily be made to cover the whole roof of a building, whether of tiles, thatch, or wood, by sticking the offsets on with a little earth or cow-dung.—Native of most parts of Europe, flowering in July. This, and the species referred to this, are hardy: they love a dry soil, and are proper to plant on rock-work, where they will thrive better than in the full ground; and when they are once fixed will spread fast enough, so that the larger sorts require to be reduced annually, to keep them within proper compass. The heads die soon after they flower, but the offsets soon supply their places.

6. Sempervivum Globiferum; *Globular Houseleek.* Leaves ciliate; offsets globular. Flowers large and handsome, in a terminal cluster; their petals yellow, and lilac-coloured at the base. It flowers in June and July.—Native of Russia, Austria, Germany, and Switzerland.

7. Sempervivum Villosum; *Hairy Houseleek.* Leaves spatulate, wedge-form, obtuse, villose; nectaries palmate; segments subulate; petals eight, yellow. Annual. It flowers in June.—Native of Madeira.

8. Sempervivum Tortuosum; *Gouty Houseleek.* Leaves obovate, beneath gibbous, villose; nectaries two-lobed. This is a shrubby plant, of low growth, producing numerous fleshy evergreen leaves. It flowers in July and August.—Native of the Canaries. Propagated by cuttings.

9. Sempervivum Stellatum; *Starry Houseleek.* Stem herbaceous, pubescent; leaves spatulate, scattered. This is a lax and diffuse miniature of the first species.—Native place unknown. To be treated as the fifth species.

10. Sempervivum Arachnoidæum; *Cobweb Houseleek.* Leaves interwoven with hairs; offsets globular.—Native of the mountains of Switzerland, Dauphiny, and Italy. It flowers in June and July, and is commonly known by the name of *Cobweb Sedum*, though evidently a *Sempervivum* in habit as well as in fructification.

11. Sempervivum Hirtum; *Rough Houseleek.* Stem-leaves and ends of the petals rough-haired; root hard, round, perennial, from which there are many rose-like tufts of leaves.—Native of Germany, Silesia, and Piedmont.

12. Sempervivum Montanum; *Mountain Houseleek.* Leaves quite entire; offsets spreading. This greatly resembles the Common Houseleek; but the leaves are smaller, and have no indentures on their edges. Flowers beautifully variegated with lilac and a brownish-red colour. It flowers in June and July.—Native of Germany, Silesia, Austria, Switzerland, the south of France, and Italy.

13. Sempervivum Sediforme; *Stonecrop-leaved Houseleek.* Leaves scattered; lower ones cylindrical, upper ones flattened. All the stems are perpetually and constantly very still, and standing upright. It flowers in July.—Native of the south of Europe. Treat it in the same manner as the fifth species.

14. Sempervivum Monanthes; *Clustered Houseleek.* Leaves round, club-shaped, clustered; peduncles naked, mostly one-flowered; nectaries obcordate. The number of the parts of fructification varies from five to eight. It flowers in July, and during most of the summer months.—Native of the Canary islands.

Senecio; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common calicled, conical, truncate; scales awl-shaped, very many, parallel, in a cylinder contracted above, contiguous, equal, fewer, covering the base, imbricatewise, the tops mortified. *Corolla:* compound, higher than the calix; corollets hermaphrodite, tubular, numerous in the disk: females ligulate in the ray, if any present: proper in the hermaphrodites funnel-form; border reflex, five-cleft: in the females, if any, oblong, obscurely three-toothed. *Stamina:* in the hermaphrodites, filamenta five, capillary, very small; antheræ cylindric, tubular. *Pistil:* in both; germen ovate; style filiform, length of the stamina; stigmas two, oblong, revolute. *Pericarp:* none; calix conical, converging. *Seeds:* in the hermaphrodites solitary, ovate; pappus capillary, long: in the females very like the hermaphrodities. *Receptacle:* naked, flat. Essential Character. *Calix:* cylindrical, calicled, with the scales mortified at the tip. *Down:* simple. *Receptacle:* naked.——The species are,

* *With flosculous Flowers.*

1. Senecio Hieracifolius; *Hieracium-leaved Groundsel.* Corollas naked; leaves embracing, lacerate; stem herbaceous, erect.—Native of North America. Sow the seeds upon a hot-bed in the spring; and when the plants are fit to remove, transplant them to another hot-bed to bring them forward; and afterwards place them in a warm border, where they will flower in July, and their seeds will ripen in autumn.

2. Senecio Purpureus; *Purple Groundsel.* Corollas naked; leaves lyrate, rough-haired, the upper ones lanceolate, toothed.—Native of the Cape.

3 Senecio Erubescens; *Blush-coloured Groundsel.* Corollas naked; leaves lyrate, hairy, clammy, the upper ones oblong, lanceolate, toothed; stems ascending. Annual, flowering from June to October.—Native of the Cape.

4. Senecio Cernuus; *Drooping Groundsel.* Corollas naked; leaves elliptic, tooth-serrate, somewhat hairy; peduncles elongated, one-flowered. Annual; flowering in July and August.—Native of the East Indies and Madagascar.

5. Senecio Persicifolius; *Peach-leaved Groundsel.* Corollas naked; leaves lanceolate, quite entire, toothed at the base; stem simple, a little villose.—Native of the Cape.

6. Senecio Virgatus; *Twiggy Groundsel.* Corollas naked; leaves lyrate, tomentose underneath; peduncles one-flowered; scales awl-shaped.—Native of the Cape.

7. Senecio Divaricatus; *Straddling Groundsel.* Corollas naked; leaves lanceolate, toothed, rugged; flowering branchlets divaricating.—Native of China.

8. Senecio Pseudo-China; *Chinese Groundsel.* Corollas naked; leaves lyrate, pinnatifid, toothed; scape almost naked, very long; root perennial.—Native of the East Indies. Part the roots in spring. Plant the offsets in pots filled with light kitchen-garden earth, and plunge them in the tan-bed in the stove, where they must remain.

9. Senecio Reclinatus; *Grass-leaved Groundsel.* Corollas naked; calices ventricose, subimbricate; leaves filiform, linear, quite entire, smooth. Stem woody, erect, three feet high, shrubby.—Native of the Cape.

10. Senecio Vulgaris; *Common Groundsel.* Corollas naked; leaves pinnatifid, sinuate, embracing; flowers scattered. Root annual, consisting of numerous white fibres. This species, with a few others, having no ray, belongs to the first order of the class Syngenesia in the artificial system, but naturally it is of this genus. The flower-buds and young tops are the food of many small birds, and are given to canaries and other songsters confined in cages. A strong infusion of the plant is an emetic, and the bruised leaves are a good application to boils. The fresh roots smelled to, as soon as taken out of the ground, are said to be an immediate cure for the headache. Farriers give the juice to horses troubled with the botts; whence Mr. Ray concludes that it might be successfully given to kill worms in the human body. According to Linneus, goats and swine eat it, cows are not partial to it, and horses and sheep decline it. In the eastern counties it is called *Simson*, or, as it is pronounced, *Senshon.*—Native of Europe and Siberia. No weed is more common in all kinds of cultivated grounds; flowering nearly the whole year.

11. Senecio Biflorus; *Two-flowered Groundsel.* Corollas naked; leaves linear, flat, somewhat toothed, even; peduncles subbiflorous. Stem shrubby; branches striated; calix untouched.—Native of Egypt.

12. Senecio Arabicus; *Arabian Groundsel.* Corollas naked; leaves subbipinnate, petioled, even; peduncles many-flowered.—Native of Egypt.

13. Senecio Peucedanifolius. Corollas naked; leaves pinnate, filiform; stems herbaceous, a foot and half high.—Native of the Cape.

14. Senecio Japonicus; *Jagged-leaved Groundsel.* Corollas naked; leaves pinnatifid; segments lanceolate, acute, gashed; stipules leafy, subpalmate.—Native of Japan, where it flowers in July, August, and September.

15. Senecio Elongatus. Plant glabrous; radical leaves spathulate, serrate; stem-leaves pinnatifid, dentated, very remote; peduncles elongate, umbellate-corymbose.—Grows on rocks, near the banks of rivers, about Easton, Pennsylvania.

16. Senecio Pauciflorus. Plant glabrous; radical leaves long-petioled, ovate-subrotund, subcordate, dentated; stem-leaves two, remote, pinnatifid, dentated; peduncles short, subtern, umbellate.—This species does not rise above the height of a span, and Grows in Labrador and Carolina.

** *Flowers radiate; Ray revolute.*

17. Senecio Triflorus; *Three-flowered Groundsel.* Corollas revolute; leaves sessile, sinuate; calices conical; scales very small, untouched.—Native of Egypt.

18. Senecio Ægyptus; *Egyptian Groundsel.* Corollas revolute; leaves embracing, sinuate; scales of the calix shorter, entire, mortified.—Native of Egypt.

19. Senecio Cinerascens; *Gray Groundsel.* Corollets revolute; leaves pinnatifid, tomentose, rolled back at the edge; panicle patulous; outer scales of the calix spreading. It flowers from May to July.—Native of the Cape.

20. Senecio Lividus; *Livid Groundsel.* Corollas revolute; leaves embracing, lanceolate, toothed; scales of the calix very short, untouched. Annual.—Native of Spain, &c.

21. Senecio Trilobus; *Three-lobed Groundsel.* Corollas revolute; leaves embracing; scales of the calix mortified, lacerated. Annual.—Native of Spain.

22. Senecio Viscosus; *Stinking Groundsel.* Corollas revolute; calicles loose, nearly equal to the perianth; leaves pinnatifid, viscid. Stem very much branched, patulous; root annual; flowers of a bright gold-colour.—Native of Europe, in a calcareous or sandy soil; flowering from July to October. Found in the fen-banks of the isle of Ely, as about Megpole and Chatteress; also on the sands of Gamlingay; at Baldon in Oxfordshire; about the chalk-pits at Dartford in Kent; and in several parts of Scotland.

23. Senecio Sylvaticus; *Mountain Groundsel.* Corollas revolute; calicle very short; leaves pinnatifid, lobed, toothletted; stem erect, strict, corymbed; root annual. It flowers in July.—Native of Europe, in a gravelly or sandy soil, in bushy spots upon heaths and commons; where trees or furze have been cut down, especially where Fern or other plants have been burnt in the autumn.

24. Senecio Nebrodensis. Corollas revolute; leaves lyrate, sinuate, obtuse, petioled; stem hirsute.—Native of Siberia, Spain, and the Pyrenees.

25. Senecio Glaucus; *Sea-green Groundsel.* Corollas revolute; leaves embracing, lanceolate, obtuse, toothed, quite entire. Annual.—Native of Egypt.

26. Senecio Varicosus; *Varicose Groundsel.* Corollas revolute; leaves ovate, petioled, toothed, with little ventricose dots.—Native of Egypt.

27. Senecio Humilis; *Dwarf Groundsel.* Corollas revolute; leaves subspatulate, obtuse, doubly toothed; stem procumbent; root annual; branches alternate, short, spreading, three or four.—Native of Barbary.

28. Senecio Leucanthemifolius. Corollas revolute; leaves elliptic, spatulate, smooth, gashed, toothed; corymb few-flowered. Roots numerous, capillary, twisted, in bundles.—Native of all Barbary.

*** *Flowers radiate; Ray spreading; Leaves pinnatifid.*

29. Senecio Hastatus; *Spleenwort-leaved Groundsel.* Corollas radiant; petioles embracing; peduncles three times as long as the leaf; leaves hastate, sinuate.—Native of the Cape of Good Hope, where it flowers during most part of the summer. Cut off the side-shoots in any of the summer months, and plant them in a shady border, where, in five or six weeks, they will take root, and may then be taken up and planted in pots, placing them in the shade till they are well rooted; then remove them to an open situation, observing to water them in dry weather. In winter, place them under a frame, or in the dry-stove. This management applies to the numerous species from the Cape of Good Hope.

30. Senecio Pubigerus. Corollas radiant; radical petioles woolly; leaves runcinate. Stems quite simple, lateral; flowers sessile; root perennial. There is one terminating flower, and frequently lateral ones that are sessile; they are yellow, with a violet-coloured ray.—Native of the Cape.

31. Senecio Venustus; *Wing-leaved Groundsel.* Corollas radiant; stem, calix, and leaves, smooth; leaves pinnatifid; segments linear, acute, toothed. Biennial; flowering from July to September.—Native of the Cape.

32. Senecio Elegans; *Elegant Groundsel,* or *Purple Jacobæa.* Corollas radiant; leaves hairy, viscid, pinnatifid, equal, spreading very much; rachis narrowed below; calices rough-haired. This is an annual plant, having many herbaceous branching stalks, nearly three feet high. The flowers are produced in bunches on the top of the stalks; they are large, the ray of a beautiful purple colour, and the disk yellow. It flowers from June or July till the autumnal frosts come on. A variety with very double flowers, and another with white equally double, are frequently preferred, especially the former, to the single plant.—Native of the Cape. If the seeds, which ripen in autumn, be permitted to scatter, plenty of plants will rise in the spring following; or if sown upon a bed of common earth in the spring, the plants may be transplanted into the borders of the flower-garden. If some of the plants be put into pots, and housed in winter, they may be preserved till spring. The varieties with double flowers are continued by cuttings.

33. Senecio Squalidus; *Inelegant Ragwort.* Corollas radiant, spreading; florets elliptic, quite entire; leaves pinnatifid, the segments sublinear, distant. Root annual; stem various in luxuriance, erect, branched, often a little hairy; flowers of a bright golden yellow. The whole habit, and a peculiar smell somewhat like Tansy or Mugwort, sufficiently distinguish this plant from all the rest. It flowers from June to the end of autumn.—Native of the south of France. Found in abundance on walls near Oxford.

34. Senecio Erucifolius; *Rocket-leaved Groundsel.* Corollas radiant; leaves pinnatifid, toothed, somewhat rough-haired; stem erect.—Native of Sweden and Germany.

35. Senecio Tenuifolius; *Hoary Groundsel,* or *Ragwort.* Corollas radiant, spreading; leaves pinnatifid, subrevolute, beneath paler and pubescent. Stem erect, villose; root perennial, moderately creeping. No plant is more valuable in the appearance of its foliage. On a calcareous soil the leaves are much rolled back, and quite white beneath, with a thick cottony web, of which the stem always more or less partakes: in damp shady places they are almost flat and green, though always paler, and somewhat shaggy on the under side. These are the extremes of the two varieties, but intermediate specimens may easily be found.—Native of Austria and England. Found about London, near woods, under hedges, and among bushes, as about the Oak-of-Honour wood, near Peckham; also at Holm in Norfolk; on the Bath hills; near Bungay in Suffolk, &c. It flowers in August.

36. Senecio Incanus; *Downy Groundsel.* Corollas radiant; leaves tomentose on both sides, subpinnate, obtuse; corymb roundish. Perennial. Stalks seldom a foot high. It flowers in July and August.—Native of the Alps, Austria, Carniola, Silesia, the south of France, and the Pyrenees. Slip off the heads in spring, and plant them in a bed of loamy earth, in a shady situation: when they have put out roots, transplant them into an east border, for they prefer a situation not much exposed to the sun. Having fine hoary leaves, and gold-coloured flowers, this species makes a pretty diversity when mixed with other plants. Requiring little culture, and not taking up much room, it deserves a place in small gardens.

37. Senecio Abrotanifolius; *Southernwood-leaved Groundsel.* Corollas radiant; leaves pinnatifid, jagged; leaflets linear

naked, acute; stalks mostly two-flowered. Stem one to two feet high, striated upwards; flowers large and handsome, in bunches at the top of the stalks, yellow. It flowers from July to October — Native of the mountains of Stiria and Carinthia, Switzerland, the south of France, and Piedmont. Sow the seeds upon a bed of loamy earth, exposed to the morning sun only. When the plants are fit to remove, transplant them to a shady border, where they may remain till autumn, observing to keep them clear from weeds all the summer: then transplant them to the places where they are to remain. In the second summer they will flower and produce seeds.

38. Senecio Canadensis; *Canadian Groundsel.* Corollas radiant; all the leaves bipinnate-linear; peduncles corymbed. —Native of Canada.

39. Senecio Diffusus; *Spreading Groundsel.* Corollas radiant; leaves bipinnate, linear; stems diffused.—Native of the Cape.

40. Senecio Delphinifolius; *Larkspur-leaved Groundsel.* Corollas radiant, spreading; leaves pinnate, multifid; leaflets linear, revolute, villose beneath; stem somewhat woolly. Perennial.—Native of Algiers.

41. Senecio Auriculatus; *Earletted Groundsel.* Corollas radiant, with the corollets in the ray scarcely visible; leaves pinnatifid, embracing; pinnules obtuse, toothed, somewhat remote. Annual.—Native of the deserts of Barbary.

42. Senecio Giganteus; *Giant Groundsel.* Corollas radiant, revolute; flowers in corymbs revolute; peduncles elongated, one-flowered; leaves half round, somewhat fleshy, embracing; pinnules linear-subulate, unequal; stem erect, smooth.—Native of Africa, near Belide in Algiers.

43. Senecio Coronopifolius; *Buckthorn* or *Plantain-leaved Groundsel.* Corollas radiant, revolute; peduncles elongated, one-flowered; leaves half round, somewhat fleshy, embracing; pinnules linear-subulate, unequal.—Native of Barbary, in the wet sands of the desert.

44. Senecio Jacobæa; *Raywort Groundsel,* or *Common Ragwort,* or *Ragweed.* Corollas radiant, spreading; leaves lyrate-bipinnatifid, divaricate-toothed, smooth; stem erect. Root perennial, fibrous, creeping, truncated; flowers corymbose, terminal, very numerous, of a bright golden yellow.—This plant is very common on the sand hills of Holland, without any ray to the corolla; and this has also been observed on the sea-shore near Drogheda in Ireland: perhaps this is caused by the sea air, which is well known to be destructive to the more tender parts of vegetables. In Marazion marsh, Cornwall, it has been observed with rayless flowers, and the whole plant hoary with a dense cottony substance. If this plant be gathered before the flowers open, and used while fresh, it will dye wool of a full green, but the colour is apt to fade. Woollen cloth boiled in alum-water, and then in a decoction of the flowers, takes a beautiful yellow. A poultice made of the fresh leaves, has a surprising effect in removing pains of the joints, and is said to remove the sciatica, or hip-gout, in two or three applications, when ever so violent. The root is of a healing, astringent nature; a decoction of it is good for inward wounds and bruises; but it is not so much used as it deserves to be. It is said that horses and cows will eat it when young; but much of it escaping their bite, it flowers and seeds, and fills the pastures with a large rank weed. It may, however, be gradually destroyed by constant mowing, and most effectually by hand, after rain. Feeding the land with sheep is said to be an infallible cure for it: and it is asserted, that they eat it with so much greediness as very soon to destroy it; but this can only be where it is very young. It is sometimes called *St. James s-wort, Cankerwort, Seggrum,* or *Seagrim;* and in the neighbourhood of Liverpool, is known by the name of *Fleanart.*—Abundant in waste ground, flowering in the height of summer, when it forms a contrast with the surrounding scorched and withered herbage.

45. Senecio Aquaticus; *Marsh Groundsel,* or *Ragwort.* Corollas radiant, spreading; florets elliptic; leaves lyrate, serrate, the lower ones obovate, entire; seeds smooth; root perennial.—Very common in marshes, ditches, wet meadows, and watery places; flowering in July and August.

46. Senecio Aureus; *Golden Groundsel.* Corollas radiant; leaves crenate, the lower cordate, petioled, the upper pinnatifid, lyrate; root perennial. It flowers in May and June. Native of Virginia and Canada.—Plant the offsets in autumn, in an eastern border of loamy earth, allowing each plant two feet room to spread.

47. Senecio Lyratus; *Lyrate-leaved Groundsel.* Corollas radiant; lower leaves lyrate, toothed, upper serrate, embracing; lobes muricate at the edge. This is one of the tallest species.—Native of the Cape.

48. Senecio Aureus; *Eared Groundsel.* Corollas radiant; leaves lanceolate, lyrate, pinnate, toothed, naked; petioles eared; stem erect.—Native place uncertain.

49. Senecio Alpinus; *Alpine Groundsel.* Corollas radiant; leaves cordate-lyrate, grossly serrate; petioles eared; stem herbaceous.—Native of Germany.

50. Senecio Umbellatus; *Umbelled Groundsel.* Corollas radiant, linear; leaves pinnate-toothletted; segments distant. —Native of the Cape.

**** *Flowers radiate; Ray spreading; Leaves undivided.*

51. Senecio Lanceus: *Spear-leaved Groundsel.* Corollas radiant; leaves lanceolate, cordate at the base, embracing, even, finely serrate; stem frutescent. It flowers from July to October.—Native of the Cape.

52. Senecio Linifolius; *Flax-leaved Groundsel.* Corollas radiant; leaves linear, quite entire; corymb somewhat scaly; stem herbaceous. The peduncles have small acute scales scattered over them.—Native of Spain, Italy, and Russia.

53. Senecio Rosmarinifolius; *Rosemary-leaved Groundsel.* Corollas radiant; leaves linear, revolute at the edge; stem shrubby.—Native of the Cape.

54. Senecio Paludosus; *Marsh Groundsel,* or *Bird's Tongue.* Corollas radiant, spreading; flowers corymbed; leaves ensiform, acutely serrate, subvillose beneath; stem strict; root consisting of many long simple fibres, perennial, somewhat creeping; flowers yellow.—Native of fens and marshes, in all parts of Europe generally. This and the three following species are easily propagated by seeds, or by parting their roots: the latter mode is generally practised when the plants are once obtained, that being the most expeditious method, especially for the fifty-sixth species, the roots of which spread, and increase too fast, where they are not confined. The time for dividing and transplanting these roots is in autumn, when the stalks decay. They are too large plants for small gardens, but in those which are extensive, will adorn large borders, on the sides of woods and plantations, where they can be allowed room, and, if intermixed with other tall-growing plants, will add to the variety.

55. Senecio Nemorensis; *Branching Groundsel.* Corollas radiant, eight-fold; leaves lanceolate, biserrate, villose underneath; stem branched; root perennial, fibrous, not creeping. It flowers in July.—Native of Germany, Austria, Switzerland, Piedmont, and Siberia. See the preceding species.

56. Senecio Saracenicus; *Broad-leaved Groundsel.* Corollas radiant, spreading; flowers corymbed; leaves lanceolate, serrate, smoothish. Root perennial, creeping; stem erect. —Native of many parts of Europe. Found in various parts of Great Britain, as between Wells and Glastonbury; near

Halifax, in Yorkshire; at Salkeld, in Cumberland; about Clapham and Ingleton, in Surry; near Longtown, and on the side of the river, below Carlisle; and near Preston Hall, between Kirkby Lonsdale and Kendal, in Westmoreland. See the fifty-fourth species.

57. Senecio Coriaceus; *Thick-leaved Groundsel.* Corollas radiant; scales of the calix pressed close; leaves subdecurrent, somewhat villose underneath, lanceolate, serrate. Root perennial; stem annual; flowers terminating, in a compact corymb of a deep yellow colour. It flowers in July and August.—Found in the Levant. See the fifty-fourth species.

58. Senecio Sibiricus; *Siberian Groundsel.* Corollas radiant, five-rayed; leaves elliptic, even; root perennial; stem erect.—Native of Siberia.

59. Senecio Doria; *Broad-leaved Groundsel.* Corollas radiant; flowers corymbed; leaves subdecurrent, naked, lanceolate, toothletted, the upper ones gradually smaller. Root perennial, brownish, bitter, with long white fibres; stem two to five feet high, much branched upwards, striated; flowers small, numerous, palish yellow. It flowers from July to September.—Native of the Levant, Austria, the south of France, and Piedmont.

60. Senecio Doronicum. Corollas radiant; stem undivided, one or two flowered; leaves undivided, serrate; root-leaves ovate, villose underneath.—Native of the south of Europe.

61. Senecio Longifolius; *Long-leaved Groundsel.* Corollas radiant; leaves linear, scattered; stem shrubby.—Native of the Cape.

62. Senecio Cruciatus: *Cross-leaved Groundsel.* Corollas radiant; leaves linear, tomentose underneath, the lower cruciate, the upper entire.—Found by Thunberg at the Cape.

63. Senecio Juniperinus; *Juniper Groundsel.* Corollas radiant; stem shrubby; leaves awl-shaped.—Native of the Cape.

64. Senecio Byzantinus. Corollas radiant; leaves oblong, remotely toothed, spiny, toothletted, naked above; stem herbaceous.—Native of Turkey.

65. Senecio Hadiensis. Corollas radiant, five-rayed; leaves elliptic, petioled, quite entire and toothletted; stem shrubby. —Native of the Cape.

66. Senecio Halimifolius; *Succulent-leaved Groundsel.* Corollas radiant; leaves obovate, fleshy, toothed; stem shrubby.—This, with the other Cape species, are too tender to live in the open air of an English winter, yet only require protection from hard frosts: and if kept in pots, and placed either under a frame in winter, or in a common greenhouse with other hardy kinds of plants, which require a large share of air in mild weather, will survive the winter. They are all easily propagated by seeds or cuttings, but the last method is preferred for the sake of expedition. If the cuttings are planted in a shady border during summer, they will soon take root, and should be taken up with balls of earth to their roots, and planted in separate pots filled with good kitchen-garden earth, then replaced in the shade to take root, and afterwards removed to an open situation till winter, when they should be sheltered, and treated like other hardy greenhouse plants. If propagated by seeds, they should be sown on a bed of fresh earth, exposed only to the morning sun, till the beginning of April; moisten the ground in dry weather, to forward their vegetation. When the plants appear, weed them till they are fit to remove, and then treat them in the same manner as those raised from cuttings.

67. Senecio Ilicifolius; *Ilex-leaved Groundsel.* Corollas radiant; leaves sagittate, embracing, toothed; stem herbaceous. This has a very branching stalk, four or five feet high, sending out branches irregularly on every side. It flowers in June and July.—Native of the Cape.

68. Senecio Asper; *Rough-leaved Groundsel.* Corollas radiant; leaves lanceolate, linear, toothed, rigid; calices somewhat lanuginous.—Native of the Cape.

69. Senecio Rigidus; *Hard-leaved Groundsel.* Corollas radiant; leaves embracing, spatulate, repand, erose, rugged; stem shrubby. The flowers are produced at the ends of the branches, and are of a bright yellow colour. It flowers from June to September.—Native of the Cape.

70. Senecio Populifolius; *Poplar-leaved Groundsel.* Corollas radiant; leaves ovate, spatulate, entire, blunt; the more adult smooth above; stem shrubby. This plant is clothed with white wool.—Native of the Cape.

71. Senecio Angulatus; *Angular-leaved Groundsel.* Corollas radiant; leaves petioled, ovate, tooth-angular, smooth. This is one of the loftiest species. The leaves are rather fleshy and glaucous.—Native of the Cape.

72. Senecio Maritimus; *Sea Groundsel.* Corollas radiant; leaves embracing, ovate, toothletted, fleshy; stem herbaceous, procumbent. The whole of this plant is generally fleshy. It varies with lanceolate leaves.—Native of the Cape.

73. Senecio Erosus. Corollas radiant; leaves radical, petioled, oblong, sinuate, serrate, villose; stem one-flowered, almost naked.—Native of the Cape.

74. Senecio Marginatus. Corollas radiant; leaves embracing, lanceolate, smooth, subarticulate, margined; corymb compound.—Native of the Cape.

75. Senecio Lanatus. Corollas radiant; leaves sessile, woolly on both sides, toothed, the lowest ovate, the upper lanceolate.—Native of the Cape.

76. Senecio Cordifolius. Corollas radiant; leaves cordate, toothed; calices quite simple.—Native of the Cape.

77. Senecio Glastifolius. Corollas radiant; leaves embracing, lanceolate, somewhat toothed, even.—Native of the Cape.

Sen Green. See *Saxifraga.*

Senna. See *Arachis* and *Cassia.*

Senna, Bladder. See *Colutea.*

Senna, Scorpion. See *Emerus.*

Sensitive Fern. See *Onoclea.*

Sensitive Plant. See *Mimosa.*

Septas; a genus of the class Heptandria, order Heptagynia. —Generic Character. *Calix:* perianth seven-parted, spreading, acute, permanent. *Corolla:* petals seven, oblong, equal, twice as long as the calix. *Stamina:* filamenta seven, awl-shaped, length of the calix; antheræ subovate, erect. *Pistil:* germina seven, oblong, ending in awl-shaped styles, the length of the stamina; stigmas bluntish. *Pericarp:* capsules seven, oblong, acute, parallel, one-valved. *Seeds:* numerous. Essential Character. *Calix:* seven-parted. *Petals:* seven. *Germina:* seven. *Capsule:* seven, many-seeded.——The only known species is,

1. Septas Capensis; *Round-leaved Septas.* Root perennial, tuberous, fibrous; stem short, simple; crowned with a tuft of about four, blunt, naked, crenate, succulent leaves; the two lower opposite, larger, subpetioled, roundish, the two upper opposite, oval, sessile, narrower; flowers pink-coloured. Perennial: flowering in August and September.—Native of the Cape.

Septfoil. See *Tormentilla.*

Serapias; a genus of the class Gynandria, order Diandria. —Generic Character. *Calix:* spathes wandering; spadix simple; perianth none. *Corolla:* petals five, ovate-oblong, from erect, patulous, converging upwards; nectary length of the petals, excavated at the base, melliferous, ovate, gibbous below, trifid, acute; the middle segment cordate, obtuse, three-toothed at the base, with a bifid scar. *Stamina:* filamenta two, very short, placed on the pistil; antheræ erect,

under the upper lip of the nectary. *Pistil:* germen oblong, contorted, inferior; style growing to the upper lip of the nectary; stigma obsolete. *Pericarp:* capsule obovate, bluntly three-cornered, with three keels adjoined, three-valved, opening under the keels, one-celled. *Seeds:* numerous, saw-dust form. *Receptacle:* linear, adjoined to each valve of the pericarp. Essential Character. *Nectary:* ovate, gibbous, with an ovate lip.—Plants of this genus being difficult to preserve and propagate, few persons have attempted to keep them in gardens. They may be taken up from the places where they grow naturally, when their leaves begin to decay, and planted in a shady moist place, where they will thrive and flower.——The species are,

1. Serapias Latifolia; *Broad-leaved Helleborine.* Roots creeping; leaves ovate, embracing; flowers drooping; lip entire, pointed, shorter than the petals. Stem simple, erect, nearly two feet high. The colour of the flowers is very variable; they have generally a faint aromatic Orchis-like smell. There is a variety differing only in not being so tall, the leaves less, and the fibres of the roots very long and tough, owing to its situation, which is mountainous; as, four miles from Settle in Yorkshire; or on Conick Scar, four miles from Kendal, growing at the foot of the Scar itself, and among the loose stones and rubbish, in a situation not accessible without difficulty and danger.—This species is a native of the woods, groves, and hedges, of Europe; flowering in July and August. It is not unfrequent in the mountainous parts of Britain, as in the North Riding of Yorkshire; about Matlock, in Derbyshire; Buckham wood, in Cumberland; and in the Red Rock plantation, Edgbaston Park: it occurs in Scotland, at Chatelherault, near Hamilton; and in the woods of Comrie, in Strathearn; also in Kingston wood, Cambridgeshire: Thurleigh and Sheerhatch, in Bedfordshire; Northleigh and Stokenchurch woods, in Oxfordshire; about Ospringe in Kent; Buddon wood, and about Loughborough, in Leicestershire; Broadly and Clenton woods, in Dorsetshire; Selborne in Hampshire; and in Ireland, in the plantations of Lord Dungannon, at Belvoir.

2. Serapias Palustris; *Marsh Helleborine.* Roots creeping; leaves lanceolate, embracing; flowers drooping; lip crenate, obtuse, equal to the petals. Stem erect, simple, from twelve to eighteen inches high. The different lengths of the lips, and the shape of the germina, will always distinguish between this and the preceding species; and should the woolliness of the peduncle, flower, and germina, be constant in this, and always wanting in the first species, their difference will be obvious at first sight.—Native of Europe, in swampy meadows, watery places, marshes, morasses, and bogs. Not uncommon in England; found on the bogs of Chiselhurst; in Kent, Essex, Norfolk, Cambridgeshire, Bedfordshire, Oxfordshire, Leicestershire; near Leeds, in Yorkshire; on the borders of Malvern Chase, in Worcestershire; near Sturminster, Newton, and between Wimbourne and Ringwood, Dorsetshire; on Knutsford moor, Cheshire; and near Duntulm castle, in the Isle of Skye, Scotland.

3. Serapias Ensifolia; *Sword-leaved Helleborine.* Root fibrous; leaves sword-shaped; bractes much shorter than the germen; flowers erect; lip obtuse, half as long as the petals.—Native of several parts of Europe. Found under Brackenbrow or Brackenwray, opposite Helk's wood, a mile from Ingleton, in Yorkshire; in Lord Lonsdale's woods at Lowther, in Westmoreland; on the top of Aberly hill, in Worcestershire; also in Wire forest, in the same county; and in some parts of Herefordshire, and in Ireland.

4. Serapias Grandiflora; *White Helleborine.* Root creeping; leaves elliptic lanceolate; bractes longer than the germen; flowers erect; lip obtuse, rather shorter than the petals. Stem about a foot high.—Native of Europe, in woods and thickets: it flowers in June, and is chiefly found in the midland counties of England, viz, at Stokenchurch woods, and Shotover plantations, in Oxfordshire; about Marlow, in Buckinghamshire; in the woods at Grange, in the isle of Purbeck; in the grove at the Down house, near Blandford; and at Littlewood and Chettle in Dorsetshire; at Feversham and Quey in Cambridgeshire, and in the Isle of Ely; in Lord Lonsdale's wood, against Alkham Hall, in Westmoreland; and in Scotland, in a wood at Loch Ramsa, in the Isle of Arran.

5. Serapias Nivea; *Snowy Helleborine.* Leaves lanceolate; flowers loosely racemed, erect; bractes very small; lip obtuse, twice as short as the petals; roots brown, flexuose, numerous.—Native of Algiers, on hills.

6. Serapias Polystachya; *Many-spiked Helleborine.* Roots fibrous; stem subdivided, jointed; leaves oblong-lanceolate; raceme compound, terminating; lip of the nectary ovate, recurved.—Native of Jamaica and Hispaniola.

7. Serapias Flava; *Yellow Helleborine.* Roots fibrous; stem subdivided, jointed; leaves oblong, lanceolate; racemes compound, axillary; lip of the nectary erect, acuminate.—Native of Jamaica.

8. Serapias Rubra; *Purple Helleborine.* Root creeping; leaves lanceolate; bractes longer than the germen; flowers erect; lip acute, marked with wavering lines.—Native of Europe. Found in Gloucestershire, on Hampton Common.

9. Serapias Lingua; *Narrow-leaved Helleborine.* Bulbs roundish; lip of the nectary trifid, acuminate, smooth, longer than the petals. It flowers in May.—Native of France, Switzerland, Carniola, Italy, and Africa, near Algiers.

10. Serapias Cordigera; *Heart-lipped Helleborine.* Bulbs roundish; lip of the nectary trifid, acuminate, very large, bearded at the base. It flowers early in the spring.—Native of Spain, Italy, the Levant, and near Algiers.

11. Serapias Capensis; *Cape Helleborine.* Leaves conduplicate-ensiform; stem almost naked above; sheaths spathaceous.—Native of the Cape.

12. Serapias Erecta; *Upright Helleborine.* Leaves ovate, embracing; flowers erect; stem erect, subflexuose, angular, smooth, a span high.—Native of Japan.

13. Serapias Falcata; *Sickle-leaved Helleborine.* Leaves ensiform, convoluted, sickle-form; flowers erect. It flowers in April.—Native of Japan.

14. Serapias Regularis. Bulbs ovate, fibrous; leaves sheathing, ensiform, keeled; scape erect, spiked, corollas six-petalled.—Native of New Zealand.

Seriola; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common simple; leaflets linear, almost equal, erect. *Corolla:* compound imbricate, uniform; corollets hermaphrodite, equal, numerous; proper one-petalled, ligulate, linear, truncate, five-toothed. *Stamina:* five, capillary, very short; antheræ cylindrical, tubulous. *Pistil:* germen ovate; style filiform, length of the stamina; stigma two, reflex. *Pericarp:* none; calix unchanged. *Seeds:* oblong, length of the calix; pappus capillary, stipitate, with ten rays, hairy at the side. *Receptacle:* chaffy, length of the calix, deciduous. Essential Character. *Calix:* simple. *Pappus:* subplumose. *Receptacle:* chaffy.——The species are,

1. Seriola Lævigata; *Smooth Seriola.* Smoothish: leaves obovate, toothed. Roots perennial, long, twisted, the thickness of the little finger, covered at top with brown scales from the withered petioles; stem none; leaves radical, in a circular cluster, stalked; flowers yellow, solitary, on erect,

slender stalks. It flowers in July and August.—Native of the isle of Candia, and of Barbary, in the clefts of rocks.

2. Seriola Æthnensis; *Rough Seriola.* Hispid: leaves obovate, somewhat toothed. Root annual; stems branched, erect, hairy; flowers yellow.—Native of Italy, and of Barbary, near Mascar.

3. Seriola Cretensis; *Cretan Seriola.* Rough-haired, with runcinate leaves.—Native of the island of Candia or Crete.

4. Seriola Urens; *Stinging Seriola.* Stinging: leaves toothed; stem branched.—Native of Sicily and other parts of the south of Europe.

Seriphium; a genus of the class Syngenesia, order Polygamia Segregata.—Generic Character. *Calix:* perianth double; outer of five roundish, imbricate, tomentose leaflets; inner of five, erect, acuminate, awl-shaped, very smooth, scariose leaflets, twice as long as the others, one-flowered. *Corolla:* one-petalled, funnel-form, shorter than the inner calix; border five-toothed. *Stamina:* filamenta five, capillary; anthera cylindrical. *Pistil:* germen inferior to the corollet, superior to the calix; style filiform; stigma subbifid. *Pericarp:* none; the calix unchanged, closed. *Seed:* solitary, oblong. Essential Character. *Calix:* double, imbricate. *Corolla:* one-petalled, regular. *Seed:* one, oblong, below the corolla.——The species are,

1. Seriphium Cinereum; *Heath-leaved Seriphium.* Flowers whorl-spiked, one-flowered; leaves spreading. Stem upright, branched; spikes fox-tail-like, pale red, interrupted. It flowers from July to September.—Native of the Cape.

2. Seriphium Plumosum; *Feathered Seriphium.* Flowers in spikes, six-flowered; leaves granulate, ovate.—Native of the Cape.

3. Seriphium Fuscum; *Brown Seriphium.* Flowers capitate, one-flowered; leaves linear, awnless, downy; stems distorted, branched, flexuose.—Native of the Cape.

4. Seriphium Ambiguum; *Doubtful Seriphium.* Flowers in spikes, three-flowered; leaves linear. Stem shrubby, procumbent, branched.—Native of the Cape.

Serpicula; a genus of the class Monœcia, order Tetrandria.—Generic Character. *Male. Calix:* perianth minute, four-toothed, erect, acute, permanent. *Corolla:* petals four, oblong, acute, sessile. *Stamina:* filamenta four, very short; antheræ oblong, about equal to the petals. *Female,* on the same plant. *Calix:* perianth superior, minute, in four deep permanent segments. *Corolla:* petals three, or none. *Pistil:* germen inferior, ovate, furrowed; style short; stigmas obtuse. *Pericarp:* nut cylindrical, furrowed, of one cell, deciduous. *Seed:* one, or more, oblong. Essential Character. *Male. Calix:* four-toothed. *Petals:* four. *Female. Calix:* in four deep segments. *Nut:* tomentose.——The species are,

1. Serpicula Verticillata. Leaves in whorls, aculeate-serrate.—Native of India, in standing clear water.

2. Serpicula Repens. Leaves alternate, linear: stem creeping, branched, leafy. The herb has the appearance of Veronica Serpyllifolia, but smaller.—Native of the Cape.

3. Serpicula Occidentalis. Flowers triandrous, hermaphrodite, very small and delicate, white; stigmata ligulate, reflex, bifid; leaves ternate, linear, acute. This plant is called, by Michaux, Elodea Canadensis. Its leaves, when viewed through a microscope, appear very finely serrulate.—It grows in stagnant waters from Canada to Virginia.

Serratula; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common oblong, subcylindrical, imbricate, with lanceolate, acute, or obtuse awnless scales. *Corolla:* compound, tubulous, uniform; corollets hermaphrodite, equal; proper one-petalled, funnel-form; tube bent in; border ventricose, five-cleft. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubulous. *Pistil:* germen obovate; style filiform, length of the stamina; stigmas two, oblong, reflex. *Pericarp:* none; calix unchanged. *Seeds:* solitary, obovate; pappus sessile, feathered. *Receptacle:* chaffy, flat. *Observe.* The pappus in some is plumose, in others only subplumose. *Carduus* is distinguished from this species by its hairy receptacle, ventricose calix, prickly scales, stigma less bifid, and feathered pappus. Essential Character. *Calix:* subcylindrical, imbricate, awnless. *Receptacle:* chaffy or hairy. *Seed-down:* feathery or toothed.——The species are,

1. Serratula Tinctoria; *Common Sawwort.* Leaves serrate, subciliate, lyrate-pinnatifid; terminating lobe very large; florets uniform; pappus somewhat rugged. Root perennial, somewhat woody; stem erect, stiff, and straight. Linnæus called this species Tinctoria, because the Swedes use it as a yellowish dye for coarse woollen cloths.—Native of Europe, in woods, thickets, hedges, and bushy pastures, flowering in July and August.—The Sawworts are hardy perennials, and will thrive in the open air. This species is seldom admitted into gardens as the others are, to be preserved by the curious.

2. Serratula Coronata; *Siberian Sawwort.* Leaves lyrate, pinnatifid; terminating pinna very large; florets of the ray female, longer. It flowers in July and August.—Native of Italy, Silesia, and Siberia.

3. Serratula Japonica; *Japanese Sawwort.* Leaves lyrate, pinnatifid, rugged; calix-scales dilated at the point, and membranaceous.—Native of Japan.

4. Serratula Alpina; *Alpine Sawwort.* Calices somewhat hairy, ovate; leaves undivided, woolly beneath; pappus feathered. Roots slender, though tough and woody, perennial, black on the outside; stems simple, upright, leafy, round, striated, cottony, various in height, crowned with a level-topped tuft of elegant flowers, the florets pink, with blue or violet anthers.—Native of the high mountains of Lapland, Norway, Austria, Switzerland, Silesia, Siberia, Wales, and Scotland, flowering in July and August.

5. Serratula Salicifola; *Willow-leaved Sawwort.* Leaves linear-lanceolate, alternate, hoary beneath, sessile, quite entire; stem angular.—Native of Siberia.

6. Serratula Multiflora; *Many-flowered Sawwort.* Leaves lanceolate, villose underneath, subdecurrent, quite entire; calices cylindrical. Stem angular, corymbed, with the branches again corymbed; flowers more or less numerous, rose-coloured.—Found in Siberia, Silesia, and China.

7. Serratula Noveboracensis; *Long-leaved Sawwort.* Leaves lanceolate, oblong, serrate, pendulous; root perennial; stalks several.—Native of North America.

8. Serratula Prœalta; *Tall Sawwort.* Leaves lanceolate-oblong, serrate, spreading, hirsute beneath; root large, perennial, fibrous; stem branching, from four to seven or eight feet high; flowers pale purple.—Native of North America.

9. Serratula Glauca; *Glaucous-leaved Sawwort.* Leaves ovate-oblong, acuminate, serrate; flowers corymbed; calices roundish; root perennial. It flowers in October.—Native of Maryland, Virginia, and Carolina. See the next species.

10. Serratula Squarrosa; *Rough-headed Sawwort.* Leaves linear; calices squarrose, subsessile, acuminate, lateral; root tuberous, from which comes out a single stalk rising nearly three feet high.—Native of Virginia, and most of the provinces of North America. It flowers in July and August.—This, the ninth, eleventh, and fourteenth species, have large knobbed roots, and are propagated only by seeds, which seldom ripen in England, so that they must be procured from abroad. Sow them on a border with an eastern aspect, where the sun comes only in a morning, for they seldom

succeed well if exposed to the mid-day sun. If sown early in the spring they will often grow in the first summer, but will sometimes remain a year in the ground before the plants appear; so that if they should not come up in the first season the ground should not be disturbed, and must be kept free from weeds till the following spring, when, if the seeds were good, the plants will come up, and must be weeded and thinned where too close. Some of them should be drawn out carefully while they are young, and planted into another border of light loamy earth, four inches asunder; in this place they may remain till autumn, when these, and also those in the seed-beds, should be carefully removed to places where they are designed to remain: the following summer these plants will flower, and the roots will abide several years, if they are planted in a light loamy soil, not over wet. The other perennial sorts may be propagated by parting the roots; the best time for doing this is in autumn, when their stalks begin to decay; for when they are removed in the spring, if the season should prove dry, their roots will not be sufficiently established to flower well the same year. They should not be removed nor parted oftener than every third year, if they are expected to grow strong; nor should they be parted into small heads, which can make no figure in the first year. As they grow tall, plant them in the middle of large borders, or with other tall plants: they may be planted in large spaces between shrubs, or on the borders of woods, where they will have a good effect during their continuance in flower; and as they require no other culture than to dig the ground between them every spring, and to keep them clean from weeds, so they are proper for such places. These plants are also propagated by seeds, when they can be obtained good; these may be sown in the same way as the bulbous-rooted kinds, and, when the plants come up, they must be treated in the same manner, only that they should be allowed more room, for the fibres of their roots spread out on every side to a great distance; for which reason these plants should not be planted in small gardens, where they will overbear the neighbouring plants.

11. Serratula Scariosa; *Ragged-cupped Sawwort.* Leaves lanceolate, quite entire; calices squarrose, peduncled, obtuse. Root large, tuberous, from which comes out one strong channelled stalk three or four feet high; flowers purple, in a long loose spike.—Native of Virginia.

12. Serratula Pilosa; *Hairy-leaved Sawwort.* Leaves linear, hairy; flowers axillary, on long peduncles. It flowers in September and October.—Native of North America.

13. Serratula Speciosa; *Hairy-cupped Sawwort.* Leaves linear, sickled; flowers sessile, spiked; calicine leaflets rough-haired, acute, the inner ones elongated, coloured at the point. It flowers in October.—Native of Carolina, &c.

14. Serratula Spicata; *Spiked Sawwort.* Leaves linear, ciliate at the base; flowers in spikes, sessile, lateral; stem simple.—Native of North America.

15. Serratula Amara; *Bitter Sawwort.* Leaves lanceolate; calicine scale scariose, at the point blunt patulous, coloured; flowers terminating; stems angular.—Root perennial, bitter, with a saline flavour.—Native of Siberia.

16. Serratula Centauroides; *Centaury-like Sawwort.* Leaves pinnatifid, oblique, acute, smooth, unarmed; calicine scales mucronate, the inner ones scariose; corolla purple, without any marginal florets.—Native of Siberia.

17. Serratula Mucronata; *Pointed-cupped Sawwort.* Smooth: leaves entire, lanceolate; stem few-flowered; calicine scales scariose at the point, acuminate, reflex; plant very smooth.—Native of Barbary, near Mascar, flowering early in spring.

18. Serratula Humilis; *Dwarf Sawwort.* Leaves pinnatifid, tomentose beneath; head simple, one-flowered; calix-leaves subulate, loose.—Native of Sicily and Barbary. It is a very handsome little perennial, flowering in the summer.

19. Serratula Scordium. Leaves lanceolate, serrate, half-embracing; flowers fastigiate; root creeping; stem herbaceous, perennial.—Native of China and Cochin-china.

20. Serratula Arvensis; *Corn Sawwort, Way Thistle,* or *Cursed Thistle.* Leaves sessile, pinnatifid, spiny; stem panicled; calices ovate, spinulose. This species is too well known by its perennial creeping roots, which, striking down to a great depth, constitutes it one of the worst pests of arable lands; and it is very difficult to get the roots out where they have once got possession, as the smallest piece will grow. Frequent and deep ploughing in dry weather will destroy this Thistle in arable land, but common ploughing is not deep enough to answer the purpose. In pastures it should be pulled or rather forked out, when the ground is well soaked with wet. Frequent mowing or spudding, if they do not destroy, are sometimes found to enfeeble it: they seem however to make it run more at the root; but even to prevent it from flowering is something, and there is no method so good as that first above stated. A variety sometimes occurs with few or no spines on the leaves, which also are not so deeply indented, and are either green on both sides, or whitish underneath. The goat and ass will eat it; horses will sometimes crop the heads when young and tender: cattle do not seem to touch it. It is said to yield a very pure vegetable alkali when burnt.—This Thistle is known every where by road-sides, and too frequently in corn-fields, especially in strong lands and in pastures, but not so common there: flowering from June to August. This plant is more properly a *Cnicus* than a *Serratula.*

Sesamum; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, five-parted, erect, equal, very short, permanent; segments lanceolate, the upper ones shorter. *Corolla:* one-petalled, bell-shaped; tube roundish, almost the length of the calix; throat inflated, spreading, bell-shaped, very large, declined; border five-cleft; segments four patulous, almost equal, and a fifth, which is the lowest, longer, ovate, straight. *Stamina:* filamenta four, springing from the tube, shorter than the corolla, ascending, setaceous, the two inner shorter, with the rudiment of a fifth filamentum; antheræ oblong, acute, erect. *Pistil:* germen ovate, hirsute; style filiform, ascending, a little longer than the stamina; stigma lanceolate, two-parted; lamellæ parallel. *Pericarp:* capsule oblong, obscurely four-cornered, compressed, acuminate, four-celled. *Seeds:* very many, subovate. *Observe.* It has the flower of *Digitalis,* but the fruit is very different. Essential Character. *Calix:* five-parted. *Corolla:* bell-shape, five-cleft, the lower lobe larger; rudiment of a fifth filamentum. *Stigma:* lanceolate, divided. *Capsule:* four-celled.——The species are,

1. Sesamum Orientale; *Oriental Sesamum,* or *Oily Grain.* Leaves ovate-oblong, entire; flowers in loose terminating spikes, small, of a dirty white colour, shaped somewhat like those of the Foxglove. A tender annual; the stem erect, two feet high, round, branched, leafy; leaves opposite, stalked; capsule erect, beaked, an inch long. This species is frequently cultivated in the Levant, and also in Africa, as a pulse: an oil is extracted from the seeds, which oil will keep many years without acquiring any rancid taste or smell, but in two years becomes quite mild; so that when the warm taste of the seed, which is in the oil when first drawn, is worn off, it is used as a salad oil, and for all the purposes of sweet oil. The

seeds are also used by the negroes for food: they parch them over the fire, then mix them with water, and stew other ingredients with them. A pudding is made with them in Carolina, where the seeds have been introduced by the African negroes, in the same manner as with Rice or Millet. In Carolina it is cultivated with great success, and it is computed there that nine pounds of the seed yield upwards of two pounds of the neat oil, which they find to grow more mellow and agreeable with age, and to continue without any rancid smell or taste for many years. In Japan, where they have no butter, they use the oil for frying fish, and in dressing other dishes; as a varnish; and medicinally as a resolvent and emollient: and in China and Cochin-china it is used for the same purposes.—These plants are preserved in gardens as botanic curiosities. Their seeds must be sown in the spring upon a hot-bed, and when they come up should be transplanted to another hot-bed, to bring them forward. After they have acquired a tolerable degree of strength, they should be planted into pots filled with a rich light sandy soil, and plunged into a third hot-bed, managing them as directed for Amaranthus: for if they are not thus brought forward in the former part of the summer, they will not produce good seeds in this country; though after they have flowered, if the season is favourable, they may be exposed in a warm situation with other annuals. After perfecting seeds, the plants die.

2. Sesamum Indicum; *Indian Sesamum*, or *Oily Grain*. Lower leaves trifid; upper undivided; stem erect.—Native of the East Indies, Mauritius, &c. This and the above were introduced into Jamaica by the Jews, and they are now cultivated in most parts of the island. They are there called *Vanglo*, or *Oil-plant:* the Europeans use the seeds in broths, but the Jews make them chiefly into cakes. Many of the oriental nations look upon the seeds as a hearty wholesome food, and express an oil from them not unlike nor inferior to the oil of almonds. A decoction of the leaves and buds is esteemed a good resolutive, and frequently ordered in inflammations of the eyes, where warm fomentations become requisite. There is a variety, which is a native of Africa, all the leaves of which are cut into three parts.

3. Sesamum Luteum; *Yellow Sesamum*. Leaves lanceolate, on long petioles; corollas hispid on the outside, deep yellow.—Found in the East Indies.

Seseli; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* umbel universal rigid; partial very short, manifold, globular; involucre universal of very few leaves, or none; partial of one or two leaflets, linear, acuminate, length of the umbellet; proper perianth scarcely observable. *Corolla:* universal uniform; florets all fertile; partial of five inflex-cordate petals, flattish. *Stamina:* filamenta five, awl-shaped; antheræ simple. *Pistil:* germen inferior; styles two, distant; stigmas blunt. *Pericarp:* none; fruit ovate, small, striated, bipartite. *Seeds:* two, ovate, convex, and striated on one side, flat on the other. Essential Character. *Umbels:* globular. *Involucre:* of one or two leaflets. *Fruit:* ovate, striated. Sow the seeds of these plants in autumn, and they will rise in the following spring; whereas when they are sown in the spring they frequently lie in the ground till the next year before they grow. Drill them eighteen inches asunder, in a bed of fresh earth, where they are designed to remain; thin the plants to the distance of six inches; keep them clear from weeds, and in the second season they will produce seeds. The perennial sorts should have the ground gently dug between the roots every spring, taking care not to injure them with the spade. They delight in a moist soil, and will therefore require watering in one that is dry.——The species are,

1. Seseli Filifolium; *Thread-leaved Meadow Saxifrage*. Leaves filiform; stem flexuose, erect; perianth awl-shaped. —Native of the Cape.

2. Seseli Pimpinelloides; *Nodding Meadow Saxifrage*. Stem declined; umbels before they flower nodding. Root perennial; seeds oval, with three raised streaks.—Native of the south of Europe.

3. Seseli Montanum; *Long-leaved Meadow Saxifrage*. Petioles branch-bearing, membranaceous, oblong, entire; stem-leaves very narrow. Stem erect, about two feet high; flowers white.—Native of France and Italy, on dry hills.

4. Seseli Striatum; *Furrowed Meadow Saxifrage*. Petioles branchy, membranaceous, emarginate; stem striated; pinnas awl-shaped, grooved.—Native of the Cape.

5. Seseli Glaucum; *Glaucous Meadow Saxifrage*. Petioles branch-bearing, membranaceous, oblong, entire; leaflets single and in pairs, channelled, even, longer than the petiole. Root perennial, running deep into the ground, and sending out slender smooth stalks nearly two feet high.—Native of France, Austria, and Italy.

6. Seseli Aristatum; *Bearded-leaved Meadow Saxifrage*. Petioles branchy, submembranaceous, loose, quite entire; leaves superdecompound; leaflets lanceolate, awned; fruits ovate. Stems strong, a foot and half high, with shining pinnate leaves, and terminated by pretty large umbels of whitish flowers.—Native of the Pyrenean Mountains.

7. Seseli Annuum; *Annual Meadow Saxifrage*. Petioles branchy, membranaceous, ventricose, emarginate; stem stiff, a span high and more, striated.—Native of France, Germany, Hungary, Austria, Switzerland, and Piedmont.

8. Seseli Chærophylloides; *Chervil-leaved Meadow Saxifrage*. Petioles branchy, membranaceous, ventricose, entire; stem dichotomous, panicled; leaves superdecompound, smooth. —Native of the Cape.

9. Seseli Ammoides; *Milfoil-leaved Meadow Saxifrage*. Root-leaves with the leaflets imbricate. The stalks rise about a foot high, and sustain a small umbel of white flowers, which appear in June and July.—Native of Portugal and Italy.

10. Seseli Tortuosum; *Crooked Meadow Saxifrage*. Stem lofty, rigid; leaflets linear, in bundles. Biennial.—Native of the south of France.

11. Seseli Gummiferum; *Gummy Meadow Saxifrage*. Stem furrowed, rigid, leafy; partial involucrum of many linear leaves, united by a broad base; flowers almost sessile; leaflets wedge-shaped. Stem three feet high. Biennial, hardy, flowering in summer and autumn.—Grows in the Crimea.

12. Seseli Turbith. Universal involucre one-leafed; seeds striated, villose, styled.—Native of the south of Europe.

13. Seseli Hippomarathrum; *Various-leaved Meadow Saxifrage*. Involucrets connate, one-leafed.—Native of Austria, Carniola, Silesia, and Germany.

14. Seseli Pyrenæum; *Pyrenean Meadow Saxifrage*. Leaves doubly pinnate; leaflets gashed, acute; involucrets bristle-shaped, longer than the umbellet. Stem a foot high, round, striated.—Native of the Pyrenees.

15. Seseli Saxifragum. Stem filiform, divaricating; leaves doubly ternate, linear; umbels of about six rays.—Native of Germany, and near the lake of Geneva.

16. Seseli Elatum. Leaves superdecompound, the upper ones only ternate. It is easily distinguished by its cylindrical leaflets, coming out in threes, and from one to two inches in height.—Native of France, Austria, and Silesia.

17. Seseli Triternatum. Leaves triternate; leaflets long-linear; umbels hemispherical; involucels polyphyllous; leaflets linear, of the length of the umbels; flowers deep yellow. —Grows about the waters of Columbia river. The fusiform

root of this species is one of the grateful vegetables of the Indians: they use it baked or roasted.

Sesuvium; a genus of the class Icosandria, order Trigynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, bell-shaped, five-parted; segments ovate, acute, coloured within, shrivelling. *Corolla:* none. *Stamina:* filamenta very many, awl-shaped, inserted into the calix below the segments, and shorter than the calix; antheræ roundish. *Pistil:* germen oblong, in the bottom of the calix, three-cornered above; styles often three, capillary, erect, length of the stamina; stigmas simple. *Pericarp:* capsule ovate, three-celled, cut round. *Seeds:* roundish, flattish, having a beak at the margin. ESSENTIAL CHARACTER. *Calix:* five-parted, coloured. *Petals:* none. *Capsule:* ovate, three-celled, cut round, many-seeded.——The species are,

1. Sesuvium Portulacastrum. Leaves wedge-shaped, on very short petioles, opposite, obtuse, fleshy, thick, smooth, bright green; root perennial; stems herbaceous, four or five inches long, decumbent, subdivided, round.—Native of the West Indies; very common in Jamaica, in all the low lands about the Ferry, growing in thick beds, on every spot of ground that rises above the level of the water. It is very succulent, and full of a neutral alkalescent salt, which may be easily extracted, and would probably answer all the purposes for which the salts of the Kali are now used.

2. Sesuvium Revolutifolium. Stems square; leaves ovate-oblong, reflexed; flowers sessile.—Native of Cuba.

Shaddock. See *Citrus.*

Shallot. See *Allium.*

Shawia; a genus of the class Syngenesia, order Polygamia Segregata, or, according to Forster, Monogamia.—GENERIC CHARACTER. *Calix:* perianth imbricate, cylindrical; scales five or six, oblong, three inner longer, almost equal. *Corolla:* one-petalled, funnel-form, short; border five-cleft, linear, spreading. *Stamina:* filamenta five, capillary; anthera cylindrical, tubular. *Pistil:* germen oblong; style filiform, longer than the corolla; stigma bifid, spreading. *Pericarp:* none; calix unchanged, pervious. *Seed:* solitary, oblong. *Down:* capillary, pubescent at the base. *Receptacle:* naked. ESSENTIAL CHARACTER. *Calix:* imbricate, with five or six scales, three interior longer. *Corolla:* tubular, five-cleft. *Seed:* one, oblong.——The only known species is,

1. Shawia Paniculata.—Native of New Zealand.

Sheep's Scabious. See *Jasione.*

Sheffieldia; a genus of the class Pentandria, order Monogynia. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Corolla:* bell-shaped. *Filamenta:* ten, the alternate ones barren. *Capsule:* one-celled, five-valved, many-seeded. *Observe.* This genus is now sunk into *Samolus.*——The only known species is,

1. Sheffieldia Repens. This is a little procumbent creeping plant, so resembling *Peplis Portuca*, that without the fructification it would seem to be the same.—Native of New Zealand and Easter Island.

Shepherd's Needle. See *Scandix.*

Shepherd's Purse or *Pouch.* See *Thlaspi.*

Shepherd's Staff. See *Dipsacus.*

Sherardia; a genus of the class Tetrandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth small, six-toothed, superior, permanent. *Corolla:* one-petalled, funnel-form; tube cylindrical, long; border four-parted, flat, acute. *Stamina:* filamenta four, placed at the top of the tube; antheræ roundish, two-lobed. *Pistil:* germen twin, oblong, inferior; style filiform, bifid at top; stigmas headed. *Pericarp:* none; fruit oblong, crowned, separable longitudinally into two parts. *Seeds:* two, oblong, marked at the apex with three points, convex on one side, flat on the other. ESSENTIAL CHARACTER. *Corolla:* one-petalled, funnel-form, superior. *Seeds:* two, three-toothed.——The species are,

1. Sherardia Arvensis; *Blue Sherardia,* or *Little Field Madder.* All the leaves in whorls; flowers terminating; root annual, with many reddish-brown fibres. The whole plant diffused, rough, and hairy, from four to seven inches high; corolla with a long slender tube, the border bright purple.—Native of Europe, among corn and on fallows; flowering during the greater part of summer.

2. Sherardia Muralis; *Wall Sherardia.* Stems diffuse; leaves four in a whorl, or in pairs, spreading; whorls two-flowered; stalks of the fruit reflexed. Root annual; stems decumbent.—Native of Italy and of Turkey.

3. Sherardia Fruticosa; *Shrubby Sherardia.* Leaves in fours, equal; stem shrubby. This is a torose, irregular, rugged shrub; branches bluntly four-cornered; corolla white. One of the very few plants found on the island of Ascension.

Sibbaldia; a genus of the class Pentandria, order Pentagynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, half ten-cleft, with an erect base; segments half lanceolate, equal, spreading, alternately narrower, permanent. *Corolla:* petals five, ovate, inserted into the calix. *Stamina:* filamenta five, capillary, shorter than the corolla, inserted into the calix; antheræ small, obtuse. *Pistil:* germina five, ovate, very short; styles from the middle of one side of the germina, length of the stamina; stigmas headed. *Pericarp:* none; calix converging, concealing the seeds within its bosom. *Seeds:* five, somewhat oblong. *Observe.* It sometimes, but very seldom, becomes luxuriant, by doubling the number of pistilla on the same plant. ESSENTIAL CHARACTER. *Calix:* ten-cleft. *Petals:* five, inserted into the calix. *Styles:* from the side of the germen. *Seeds:* five.——The species are,

1. Sibbaldia Procumbens; *Procumbent Sibbaldia.* Stem procumbent; leaves three-toothed, wedge-form. Root perennial, woody, branched, black on the outside.—Native of the mountains of Lapland, Siberia, Switzerland, and Scotland: in the last it is found plentifully on the north side of Ben Lomond, three-fourths up the mountains, and sparingly upon Ben Mor. It flowers in July. It grows upon moist ground, and is difficult to preserve in gardens, and rarely produces seed there; the plants therefore must be procured from the places where they grow naturally; and if planted in a moist soil and a shady situation, they will thrive tolerable well, and produce flowers.

2. Sibbaldia Erecta; *Upright Sibbaldia.* Stem upright; leaves linear, multifid; flowers flesh-coloured.—Native of Siberia, in mountainous places.

3. Sibbaldia Altaica. Stem upright; leaves linear-filiform, three-parted. Height of the stems about three inches, slender, and slightly leafy. It has only one flower, or else is terminated by a corymb of from three to five flowers.—Found by Pallas on the rocks of Dauria.

Sibthorpia; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, turbinate, five-parted, spreading; segments ovate, permanent. *Corolla:* one-petalled, five-parted, spreading, equal, length of the calix; segments rounded. *Stamina:* filamenta four, capillary, two approximating; antheræ cordate-oblong. *Pistil:* germen roundish, compressed; style cylindrical, thicker than the filamenta, length of the flower; stigma simple, capitate, depressed. *Pericarp:* capsule compressed, orbicular, two-bellied, with the sides acute, two-valved, two-celled; partition transverse. *Seeds:* few, roundish-oblong, convex on one side, flat on the other, inserted into a globular receptacle, fastened to the middle of the partition. ESSEN-

TIAL CHARACTER. *Calix:* five-parted. *Corolla:* five-parted, equal. *Stamina:* in remote pairs. *Capsule:* compressed, orbicular, two-celled, with the partition transverse.——The only known species is,

1. Sibthorpia Europæa; *Cornish Moneywort.* Root fibrous, perennial; stems prostrate, creeping, branched, very long, slender and delicate, interwoven, leafy, hairy; leaves alternate, stalked, horizontal, kidney-form, crenate, hairy, somewhat fleshy, half an inch broad, paler and veiny beneath; flowers axillary, solitary. It flowers in July and August, or from June to September.—Native of Portugal and England, in shady places and about springs: plentiful in Devonshire and Cornwall, and about Longsledale in Westmoreland. If planted or sown in pots, placed in the shade and kept moist, it will thrive very well in gardens.

Sicyos; a genus of the class Monœcia, order Syngenesia. —GENERIC CHARACTER. *Male Flowers. Calix:* perianth one-leafed, bell-shaped, five-toothed; toothlets awl-shaped. *Corolla:* five-parted, bell-shaped, fastened to the calix; segments ovate. *Stamina:* filamenta three, united; antheræ as many, separate. *Female Flowers,* on the same plant. *Calix:* perianth as in the male, superior, deciduous. *Corolla:* as in the male. *Pistil:* germen ovate, inferior; style cylindrical; stigma thickish, trifid. *Pericarp:* berry ovate, set with spines, one-celled. *Seed:* single, subovate. ESSENTIAL CHARACTER. *Male. Calix:* five-toothed. *Corolla:* five-parted. *Filamenta:* three. *Female. Calix:* superior, five-toothed. *Corolla:* five-parted. *Style:* trifid. *Berry:* one-seeded.——The species are,

1. Sicyos Angulata; *Angular-leaved Sicyos,* or *Single-seeded Cucumber.* Leaves angular. This is an annual plant, which rises with two large seed-leaves like those of the Cucumber. The stalk is trailing, and has tendrils by which it fastens itself to neighbouring plants, and will rise fifteen or sixteen feet high, dividing into many branches, with angular leaves upon them like those of the Cucumber. The flowers come out upon long peduncles from the side of the branches in clusters; the females are small, of a pale sulphur colour, and appear in June and July; they are succeeded by prickly oval fruit, ripening in autumn.—Native of North America. If the seeds be permitted to scatter, the plants will come up in the spring better than when sown by hand, and only require weeding. They ramble, and take up too much room in small gardens, and should therefore be placed near hedges, upon which they will climb. They do not bear transplanting well, except when they first come up.

2. Sicyos Laciniata; *Jagged-leaved Sicyos.* Leaves jagged. This is annual plant like the former, with trailing stalks. The flowers are larger, and of a deeper colour. The fruit is not quite so large, nor so closely armed with prickly hairs.—Native of the West Indies. Sow the seeds, and treat them as Cucumbers and Melons.

3. Sicyos Garcini; *Garcin's Sicyos.* Leaves five-parted, erose, toothed; fruits ciliate.—Native of Ceylon.

4. Sicyos Parviflora. Leaves five-angled, minutely toothed, smooth, heart-shaped. Annual.—Native of Mexico.

Sida; a genus of the class Monadelphia, order Polyandria. —GENERIC CHARACTER. *Calix:* perianth one-leafed, angular, half five-cleft, permanent. *Corolla:* petals five, wider above, emarginate, fastened below to the tube of the stamina. *Stamina:* filamenta very many, united below into a tube, in the apex of the tube divided; antheræ roundish. *Pistil:* germen orbicular; styles five or more, or else one many-cleft; stigmas headed. *Pericarp:* capsule roundish, angular, composed of five or more cells, (corresponding with the number of styles or stigmas,) two-valved, awnless, acuminate or horned, opening above, or close, and finally separating. *Seeds:* solitary, two, three, or five, roundish, mostly acuminate, convex on one side, angular on the other, fastened to the interior suture. ESSENTIAL CHARACTER. *Calix:* simple, angular. *Style:* in numerous divisions. *Capsule:* of several bivalve cells, spreading from a centre.—The habit of this genus of plants is more or less shrubby, though several have annual roots: the leaves are alternate, stalked, and simple; inflorescence mostly axillary; flowers yellow, reddish, or white. Some of the species will not flower the first year, and must be placed in a warm stove in autumn, and treated during the winter as other tender plants from the East and West Indies. The following summer they will flower and produce ripe seeds; but being not of long duration in general, there should be a succession of young plants raised from seed. They are many of them annual in England; but some are of a longer duration in their native country, and might be so here if they were placed in a warm stove in winter. They are propagated by seeds, which should be sown upon a moderate hot-bed in the beginning of April; and when the plants are fit to remove, they must be placed in another hot-bed, planting them four inches distant every way: they must be shaded from the sun till they have taken new root, and have a large share of free air admitted to them in mild weather, to prevent them from drawing up weak; they will also often require watering. If the plants thrive well, they will have strength enough to be fit to transplant in the open air; for which purpose they should be gradually hardened, and at the beginning of June may be taken up with balls of earth to their roots, and planted in a warm sheltered part of the garden, at about three feet distance, observing to shade and water them until they have taken new root, after which they will only require weeding. In July the plants will begin to flower, and there will be a succession of flowers till the frost comes on. In warm seasons they will ripen their seeds very well in autumn; but lest they should miscarry by the unfavourableness of the season, it may be proper to put one plant of each sort in pots filled with light kitchen-garden earth, placing them in the shade till they are again rooted, and then they may be removed to a warm situation, where they will thrive very well in a good season; but if the summer proves cold, they should be placed in a dry airy glass-case, where they may be kept warm, to facilitate the ripening of their seeds.——The species are,

* *With long, narrow, lanceolate, oblong, and ovate Leaves.*

1. Sida Linifolia; *Flax-leaved Sida.* Leaves linear, quite entire; racemes terminating; capsules almost awnless.—Native of Peru and the island of Cayenne.

2. Sida Angustifolia; *Narrow-leaved Sida.* Leaves linear-lanceolate, toothed; peduncles subsolitary, axillary; capsules with beaked valves. This rises with a slender woody stalk, about two feet high, sending out many erect branches.—Native of Brazil and the island of Bourbon. Perennial.

3. Sida Acuta; *Sharp-leaved Sida.* Leaves linear-lanceolate, toothed; peduncles solitary, axillary; capsules two-cusped; stipules lanceolate.—Native of Java.

4. Sida Canariensis; *Canary Sida.* Leaves lanceolate, sublinear, toothed, smooth; peduncles solitary, axillary, length of the leaves; capsules two-beaked.—Native of the Canary Islands.

5. Sida Lanceolata; *Lance-leaved Sida.* Leaves oblong-lanceolate, toothed, smoothish; peduncles axillary, solitary; capsules two-beaked; stipules linear, nerved, longer than the peduncle.—Native of Ceylon and the Mauritius.

6. Sida Spinosa; *Prickly Sida.* Leaves ovate-lanceolate, obsoletely cordate-toothed; peduncles subsolitary, axillary;

axils somewhat spiny; stipules bristle-shaped, longer than the peduncle; capsules two-beaked.—Native of the East Indies, Arabia Felix, Senegal, Guiana, and Jamaica.

7. Sida Frutescens; *Shrubby Sida.* Leaves ovate-oblong, serrate; peduncles one-flowered, axillary; capsules two-beaked.—Native place unknown.

8. Sida Carpinifolia; *Hornbeam-leaved Sida.* Leaves ovate-oblong, subduplicate, serrate; peduncles axillary, four-flowered or thereabouts; capsules two-beaked.—Cultivated in the island of Madeira.

9. Sida Jamaicensis; *Jamaica Sida.* Leaves ovate, serrate, tomentose; flowers axillary, subpeduncled; capsules in fives, two-horned. The leaves and tender buds of this species contain a great quantity of mucilage, and lather with water like soap: it is frequently used in shaving-washes, by those who dislike the acrimony of soap. The leaves are purgative.—It is called Broom-weed in Jamaica, where it is very common in all parts of the island.

10. Sida Orientalis; *Oriental Sida.* Leaves ovate, acuminate, toothed, smooth; peduncles one-flowered, axillary; capsule awnless.—Native of the East Indies.

11. Sida Glomerata; *Globe-flowered Sida.* Leaves ovate-lanceolate, serrate; flowers about five together, axillary, subsessile; capsules two-horned.—Native place uncertain.

12. Sida Maculata; *Spotted-flowered Sida.* Leaves ovate, obtuse, serrate, tomentose; peduncles axillary, racemed at the top of the stem; capsules two-horned; corolla middle-sized, yellow.—Native of the West Indies.

13. Sida Tuberosa; *Corky Sida.* Leaves ovate-toothed, hirsute; peduncles axillary, one-flowered, twice as long as the petiole; capsules two-horned; stem corky at the base.—Native of Hispaniola.

14. Sida Capensis; *Cape Sida.* Leaves ovate, lanceolate, toothed; peduncles solitary; stipules linear, ciliate, longer than the petiole.—Native of the Cape.

15. Sida Microphylla; *Small-leaved Sida.* Leaves elliptic, toothed; peduncles solitary, longer than the petiole; capsules two-horned.—Native of the East Indies.

16. Sida Micans; *Glittering Sida.* Leaves ovate-obtuse, serrate, tomentose, shining; peduncles solitary, longer than the petiole; capsules two-horned.—Native of the West Indies.

17. Sida Pusilla; *Dwarf Sida.* Prostrate: leaves roundish, elliptic, toothed, smooth; peduncles longer than the petiole, solitary; capsules awnless.—Native of the island of Mahe.

** *With wedge-shaped Leaves.*

18. Sida Rhombifolia; *Rhomb-leaved Sida.* Leaves oblong-lanceolate, toothed, wedge-form at the base, quite entire; peduncles much longer than the petioles; capsules two-horned.—Native of the East Indies and Jamaica.

19. Sida Canescens; *Hoary-leaved Sida.* Leaves rhomb-ovate, toothed at top, tomentose beneath; peduncles longer than the leaf.—Native of Senegal.

20. Sida Retusa; *Retuse-leaved Sida.* Leaves obovate, toothed at the end, and retuse-tomentose beneath; peduncles solitary, longer than the leaf; capsules awnless.—Native of Tranquebar, Amboyna, the Philippines, the Mauritius, &c.

21. Sida Alnifolia; *Alder-leaved Sida.* Leaves roundish-obovate, toothed, quite entire at the base; peduncles many, axillary, shorter than the leaf; capsules two-horned.—Native of the East Indies.

22. Sida Ciliaris; *Ciliated Sida.* Leaves lanceolate, truncate, toothed, somewhat wedge-shaped at the base; stipules linear, ciliate, longer than the flower; flowers solitary, subsessile; capsules awnless, muricate. This little creeping plant, seldom above seven inches high, is common in Jamaica.

*** *With cordate, quite entire Leaves.*

23. Sida Periplocifolia; *Great Bindweed-leaved Sida.* Leaves cordate-lanceolate, acuminate, quite entire, tomentose beneath; peduncles subdivided, longer than the petiole; capsules awned.—Native of Peru. It is a lofty shrub.

24. Sida Excelsior; *Tall Sida.* Leaves cordate, ovate, acuminate, quite entire, tomentose beneath; racemes panicled; capsules two-toothed.—Native of Hispaniola.

25. Sida Hermandioides; *Hermandia-leaved Sida.* Leaves subpeltate, cordate, ovate-acuminate, almost quite entire, pubescent; peduncles one-flowered; capsules awnless.—Native of Peru and St. Domingo.

26. Sida Nudiflora; *Naked-flowered Sida.* Leaves roundish-cordate, acuminate, almost quite entire, tomentose beneath; panicle terminating, racemed; capsules awnless.—Native of the West Indies.

**** *With cordate toothed Leaves, and one-flowered Peduncles.*

27. Sida Triquetra; *Triangular-stalked Sida.* Leaves cordate, acuminate, serrulate; peduncles solitary; capsules awnless, truncate; branches three-sided. One seed in each capsule.—Native of Hispaniola.

28. Sida Fragrans; *Sweet Sida.* Leaves roundish-cordate, acuminate, crenate, hirsute, viscid; peduncles solitary, shorter than the petiole; capsules two, bristled.—Native of Hispaniola.

29. Sida Lignosa; *Woody Sida.* Leaves roundish-cordate, acuminate, crenate, tomentose; peduncles solitary, longer than the petiole; capsules awnless, seven or eight, very hard, three-seeded.—Native of St. Domingo.

30. Sida Reflexa; *Reflex-flowered Sida.* Leaves roundish-cordate, acuminate, crenate, tomentose; peduncles solitary, longer than the petiole; petals wedge-form, toothed at the end, and reflexed.—Native of Peru.

31. Sida Humilis; *Low Sida.* Leaves roundish-cordate, hairy above, serrate; peduncles subsolitary, longer than the petiole; capsules awnless.—Native of the East Indies.

32. Sida Repens; *Creeping Sida.* Leaves roundish-cordate, toothed, hispid on both sides; peduncles solitary, longer than the petiole; stem filiform, prostrate.—Native of Peru, in shady places about Lima.

33. Sida Bivalvis; *Two-valved Sida.* Leaves ovate-cordate, acuminate, crenate, tomentose; peduncles solitary, shorter than the petiole; calices awn-acuminate; capsules cohering, two-toothed.—Native of St. Domingo.

34. Sida Ulmifolia; *Elm-leaved Sida.* Leaves ovate-cordate, acuminate, crenate; peduncles solitary, almost equal to the petiole; capsules beaked; beaks long, hooked, standing far out.—Native of St. Domingo.

35. Sida Multiflora; *Many-flowered Sida.* Leaves ovate-cordate, bluntish, toothed, tomentose; peduncles solitary, longer than the petiole; capsules two, beaked; fruit within the calix.—Native of Brazil.

36. Sida Microsperma; *Small-seeded Sida.* Leaves roundish, cordate, acute, subcrenate; peduncles subsolitary, shorter than the petiole; capsules two-beaked; seeds small.—Native place not ascertained.

37. Sida Viscosa; *Clammy Sida.* Leaves ovate-cordate, acuminate, very finely serrate, tomentose, viscid, hairy; peduncles subsolitary, longer than the petiole; capsules awnless. The whole plant is clammy, and smells strong. It seldom rises above three or four feet in height.—Native of Jamaica and Cochin-china.

38. Sida Fœtida; *Stinking Sida.* Leaves roundish-cordate, sharpish, toothed, tomentose; peduncles solitary, shorter than the petiole; capsules awned.—Native of Peru.

39. Sida Calicina; *Calicine Sida.* Leaves roundish-cor-

date, acuminate, repand, toothed; peduncles solitary, longer than the petiole; capsules awnless, pear-shaped.—Native of the Isle of Bourbon.

40. Sida Crispa; *Curled Sida.* Leaves oblong-cordate, acuminate, crenate, the upper ones sessile; peduncles solitary, longer than the petiole, the fruiting ones bent down; capsules inflated, awnless, waved, and curled. Annual.—Native of Carolina and the Bahama Islands, flowering from July to September.

41. Sida Persica; *Persian Sida.* Lower leaves petioled, cordate, acuminate, upper sessile, lanceolate, toothed; peduncles solitary, one-flowered; capsules many, without beaks.—Native of Persia.

42. Sida Sylvatica; *Wood Sida.* Leaves ovate-cordate, acuminate, crenate; peduncles geminate, much longer than the petiole; capsules awnless, headed.—Native of Peru, in woods, near the river Maragnon.

43. Sida Arborea; *Tree Sida.* Leaves orbicular-cordate, crenate, tomentose; peduncles axillary, solitary, single-flowered, longer than the petiole; capsules awnless, truncate; stem arboreous. This small tree is remarkable for its large bell-shaped, sulphur-coloured flowers.—Native of Peru.

44. Sida Mauritiana; *Mauritius Sida.* Leaves roundish-cordate, acuminate, toothed, tomentose beneath; peduncles solitary, longer than the petiole; capsules two-beaked, truncate, longer than the calix. Annual.—Found in the Mauritius.

45. Sida Occidentalis; *Downy Sida.* Leaves oblong-cordate, toothed, sublobed; peduncles solitary, shorter than the petiole; capsules obtuse, globular, nodding; root annual.—Native of America.

46. Sida Americana; *Woolly Sida.* Leaves cordate, oblong, undivided; capsules many-celled, length of the calix; cells lanceolate. Mr. Miller describes this as the most beautiful species yet known, growing to the height of six or seven feet, and having a smooth woody stem, which puts out many lateral branches towards the top.—Native of Jamaica, and La Vera Cruz.

47. Sida Abutilon; *Broad-leaved Sida.* Leaves roundish-cordate, acuminate, toothed, tomentose; peduncles axillary, solitary, shorter than the petiole; capsules two, awned, truncate. This is an annual plant; the stem much branched; the flowers yellow. It is hardy enough to come up in the common ground, and to perfect its seeds without any trouble; but will not bear transplanting, except when very young; the seeds therefore are best sown where the plants are intended to remain, and, if permitted to fall, they will appear without any care in the following spring. In some parts of America it is called *Marsh Mallow.*—Native of both Indies, Virginia, and Siberia.

48. Sida Abutiloides. Leaves cordate, undivided, acuminate, crenate; peduncles length of the petioles; capsules ten, three-seeded; stem firm, straight, round, branched, four feet high. It is an elegant annual plant, thickly covered with a whitish green woolly nap.—Native of Jamaica.

49. Sida Asiatica; *Small-flowered Sida*, or *Indian Mallow.* Leaves oblong-cordate, toothed; peduncles solitary, longer than the petioles; capsules acute, truncate, almost equal to the calix.—Native of the East Indies.

50. Sida Populifolia; *Poplar-leaved Sida.* Leaves roundish-cordate, acuminate, unequally repand, toothed; peduncles solitary, longer than the petiole; capsules acute, truncate, longer than the calix.—Native of the East Indies.

51. Sida Hirta; *Rough-haired Sida.* Leaves roundish-cordate, acuminate, toothed; peduncles solitary, longer than the petiole; capsules truncate, shorter than the calix. The flowers sometimes have a dark purple eye.—Native of the East Indies.

52. Sida Indica; *Rough-capsuled Sida.* Leaves oblong-cordate, bluntish, unequally toothed; peduncles longer than the petiole; capsules awnless, globular, aggregate, rugged, longer than the calix.—Native of the East Indies, Tanna, and New Caledonia.

53. Sida Mollissima; *Soft-leaved Sida.* Leaves roundish-cordate, acuminate, toothed; peduncles subbiflorous, longer than the petiole, solitary; capsules two-toothed, truncate, equal to the calix.—Native of Peru, in woods, near the river Maragnon.

54. Sida Sonneratiana; *Sonneret's Sida.* Leaves roundish-cordate, acuminate, toothed; peduncles solitary, longer than the leaf; capsules truncate, obtuse, larger than the calix.—Native of the Cape.

55. Sida Pubescens; *Pubescent Sida.* Leaves roundish-cordate, acuminate, angular-toothed; peduncles solitary, longer than the petiole; capsules two-toothed, truncate, larger than the calix.—Native of St. Domingo.

56. Sida Althæfolia; *Marshmallow-leaved Sida.* Leaves cordate, somewhat angular, obtuse, serrate, crenate, tomentose on both sides; beaks of the seeds shorter than the calix.—Native of Jamaica and Hispaniola.

57. Sida Glutinosa; *Glutinous Sida.* Leaves roundish-cordate, acuminate, toothed; peduncles geminate, subbiflorous, longer than the petiole; capsules two-awned; awns longer than the calix.—Native of the island of Mauritius.

58. Sida Exstipularis; *Unstipuled Sida.* Leaves ovate-cordate, acuminate; peduncles solitary, shorter than the petiole; capsules awnless, shorter than the calix, less than thirty in number, one-seeded.—Native of the Isle of Bourbon.

59. Sida Nutans; *Nodding Sida.* Leaves oblong-cordate, acute, toothed; peduncles subgeminate, longer than the petiole, the flowering ones nodding; capsules obtuse. This species is singular for the internal appendices of the cells.—Native of Peru.

60. Sida Borbonica; *Bourbon Island Sida.* Leaves roundish-cordate, acute, toothed; peduncles solitary, longer than the petiole; capsules two-awned; awns longer than the calix.—Native of the island of Bourbon.

61. Sida Flavescens; *Yellow Sida.* Leaves ovate, cordate, obtuse, unequally toothed; peduncles geminate, subbiflorous, shorter than the petiole; capsules acute.—Native of Brazil.

62. Sida Radicans; *Rooting Sida.* Leaves roundish-cordate, acute, ciliate, toothed; peduncles solitary, longer than the petiole; capsules awnless.—Native of the East Indies.

63. Sida Arguta; *Sharp-leaved Sida.* Leaves cordate-serrate, attenuated at the top; stem wand-like; peduncles axillary, filiform, one-flowered.—Native of Jamaica.

64. Sida Multicaulis; *Many-stalked Sida.* Leaves roundish-cordate, acute, toothed; peduncles solitary, double the length of the petiole; capsules awnless, five, much less than the calix.—Native of Malabar.

65. Sida Pilosa; *Hairy Sida.* Leaves ovate-cordate, obtuse, toothed; peduncles solitary, longer than the petiole; capsules two-beaked, shorter than the calix. It varies with hairy or smooth stems.—Native of St. Domingo.

66. Sida Rotundifolia; *Round-leaved Sida.* Leaves roundish-ovate-cordate, obtuse, toothed; peduncles solitary, much longer than the petiole; capsules two-awned; awns longer than the calix.—Native of the island of Bourbon.

67. Sida Supina; *Trailing Sida.* Leaves roundish-cordate, bluntish, crenate; peduncles solitary, longer than the petiole; capsules two-awned; stem procumbent, filiform, unarmed; flowers pale yellow. Perennial.—Native of Hispaniola.

68. Sida Truncata; *Truncate-leaved Sida.* Leaves round-

ish-cordate, blunt and truncate at the top, and toothed; peduncles solitary, longer than the petiole; capsules awnless, nine in number. It is an annual plant.—Native of St. Domingo.

69. Sida Herbacea; *Herbaceous Sida.* Leaves oblong-acute, toothed, cordate at the base; peduncles solitary, a little shorter than the petiole; capsules two-awned; stem upright, hairy, branched.—Native of the East Indies.

70. Sida Emarginata; *Notch-leaved Sida.* Leaves ovate-lanceolate, cordate, toothed, truncate, and retuse at the top; peduncles shorter by half than the petiole; capsules two-beaked. Two feet high. Annual.—Native of Hispaniola.

71. Sida Alba; *White-flowered Sida.* Leaves oblong-cordate, rounded, obtuse, toothed; peduncles equal to the petiole; capsules two-horned.—Native of Bengal.

72. Sida Cordifolia; *Heart-leaved Sida.* Leaves ovate-cordate, toothed, somewhat angular, bluntish; peduncles solitary, a little shorter than the petiole; capsules two-beaked; root annual.—Native of the East Indies and the Cape.

73. Sida Hederæfolia; *Ivy-leaved Sida.* Leaves roundish-cordate, obtuse, repand; peduncles longer than the petiole; capsules two-awned; stem prostrate, creeping; root annual. —Native of St. Domingo.

***** *With cordate, toothed Leaves; and many-flowered, or racemed Peduncles.*

74. Sida Verticillata; *Whorled Sida.* Leaves ovate-cordate, acuminate, toothed; flowers subsessile, aggregate, whorled; capsules almost awnless.—Native of Brazil.

75. Sida Urens; *Stinging Sida.* Leaves ovate-cordate, acuminate, toothed; peduncles axillary, many-flowered, glomerate; capsules awnless.—Native of Jamaica.

76. Sida Umbellata; *Umbellate Sida.* Leaves roundish-cordate, toothed, somewhat angular, acute; peduncles four-flowered or thereabouts, umbelled, axillary; capsules two-awned, three-seeded. Annual.—Native of Jamaica.

77. Sida Pyramidata; *Pyramidal Sida.* Leaves roundish-cordate, acuminate, serrate; peduncles corymbed, subpanicled; capsules two-awned.—Native of St. Domingo.

78. Sida Paniculata; *Panicled Sida.* Leaves ovate-cordate, toothed, downy; racemes panicled; capsules two-beaked; corollas dark purple, with the petals spreading.—Native of the calcareous rocks of Jamaica, Peru, and Brazil.

79. Sida Dumosa; *Bushed Sida.* Leaves cordate-ovate, acuminate, serrate, smooth on both sides; flowers panicled. —Found in dry coppices, in Jamaica.

80. Sida Ramosa; *Branched Sida.* Leaves ovate-cordate, unequally toothed; racemes axillary; capsules two-awned, six in number.—Native of Senegal.

81. Sida Spicata; *Spiked Sida.* Leaves ovate-cordate, acute, toothed; raceme terminating, naked; capsules awnless, in heads, larger than the calix, numerous, one-seeded, squeezed into a ball.—Native of St. Domingo.

82. Sida Terminalis; *Terminal-stalked Sida.* Leaves ovate-lanceolate, cordate, toothed; raceme terminating, elongated, bracted; capsules awnless, in heads, larger than the calix; villose, three-seeded.—Native of Brazil.

****** *With cordate Leaves, three-cusped, or angular at the base.*

83. Sida Vesicaria; *Bladder Sida.* Leaves ovate-cordate, toothed, three-cusped; peduncles solitary, axillary, longer than the petiole; capsules truncate, awnless, sharpish, ten, five-seeded; fruit inflated.—Native of Mexico.

84. Sida Crassifolia; *Thick-leaved Sida.* Leaves ovate-cordate, toothed, somewhat three-cusped; peduncles solitary, axillary, length of the petioles; capsules two-awned, tomentose all over, with a strong smell.—Native of Hispaniola.

85. Sida Biflora; *Two-flowered Sida.* Leaves ovate-cordate, acuminate, toothed, three-cusped; peduncles geminate, axillary, equal to the petiole; capsules several. It is a shrubby plant.—Native place not ascertained.

86. Sida Obtusa; *Blunt-leaved Sida.* Leaves cordate-ovate, obtuse, toothed, three-cusped; peduncles longer than the petiole, bearing about four flowers in an umbel; capsules acute, three-seeded.—Native place unknown.

87. Sida Gigantea; *Giant Sida.* Leaves roundish-cordate, crenate, acuminate, three-cusped; flowers panicled; corollas reflexed.—Native of the Caraccas.

88. Sida Javensis; *Javanese Sida.* Leaves roundish-cordate, toothed, three-cusped; peduncles solitary, axillary, longer than the petiole; capsules two-cusped; stem reclined. —Native of Java.

89. Sida Hastata; *Halbert-leaved Sida.* Lower leaves cordate, acuminate, five-cornered, somewhat toothed, obtuse; upper hastate; peduncles solitary, axillary, length of the leaves; capsules several, acuminate, connate at the base. Annual or biennial.—Native of Mexico and Lima.

90. Sida Cristata; *Crested Sida.* All the leaves crenate; lower roundish-cordate, obtuse, somewhat five-cornered; upper rounded, hastate, acuminate; peduncles solitary, axillary, longer than the leaves; root annual.—Native of Mexico.

91. Sida Dilleniana; *Dillenius's Sida.* Lower leaves triangular, subhastate, crenate; upper ovate, lanceolate, almost quite entire; peduncles solitary, axillary, length of the leaves. Annual.—Native of Mexico.

******* *With lobed Leaves, palmate, or compound.*

92. Sida Triloba; *Three-lobed Sida.* Leaves cordate, toothed, three-lobed, with the middle lobe acute and longer; peduncles axillary, solitary; capsules awnless; corolla white. —Native of the Cape.

93. Sida Ternata; *Three-leaved Sida.* Leaves ternate; leaflets lanceolate, remotely serrate.—Native of the Cape.

94. Sida Pterosperma; *Wing-fruited Sida.* Leaves three-parted; segments linear, repand, sinuate; flowers subracemed; capsules winged. Annual.—Native of Peru.

95. Sida Ricinoides; *Ricinus-leaved Sida.* Leaves subpeltate, five-lobed; lobes ovate, acute, toothed, undivided; peduncles one or two flowered; capsules two-awned; seeds one-grooved. Annual.—Native of Peru.

96. Sida Jatrophoides; *Jatropha-like Sida.* Leaves subpeltate, seven-lobed, palmate; lobes lanceolate, acuminate, pinnatifid, toothed; panicle many-flowered, hairy; capsules two-awned. An annual stove plant, flowering in August, and distinguished by the deep lobes of its leaves.—Found in the province of Chaucayo in Peru.

97. Sida Phyllanthus. Stemless: leaves ternate; leaflets sessile, three-parted, wedge-form, quite entire, undivided, obtuse; flower solitary, inserted into a winged petiole. Perennial.—Native of Peru.

Sideritis; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, oblong, about half five-cleft; segments acute, almost equal. *Corolla:* one-petalled, almost equal; tube cylindrical, oblong; throat oblong, roundish; upper lip erect, bifid, narrow; lower lip trifid; lateral segments sharper, commonly smaller than the upper lip; middle segments roundish, crenate. *Stamina:* filamenta four, within the tube of the corolla, shorter than the throat, two of which are smaller; antheræ roundish, two twin. *Pistil:* germen four-cleft; style filiform, rather longer than the stamina; stigmas two; upper cylindrical, concave, truncate; lower membranaceous, shorter, sheathing the upper. *Pericarp:* none; calix cherishing the seeds in its bosom. *Seeds:* four. Essential Character.

Calix: five-cleft. *Corolla:* ringent; upper lip bifid; lower three-parted. *Stamina:* within the tube of the corolla; the shorter stigma involving the other. Most of the plants of this genus are hardy enough to thrive in the open air in England; and are propagated by seeds, which may be sown in shallow drills upon a dry spot of ground; and in the spring, when the plants come up, they must be freed from weeds, and drawn out when fit to be removed, and transplanted into a bed at about nine or ten inches' distance, which will give those that are left in the seed-bed room to grow. The plants removed should be shaded and watered until they have taken new root, after which they will require no other care but to keep them clean from weeds till the following autumn, and then to transplant them where they are to remain. None of the species should be planted in a rich ground, for that will cause them to grow so luxuriantly in summer, that the frost or much wet will destroy them in winter.——The species are,

1. Sideritis Canariensis; *Canary Ironwort.* Shrubby, villose: leaves cordate, oblong, acute, petioled; spikes whorled, before flowering nodding; branches divaricate, covered with a soft down. Stem five or six feet high; leaves green above, elegantly edged with white, finely crenate, rather shaggy, more thickly clothed beneath. The flowers, which grow in thick whorled spikes at the end of the branches, are of a dirty white, and appear early in June; it also frequently flowers in autumn.—Native of the Canaries, and of Madeira. This species is generally kept in green-houses, but will live abroad in moderate winters, if screened from hard frost upon a warm dry border under a common frame. It is propagated by seeds, which should be sown in autumn, for those which are sown in the spring seldom succeed, or, if they do, seldom come up in the first year.

2. Sideritis Candicans; *Mullein-leaved Ironwort.* Shrubby, tomentose: leaves ovate-lanceolate, cordate, attenuated at top, snow-white beneath; whorls about eight-flowered, remote. It flowers from April to July.—Native of Madeira.

3. Sideritis Cretica; *Cretan Ironwort.* Shrubby, tomentose; leaves cordate-oblong, obtuse, petioled; branches divaricating; spikes whorled.—Native of Crete.

4. Sideritis Montana; *Mountain Ironwort.* Herbaceous, without bractes: calices larger than the corolla, spiny; upper lip trifid. In rocky situations it is upright, in meadows decumbent.—Native of Italy, Austria, and Silesia, flowering in July and August. This and the next species being annuals, ought not to be removed, but thinned and weeded, and left in the place where they were sown.

5. Sideritis Elegans; *Dark-flowered Ironwort.* Herbaceous, without bractes, villose; stem diffused; segments of the calices almost equal, spinulose. It flowers in July.—Native place unknown. See the preceding species.

6. Sideritis Romana; *Roman Ironwort.* Herbaceous, decumbent, hairy, without bractes: calices spiny; upper lip ovate. Tube and upper lip of the corolla pale red; lower lip white, dilated. The roots seldom continue above two years in England.—Native of the south of Europe, and of Barbary. This and the next species, though properly green-house plants, will often live through the winter in the open air, especially if their seeds are sown upon dry rubbish; for when they happen to grow in the joints of old walls they will endure the greatest cold of this climate.

7. Sideritis Syriaca; *Sage-leaved Ironwort.* Suffruticose, tomentose, woolly: leaves lanceolate, almost quite entire; flowers whorled, spiked, acute, tomentose. Stem erect, mostly simple, a foot high. Perennial.—Native of Italy. This does not produce good seeds in England; and is therefore propagated by slipping off the heads and planting them in a shady border during the spring or summer months. They will readily take root, and should be screened in winter.

8. Sideritis Taurica; *Tartarian Ironwort.* Suffruticose, tomentose: leaves lanceolate, crenate; flowers whorl-spiked; whorls approximating; bractes cordate, acuminate, netted, nerved.—Native of the Chersonese Taurica.

9. Sideritis Distans; *Distant-whorled Ironwort.* Suffruticose, hoary: leaves lanceolate, quite entire, acute; flowers whorl-spiked; whorls distant; bractes cordate, acuminate, mucronate, netted, nerved.—Native of the Levant.

10. Sideritis Perfoliata; *Perfoliate Ironwort.* Herbaceous, hispid, hairy: upper leaves lanceolate, embracing, tooth-letted; bractes cordate, acuminate, netted, nerved, hairy at the edge; stem upright.—Native of the Levant.

11. Sideritis Ciliata; *Ciliated Ironwort.* Herbaceous: leaves petioled, ovate, serrate; bractes nerved, ciliate. Stem four-cornered, erect, branched.—Native of Japan.

12. Sideritis Incana; *Lavender-leaved Ironwort.* Suffruticose, tomentose: leaves lanceolate-linear, quite entire; bractes toothed; lateral lobes of the upper lip of the corolla acute. The habit of this plant is much like Lavender. Whorls distant, four or five in a spike; calix clothed with white cottony down; corolla twice as long as the calix, yellow, white, or pale blue. It varies with the lower leaves linear-spatulate, and the upper linear; also with the lower linear, and the upper oblong or spatulate; lastly, with the leaves quite entire and subcordate.—Native of Spain.

13. Sideritis Virgata; *Rod-like Ironwort.* Suffruticose, tomentose: leaves linear, quite entire; bractes toothed; lateral lobes of the upper lip of the corolla obtuse.—Native of Barbary, on the sandy hills near Mascar.

14. Sideritis Glauca; *Glaucous Ironwort.* Herbaceous, perennial, pubescent, hoary: leaves linear-spatulate, quite entire; bractes toothed; lateral lobes of the lower lip of the corolla acute.—Native of Valencia in Spain.

15. Sideritis Hyssopifolia; *Hyssop-leaved Ironwort.* Leaves lanceolate, smooth, quite entire; bractes cordate, tooth-spiny; calices equal. Stem short, woody, with branches a foot and half long.—Native of Switzerland, Italy, and the Pyrenees.

16. Sideritis Scordioides; *Crenated Ironwort.* Leaves lanceolate, somewhat toothed, smooth above; bractes ovate, tooth-spiny; calices equal. Root perennial; stems a foot long. It flowers from August to November.—Native of the south of France.

17. Sideritis Spinosa; *Thorny Ironwort.* Hirsute: leaves lanceolate, pointed with strong spinous teeth; as well as the reticulated heart-shaped bractes.—Native of Spain, in Castile and Arragon.

18. Sideritis Hirsuta; *Hairy Ironwort.* Leaves oblong, obtuse, toothed, hairy; bractes tooth-spiny; stems hirsute, decumbent.—Native of the south of Europe.

19. Sideritis Ovata; *Ovate-leaved Ironwort.* Herbaceous, pubescent: leaves petioled, elliptic obtuse, crenate; spike four-cornered; bractes ovate, tooth-spiny. Perennial.—Native of Peru.

20. Sideritis Lanata; *Woolly Ironwort.* Herbaceous, diffuse, hairy: leaves cordate, obtuse, villose; calices awnless, woolly; spike long; stem erect; root annual.—Native of Palestine and Egypt.

Siderodendrum; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, very small, four-toothed, acute, placed on the germen. *Corolla:* one-petalled; tube cylindrical, curved in, long; border four-cleft; segments oblong, obtuse, flat,

reflexed, shorter by half than the tube. *Stamina:* filamenta four, very short, arising below the divisions of the border; antheræ oblong, erect. *Pistil:* germen roundish, inferior; style filiform, length of the tube of the corolla; stigma oblong, obtuse, thickish. *Pericarp:* berry two-lobed, crowned with the calix, two-celled, with the partition contrary. *Seeds:* solitary, on one side convex and wrinkled, on the other flat, margined, fastened to the partition. ESSENTIAL CHARACTER. *Corolla:* one-petalled, salver-shaped. *Calix:* four-toothed. *Berry:* two-lobed, two-celled. *Seeds:* solitary. ——The only known species is,

1. Siderodendrum Triflorum. A tall branching tree. Leaves ovate-lanceolate, acute, quite entire, shining, petioled, opposite, half a foot long; flowers small, rose-coloured on the outside, white within; branches smooth, below round, above slightly four-cornered, compressed at the top. The corolla is often changed, perhaps by some insect, into an oblong bag, half an inch in length, fleshy, hollow within, ending in a point at top, and having the appearance of a fruit.—Found in the mountain woods of Martinico, Montserrat, &c.

Sideroxylum; a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth five-cleft, small, erect, permanent. *Corolla:* one-petalled, wheel-shaped; segments five, roundish, concave, erect; toothlet cusped, serrate at the base of each division of the petal, tending inwards. *Stamina:* filamenta five, awl-shaped, length of the corolla, alternate with the toothlets; antheræ oblong, incumbent. *Pistil:* germen roundish; style awl-shaped, length of the stamina; stigma simple, obtuse. *Pericarp:* roundish, one-celled. *Seed:* five. *Observe.* The teeth are wanting in the corolla of some species, as in the first and third; and the ninth differs in having ten stamina. ESSENTIAL CHARACTER. *Corolla:* five-cleft. *Nectary:* in most five-leaved. *Stigma:* simple. *Berry:* five-seeded. These plants are all propagated from seeds procured from abroad, and sown in pots filled with light rich earth, and plunged into a good hot-bed in the spring, in order to get the plants forward early in the season. When they are fit to transplant, they should be each put into a separate small pot filled with good earth, and plunged into a fresh hot-bed while they are young. In winter they must be plunged into the tan-bed in the stove, and treated in the same manner as has been directed for tender plants from the same countries. As they obtain more strength, they may be treated more hardily, by placing them in a dry-stove in the winter, and giving them a greater share of free air in summer. When they are strong, they may be placed abroad in summer in a sheltered situation. Mr. Miller propagated them by layers, which were two years before they had made good roots; and sometimes they will take from cuttings; but this is a very uncertain method, nor do they when so raised grow so vigorously as those from seeds.——The species are,

1. Sideroxylum Mite; *Harmless Ironwood.* Unarmed: leaves acute; flower sessile.—Native of Africa.

2. Sideroxylum Inerme; *Smooth Ironwood.* Unarmed: leaves perennial, obovate; peduncles round. The flowers come out in clusters at the sides of the branches, upon short footstalks, which branch out into several smaller, each sustaining a single flower, which is small and white. The wood is so heavy as to sink in water, and, being very close and hard, has obtained the name of Ironwood.—This tree is a native of the Cape of Good Hope, where it rises to the height of an English Apple-tree. Like all others of this genus, it cannot be preserved in England, unless placed in a moderate stove.

3. Sideroxylum Melanophlœum; *Laurel-leaved Ironwood.* Unarmed: leaves perennial, lanceolate; peduncles angular. This tree bears a great resemblance to the preceding. There are no teeth between the stamina.—Native of the Cape.

4. Sideroxylum Cymosum. Unarmed: leaves opposite, petioled; cymes compound and decompound. A small shrub.—Native of the Cape.

5. Sideroxylum Sericeum; *Silky Ironwood.* Unarmed: leaves ovate, tomentose, silky beneath. Corolla villose externally; style slender, hairy at the base.—Native of New South Wales.

6. Sideroxylum Argenteum; *Silvery Ironwood.* Unarmed: leaves ovate, retuse, tomentose; flowers peduncled.—Native of the Cape.

7. Sideroxylum Tomentosum; *Downy Ironwood.* Unarmed: leaves oblong, acuminate, obtuse, the younger ones tomentose; peduncles aggregate, axillary, length of the petiole. A small tree.—Native of the East Indies, chiefly on the tops of mountains.

8. Sideroxylum Lycioïdes; *Willow-leaved Ironwood.* Spiny: leaves elliptical, deciduous. A small tree, with minute greenish flowers.—Native of Canada.

9. Sideroxylum Decandrum. Spiny: leaves deciduous, elliptic. This, if not a variety, bears a strong resemblance to the preceding.—Native of South America.

Sigesbeckia; a genus of the class Syngenesia, order Polygamia Superflua.—GENERIC CHARACTER. *Calix:* common, exterior five-leaved; leaflets linear, round, spreading very much, longer than the flower, permanent; interior subquinquangular; leaflets many, ovate, concave, obtuse, equal. *Corolla:* compound, half radiate; corollets hermaphrodite, many in the disk; female five or fewer in the ray, only on one side of the flower. Proper of the hermaphrodite, funnel-form, exceeding the calix in length, five-toothed or three-toothed; female ligulate, wide, three-toothed, very short, or funnel-shaped, trifid, the interior division deeper. *Stamina:* in the hermaphrodites; filamenta five or three, very short; antheræ cylindrical, tubular. *Pistil:* in the hermaphrodites, germen oblong, curved in, size of the calix; style filiform, length of the stamina; stigma bifid. In the females, germen oblong, curved in, size of the calix; style filiform, length of the hermaphrodite; stigma bifid. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites, solitary, oblong, obtusely four-cornered, thicker above, obtuse, naked; pappus none. In the females, very like the others. *Receptacles:* chaffy; chaffs very like the scales of the calix, concave, wrapping up the seeds on one side, and deciduous. ESSENTIAL CHARACTER. *Calix:* exterior, five-leaved; inner spreading. *Ray:* halved. *Pappus:* none. *Receptacle:* chaffy.——The species are,

1. Sigesbeckia Orientalis; *Oriental Sigesbeckia.* Petioles sessile; exterior calices linear, longer than the inner, spreading. Plant annual, nearly four feet high, sending out many branches; flowers terminating, small, yellow. It is remarkable for having the ray of the flower on one side, as in Milleria. When the ripe seeds are gathered, they move in the hand as if they were alive. It flowers in July and August.—Native of India, China, and Otaheite. Sow the seeds on a hot-bed, and set out the plants in a warm border at the beginning of June, supplying them with water in dry weather.

2. Sigesbeckia Occidentalis; *American Sigesbeckia.* Petioles decurrent; calices naked. Perennial, flowering in October and November. See *Phæthusa.*

3. Sigesbeckia Flosculosa; *Small-flowered Sigesbeckia.* Floscules three-toothed, the hermaphrodites three-stamined. Stem very much branched, round, slightly striated, somewhat villose, jointed, the thickness of a reed, dusky purple. It is

at first sight distinguished from the first species, by its flosculer-like flowers, and dichotomous diffused branches. Probably it is the only triandrous plant in the Syngenesia class. —Native of Peru, where it is an annual plant, flowering in June and July. It soon ripens its seeds, and may be propagated by them or by cuttings.

Silene; a genus of the class Decandria, order Trigynia.—Generic Character. *Calix:* perianth one-leaved, ventricose, five-toothed, permanent. *Corolla:* petals five; claws narrow, length of the calix, margined; border flat, obtuse, often bifid; nectary composed of two toothlets in the neck of each petal, forming a crown at the throat. *Stamina:* filamenta ten, awl-shaped, five alternately inserted into the claws of the petals, and later than the other five; antheræ oblong. *Pistil:* germen cylindrical; styles three, simple, longer than the stamina; stigmas bent contrary to the sun's apparent motion. *Pericarp:* capsule cylindrical, covered, one or three celled, opening at top into five or six parts. *Seeds:* very many, kidney-form. *Observe.* This genus differs from Cucubalus in the nectareous crown of the corolla. Essential Character. *Calix:* one-leafed, ventricose. *Petals:* five, with claws crowned at the throat. *Capsule:* three-celled. ——The species are,

* *Flowers solitary, lateral.*

1. Silene Anglica; *English Catchfly.* Hirsute, viscid: petals emarginate; flowers lateral, erect, alternate; lower fruits divaricate, reflexed. Root annual, fibrous; stem branched, spreading, flexuose, round, leafy, swelling above each joint, about a foot high; branches somewhat spiked, erect.—Native of England and France, in sandy fields, flowering in June and July. Found about Colchester and Bocking in Essex; Canterbury in Kent; near Devil's Ditch in Cambridgeshire; at Lakenham and Cossey near Norwich; about Coombe wood in Surry; in the corn-fields near Newport in the Isle of Wight; and near Dundee, St. Andrew's, and Perth, in Scotland.—Permit the seeds to scatter, and the plants will come up without further care.

2. Silene Lusitanica; *Portugal Catchfly.* Hirsute: petals toothed, undivided; flowers erect; fruits divaricate, reflexed, alternate.—Native of Portugal and Barbary. Sow the seeds of this, and the fourth, fifth, and sixth species, upon a warm border in autumn.

3. Silene Quinquevulnera; *Variegated Catchfly.* Hirsute: petals roundish, quite entire; flowers lateral, alternate, erect, as well as the fruit. The deep red spot in the centre of the petals gave rise to the trivial name. This species has been long cultivated in our English gardens under the name of Dwarf Lychnis, and may frequently be found naturalized on heaps of rubbish. It continues in flower from June to the end of August, and produces great plenty of seeds, which were formerly sown in drills on the edges of borders, with several other low annual plants. It is a pretty plant, and, according to Hudson, has been found growing in sandy fields about Wrotham in Kent.—Native of the south of Europe, Siberia, and Barbary. Sow the seeds thin upon a border of light earth in autumn; and in the spring, thin the plants to the distance of four inches, and keep them clean from weeds. If some seeds be sown in the spring, they will flower in July; otherwise they flower in May and June.

4. Silene Ciliata; *Fringed Catchfly.* Petals two-parted, obtuse; calices club-shaped, pubescent, ciliate at the tip, alternate, erect. Root simple, perpendicular, filiform; stems somewhat branched, several, ascending, a finger's length, round, pubescent.—Native of Candia.

5. Silene Sericea; *Silky Silene.* Petals bifid; flowers opposite; peduncles erect; leaves oblong, spatulate, silky, hoary; root white, annual, round, not very fibrous.—Native of Piedmont, on the sandy coast.

6. Silene Nocturna; *Spiked Night-flowering Catchfly.* Flowers in spikes, alternate, directed one way, sessile; petals bifid. It flowers in July.—Native of France and Spain.

7. Silene Gallica; *French Catchfly.* Flowers subspiked, alternate, directed one way; petals undivided; fruits erect. Annual.—Native of France and Switzerland.

8. Silene Cerastoides. Hirsute: petals emarginate; fructifications erect; calices subsessile, somewhat hairy.—Native of the south of Europe.

** *Flowers lateral, in clusters.*

9. Silene Mutabilis; *Changeable Catchfly.* Petals bifid; calices angular, peduncled; leaves lanceolate, linear. Annual. —Native of the south of Europe.

10. Silene Chlorantha; *Pale-flowered Catchfly.* Petals linear, bifid; flowers lateral, directed one way, drooping; root-leaves rugged at the edge; root perennial. It is known by the leaves and stems being smooth, and not viscid; the petals narrow, and herbaceous.—Native of Germany.

11. Silene Nutans; *Nottingham Catchfly.* Flowers panicled, directed one way, drooping; petals two-parted, with linear, segments; leaves lanceolate, pubescent. Root somewhat woody, perennial; stems several, herbaceous, erect, a foot or more in height, downy; flowers white, expanding in the evening. It flowers in June and July.—Native of several parts of Europe, chiefly on limestone rocks; also of Barbary, on hills about Algiers. It was first observed at Nottingham castle, but has been found on rocks in Dovedale, Derbyshire; about Knaresborough in Yorkshire; near Gloddaeth in Carnarvonshire, and near North Queen's Ferry, in Scotland.

12. Silene Amœna. Petals bifid; coronet subcoadunate; flowers directed one way; peduncles opposite, three-flowered; branches alternate; stems diffused, smoothish, ascending. Perennial.—Native of Tartary.

13. Silene Paradoxa; *Dover Catchfly.* Flowers panicled, directed one way, drooping; petals obcordate, emarginate; leaves linear-lanceolate, smooth.—Native of Italy; and found on Dover cliffs, whence the name.

14. Silene Maritima; *Sea Campion* or *Catchfly.* Flowers mostly solitary, terminating; petals bifid, crowned; calices smooth, netted, veined. Stems decumbent, leafy, with the extremities only growing upright, and terminating in a handsome white flower. The leaves vary much in breadth. There is a variety with red flowers.—Native of Norway, Gothland, and Britain. Common on many of our coasts; near Southwold in Suffolk; Wells in Norfolk; and upon the shores of Sussex, and greatest part of the western coast. It flowers in August and September.

15. Silene Fruticosa; *Shrubby Catchfly.* Petals bifid: stem shrubby; leaves broad-lanceolate; panicle trichotomous. It flowers in June and July.—Native of Sicily and Germany. This may be increased by slips planted in a shady border; and if the plants be set in a warm dry border, they will live several years without shelter, but in moist ground they frequently rot in winter. It also rises easily from seeds.

16. Silene Bupleuroides; *Hare's-ear-like Catchfly.* Petals bifid; flowers peduncled, opposite, shorter than the bracte; leaves lanceolate, acute, smooth. Root perennial or biennial.—Native of Persia and Mount Atlas. As the seeds do not ripen here, it is difficult to propagate this species. The only way is, to slip off the heads in June, and plant them under a glass; they will take root, if shaded from the sun and duly watered.

17. Silene Longiflora; *Long-flowered Catchfly.* Petals bifid; flowers panicled, erect; peduncles opposite, longer

than the bracte; calices very long, smooth. Root perennial: stems panicled, smooth.—Native of Hungary.

18. Silene Gigantea; *Gigantic Catchfly.* Petals bifid; root-leaves screw-shaped, very blunt; flowers in a sort of whorl. They open only by night.—Native of Africa, Sicily, and Crete. Sow the seeds of this, and the two following species, upon a warm border in autumn; and when they are fit to remove, set them on a dry soil in a warm situation, where they will live through the winter, and in the following summer they will flower, ripen seeds, and decay.

19. Silene Crassifolia; *Thick-leaved Catchfly.* Petals emarginate; leaves suborbiculate, fleshy, hirsute; raceme directed one way; root biennial. It flowers in July and August.—Native of the Cape.

20. Silene Viridiflora; *Green-flowered Catchfly.* Petals cloven half way; leaves ovate, somewhat rugged, acute; the panicle elongated, almost leafless; flowers in loose spikes at the top, of a green colour; root biennial; plant a foot high or more.—Native of Spain, Portugal, and Siberia.

**** Flowers from the forks of the Stem.*

21. Silene Conoidea; *Conoid Catchfly.* Calices of the fruit globular, acuminate, with thirty streaks; leaves smooth; petals entire.—Native of France, Spain, and Italy, among corn. It flowers in June, and the seeds ripen in August.

22. Silene Conica; *Conic* or *Corn Catchfly.* Stem dichotomous; petals bifid; leaves soft; calices of the fruit conical, with thirty streaks; root annual, small, somewhat branched; flowers from the divarications of the stem, solitary, pedicelled, erect, in an evening exhaling a sweet smell like that of the Honeysuckle, but weaker.—Native of Germany, France, Spain, Italy, the Levant, and Barbary. It flowers in July.—Found on the sand-hills near Sandown castle, and at New Romney in Kent.

23. Silene Bellidifolia; *Daisy-leaved Catchfly.* Calices cylindric-conic, pubescent, erect; petals bifid; racemes geminate, terminating, directed one way, the middle flower peduncled; leaves lanceolate, pubescent. Annual.

24. Silene Dichotoma; *Forked Catchfly.* Calices ovate, viscid, hairy, erect; petals bifid; racemes geminate, terminating, directed one way; middle flower peduncled; leaves petioled, ovate-lanceolate, ciliate at the base. This is an annual or biennial plant.—Native of Hungary.

25. Silene Vespertina; *Evening Catchfly.* Calices club-shaped, pubescent, erect; petals bifid; crown connate; racemes geminate, terminating, directed one way; middle flower peduncled; leaves obovate-lanceolate, ciliate at the base; plant annual, rough-haired all over. The flower is flesh-coloured, and open in the evening; stem branched, erect, the branches mostly alternate.—Found on the shores of Sicily, Barbary, Crete, &c.

26. Silene Behen; *Bladder Catchfly.* Calices smooth, ovate, netted-veined; capsules three-celled.—Native of the island of Candia.

27. Silene Stricta; *Stiff Catchfly.* Petals emarginate; calices netted, veined, acuminate, longer than the peduncle; stem dichotomous, stiff. Plant annual.—Native of Spain.

28. Silene Pendula; *Pendulous Catchfly.* Fruiting calices pendulous, inflated; angles ten, rugged. It flowers in May and June. The flowers come out singly from the axils upon short peduncles; they are large, and of a bright red colour, resembling those of the common wild Red Campion.—Native of Sicily, Crete, or Candia.

29. Silene Procumbens; *Procumbent Catchfly.* Calices inflated, with about ten angles, rugged; petals emarginate. Stem procumbent; leaves sessile, linear, lanceolate. Perennial. Weak, tender, and very smooth.

30. Silene Noctiflora; *Forked Night-flowering Catchfly.* Stem dichotomous; petals bifid, obtusely crowned; calices ten-angled; teeth nearly equal to the tube. Root annual, small in proportion to the herb, which often becomes very luxuriant in a manured soil. It flowers in July.—Native of Sweden, Germany, Switzerland, Dauphiny, Piedmont; and in England, in sandy fields in the middle, eastern, and southern counties. In Cambridgeshire it occurs by the road from New Market to Canvass-hall in Wood Ditton; near the turnpike on Newmarket heath; near Catlidge hall, between Snailwell and Chippenham; in Bedfordshire at Oakley Westfield; in Oxfordshire at Headington, Stanton, Harcourt, Cowley, and South Leigh. It flowers in July.—Permit the seeds to scatter, and the plants will come up without further care.

31. Silene Ornata; *Dark-coloured Catchfly.* Calices of the fruit oblong, keeled, hairy; petals hairy, bifid; leaves lanceolate, pubescent, waved; stem ascending. This is a biennial plant, with dark red flowers, somewhat like that of the Clove Pink, in which its beauty chiefly consists, for the plant itself is of rude growth. It grows readily to the height of about two feet, blows freely during most of the summer months, and ripens its seeds. It flowers from May to September.—Native of the Cape. This, and the next species, require the protection of the dry-stove, green-house, or glass-case. They may easily be raised from seeds, but more commonly from cuttings, which strike freely.

32. Silene Undulata; *Wave-leaved Catchfly.* Calices of the fruit subcylindrical, hairy; petals bifid; leaves lanceolate, pubescent, waved; stem ascending. It flowers in August.—Native of the Cape.

33. Silene Virginica; *Virginian Catchfly.* Calices of the flower cylindrical, villose; panicle dichotomous.—Native of Virginia. Perennial, polymorphous.

34. Silene Antirrhina; *Snapdragon-leaved Catchfly.* Leaves lanceolate; peduncles trifid; petals emarginate; calices ovate. Root annual, slender, fibrous. It flowers in June and July.—Native of Virginia and Carolina.

35. Silene Sedoides; *Sedum-like Catchfly.* Glandular, hairy; calices club-shaped; petals emarginate; leaves oblong-obovate, somewhat fleshy. Root annual; stem branching, diffuse.—Native country uncertain.

36. Silene Apetala; *Apetalous Catchfly.* Calices ovate, pubescent; flower apetalous; leaves lanceolate, pubescent. This is an annual plant, differing from all the species of Silene in the flowers being clandestine from the defect of petals; stem round, six inches high, with the branches simple and opposite; capsule shortly pedicelled.

37. Silene Rubella; *Small Red-flowered Catchfly.* Erect, even: calices subglobular, smooth, veined; corollas unopened. Root annual, simple, fibrous, descending straight down. It flowers in May.—Native of Portugal, and Cyprus.

38. Silene Inaperta; *Small Unopen-flowered Catchfly.* Stem dichotomous, panicled; calices even; petals very short, emarginate; leaves smooth, lanceolate. Root annual, fibrous. It flowers in July and August.—Native of the south of Europe; as the county of Nice, Scopoli, and Carniola.

39. Silene Clandestina; *Clandestine Catchfly.* Calices ovate, ten-angled, pubescent; petals bifid, erect, a little longer than the calix; leaves oblong, lanceolate, ciliate.—Native of the Cape.

40. Silene Portensis; *Oporto Catchfly.* Stem dichotomous, panicled; calices striated; petals bifid; leaves linear. It flowers in July and August.—Native of Portugal.

41. Silene Cretica; *Cretan Catchfly.* Erect, even: calices erect, ten-angled; petals bifid; stem dichotomous-panicled, spreading, filiform, with the joints viscid; flower bright

purple, with the petals cloven half way, from upright spreading a little. It flowers from June to August.—Native of Crete or Candia.

42. Silene Muscipula; *Spanish Catchfly.* Petals bifid; stem dichotomous; flowers axillary, sessile; leaves smooth; root annual. The sliminess of this plant is such, says Gerarde, that if you take it in your hands, your fingers will cleave together, as if your hand touched birdlime; and if flies do light upon the same, they will be so entangled that they cannot fly away.—Native of the south of France, Spain, Siberia, and Algiers. Sow the seeds in autumn. When the plants are fit to remove, transplant them into a bed of fresh earth, at six inches' distance, shading and watering them until they have taken new root. Keep them clean from weeds till autumn, and then transplant them to the places where they are designed to remain, for flowering. When the seeds happen to scatter upon a wall, the plants will continue much longer than in the ground.

43. Silene Polyphylla; *Many-leaved Catchfly.* Leaves in bundles, bristle-shaped, on the flowering branches opposite. Root perennial; stems branching, and frequently lying on the ground.—Native of Dauphiny, Hungary, Austria, and Bohemia.

**** *Flowers terminating.*

44. Silene Armeria; *Common* or *Lobel's Catchfly.* Panicles dichotomous, fastigiate, many-flowered; petals emarginate, acutely crowned; upper leaves cordate, smooth. There are three varieties, which generally retain their differences: one has a bright purple flower; the second a pale red, and the third a white flower. Annual. It flowers in July and August.—Native of Denmark, Germany, France, Switzerland, Carniola, and Piedmont. Observed on the banks of the river below the city of Chester.

45. Silene Orchidea; *Orchis-flowered Catchfly.* Petals two-lobed, the borders having on each side of the base an awl-shaped process; leaves even, the lower roundish, spatulate; petioles ciliate. Root annual; stem erect, dichotomous. It flowers in May and June.—Native of the Levant.

46. Silene Egyptiaca; *Egyptian Catchfly.* Petals emarginate, toothed on both sides; leaves subtomentose. Stem herbaceous, a palm high, brachiate, very slightly tomentose; flowers terminating.—Native of Egypt.

47. Silene Catesbœi; *Catesby's Catchfly.* Calices cylindrical; petals four-cleft, acute; panicle terminating; leaves lanceolate.—Native of Carolina.

48. Silene Cordifolia; *Heart-leaved Catchfly.* Calices pubescent, angular, cylindrical; petals bifid; flowers terminating; leaves roundish, acute, nerved, hairy. Root fibrous, perennial. This plant is viscid all over.—Native of the higher rocks of Piedmont, the county of Nice, and the Col de Tende.

49. Silene Chlorœfolia; *Armenian Catchfly.* Calices smooth, club-shaped; petals semibifid; leaves glaucous, lower oval, upper cordate, embracing; root probably perennial.—Native of Armenia.

50. Silene Alpestris; *Austrian Catchfly.* Petals four-toothed; stem dichotomous; capsules ovate-oblong; leaves linear-lanceolate, smooth, erect; peduncles viscid. Root perennial.—Native of the mountains of Austria. This, and the three following species, may be propagated by seeds or cuttings. They are all hardy.

51. Silene Rupestris; *Rock Catchfly.* Flowers erect; petals emarginate; calices round; leaves lanceolate. It flowers from June to August.—Native of Lapland, Sweden, Germany, Dauphiny, Piedmont, and Siberia.

52. Silene Saxifraga; *Saxifrage Catchfly.* Stems one-flowered; peduncles length of the stem; leaves smooth; flowers hermaphrodite and female; petals bifid. Root woody, branched. It is a creeping plant, with the branches commonly simple and viscid. It flowers from June to August.—Native of France, Italy, Carniola, and Japan.

53. Silene Vallesia; *Woolly-leaved Catchfly.* Stems one-flowered, decumbent; leaves lanceolate, tomentose, length of the calix. The flowers grow erect, are of a pale red colour, and are succeeded by turgid capsules, filled with roundish seeds. It flowers from June to August.—Native of the higher Alps, of the Vaudois, the Valais, and Dauphiny. The seeds of this should be sown in dry rubbish, where they will remain several years, but in a rich moist soil they seldom survive the winter.

54. Silene Pumilio; *Dwarf Mountain Catchfly.* Stems one-flowered, two-leaved; petals repand; leaves linear, lanceolate. Root perennial.—Native of the mountains of Italy, Moravia, and Carinthia.

55. Silene Acaulis; *Stemless Catchfly,* or *Moss Campion.* Stemless: leaves linear, ciliate at the base; peduncles solitary, one-flowered; petals emarginate. The root is perennial, forms a thick tuft, and descends far into the earth; the leaves are bright green, crowded, half an inch to an inch long; the flowers pink, with a violet calix. It flowers from May to July.—Native of the mountains of Lapland, Denmark, Britain, Germany, Dauphiny, Austria, Piedmont, Switzerland, and the Pyrenees: on the highest mountains of Devonshire, Wales, and Scotland; as, on Ben Lomond, Isles of Mull, Rum, and Skye.

56. Silene Hispida; *Hairy Catchfly.* Flowers racemed, clustered, directed one way; calices very hirsute; petals bifid.—Native of Mount Atlas.

57. Silene Imbricata; *Imbricate-flowered Catchfly.* Stem hairy below; leaves lanceolate; flowers sessile, directed one way, stiff, in long racemes, imbricate. Annual.—Native of Barbary, in the fields near Mascar.

58. Silene Tridentata. Hirsute: leaves narrow, lanceolate; flowers racemed, distinct, sessile; teeth of the calix awl-shaped; capsules acuminate, erect.—Found in Spain, and in the corn-fields near Algiers.

59. Silene Reticulata; *Netted Catchfly.* Smooth, viscid: leaves narrow, lanceolate; peduncles two or three flowered; calix club-shaped, netted; petals linear, emarginate; stem erect, smooth, branched, viscid, slender.—Native of Algiers.

60. Silene Bipartita; *Cloven-petalled Catchfly.* Lower leaves spatulate; flowers racemed, directed one way, nodding; petals two-parted; stem pubescent, jointed, erect, or else decumbent at the base, branched. This is a very handsome annual species.—Found in Barbary, flowering during spring.

61. Silene Pseudo-atocion. Lowest leaves obovate; flowers in bundles, terminating; calices club-shaped; petals linear, quite entire. Stems often many from the same tuft. Annual.—Native of Mount Atlas.

62. Silene Ramosissima; *Branched Catchfly.* Pubescent, viscid, very much branched: leaves narrow, lanceolate; peduncles from one to three flowered; calices ovate; petals bifid; capsules subsessile, within the calix. Perennial.—Found on the sand, by the coast of Barbary.

63. Silene Arenaria; *Sandwort Catchfly.* Villose, viscid: leaves linear, lanceolate, bluntish; flowers loosely racemed; petals bifid; capsules within the calix, pedicelled.—Native of the sandy shores of the Mediterranean.

64. Silene Arenarioides; *Sandwort-like Catchfly.* Pubescent: leaves narrow, linear; peduncles from one to three flowered; calices ten, striated, villose; petals bifid; capsules round, pedicelled.—Native of Barbary.

65. Silene Cinerea; *Ash-coloured Catchfly.* Lower leaves ovate; flowers racemed, subsessile, solitary, two or three together; calix pubescent, ten-streaked; petals bifid.—Native of the fields about Algiers.

66. Silene Patula; *Spreading Catchfly.* Viscid: branches panicled, spreading; lower leaves on long petioles, ovate, acuminate; peduncles subtriflorous; calix elongated; petals semibifid. Stem erect, pubescent below, branched. The flowers open at sunset, and then smell very pleasantly. Perennial.—Native of Barbary, in fields.

Silk Cotton. See *Bombax.*

Silphium; a genus of the class Syngenesia, order Polygamia-Necessaria.—Generic Character. *Calix:* common ovate, imbricate, squarrose; scales ovate-oblong, bent back in the middle, prominent every way, permanent. *Corolla:* compound radiate; corollets hermaphrodite, in the disk many; females in the ray fewer. Proper of the hermaphrodites one-petalled, funnel-form, five-toothed; the tube scarcely narrower than the border: of the females lanceolate, very long, often three-toothed. *Stamina:* in the hermaphrodite; filamenta five, capillary, very short; anthera cylindrical, tubular. *Pistil:* in the hermaphrodites; germen round, very slender; style filiform, very long, villose; stigma simple: in the females, germen obcordate; style simple, short; stigmas two, bristle-shaped, length of the style. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites none: in the females, solitary, submembranaceous, obcordate, with the edge membranaceous, two-horned, emarginate. *Receptacle:* chaffy; chaffs linear. Essential Character. *Calix:* squarrose. *Seed:* down margined, two-horned. *Receptacle:* chaffy.—Fifteen species have been described; they are hardy, herbaceous, perennial plants, having the aspect of Sunflowers; with opposite, whorled, or alternate leaves, and yellow flowers. They may be increased by parting the roots in the same manner as is practised for the perennial Sunflower: the best time for this is in autumn, when the stalks begin to decay. Treat them afterwards in the same way as the perennial Sunflower. ——The following are a sample of the species,

1. Silphium Laciniatum; *Jagged-leaved Silphium.* Leaves alternate, pinnate-sinuate. Root perennial; stem hispid, twice the height of a man. It flowers from July to September.—Native of North America.

2. Silphium Terebinthinaceum; *Broad-leaved Silphium.* Leaves alternate, ovate, serrate, rugged; root-leaves cordate. Stem five feet high, strong, upright, annual, smooth. The smell of the flower, which is moderately large and yellow, is like that of the Sunflower. It flowers in August and September.—Native of North America.

3. Silphium Perfoliatum; *Square-stalked Silphium.* Leaves opposite, deltoid, petioled, perfoliate; stem four-cornered, even; root perennial. It flowers from July to October.—Native of North America.

4. Silphium Connatum; *Round-stalked Silphium.* Leaves opposite, sessile, perfoliate; stem round, rugged. Root perennial; stem the height of a man, as thick as the thumb, erect, quite simple, round at the bottom. It flowers from July to October.—Native of North America.

5. Silphium Asteriscus; *Hairy-stalked Silphium.* Leaves undivided, sessile, opposite, lower alternate; root perennial; stem four or five feet high. It flowers from July to September.—Native of Virginia and Carolina.

6. Silphium Trifoliatum; *Three-leaved Silphium.* Leaves in threes. Root perennial and woody; stems annual, rising five feet high, or more in good land, of a purplish colour, and branching towards the top. It flowers from July to October.—Native of many parts of North America.

7. Silphium Trilobatum; *Three-lobed Silphium.* Leaves opposite, sessile, wedge-form. This is a weakly plant, creeping far among other vegetables, but more luxuriant and upright towards the top.—Native of the West Indies.

8. Silphium Arborescens; *Tree Silphium.* Leaves lanceolate, alternate, rugged, slightly serrate; stem shrubby; flowers terminating, some singly on slender peduncles, others by two or three upon each peduncle, unequal in height.—Native of La Vera Cruz in New Spain. Slip off the young shoots in July; plant them in a pot filled with light loam; plunge it in a gentle hot-bed, covering the pot closely with a bell or hand glass, and shade it from the sun. When the slips are rooted, plant each in a separate pot; place them during the warm months in the open air, in a warm situation; but in winter keep them in a moderate stove.

9. Silphium Lævigatum; *Polished Silphium.* Stem simple, tetragonal, sulcate, glabrous; leaves opposite, sessile, ovate, acuminate, very finely serrate, subcordate at the base, glabrous on both sides; squames of the calix ovate, ciliate; flowers in a close corymb.—This plant grows to the height of two feet, and is a native of Georgia.

Silver Bush. See *Anthyllis.*

Silver Tree. See *Protea.*

Silver Weed. See *Potentilla.*

Simpler's Joy. See *Verbena.*

Sinapis; a genus of the class Tetradynamia, order Siliquosa.—Generic Character. *Calix:* perianth four-leaved, spreading; leaflets linear, concave, channelled, cruciform, spreading, deciduous. *Corolla:* four-petalled, cruciform; petals roundish, flat, spreading, entire; claws erect, linear, scarcely the length of the calix; nectareous glands four, ovate; one on each side between the shorter stamina and the pistil, and one on each side between the longer stamina and the calix. *Stamina:* filamenta six, awl-shaped, erect, two of them opposite, the length of the calix, and four longer; antheræ from erect spreading, acuminate. *Pistil:* germen cylindrical; style length of the germen and height of the stamina; stigma capitate, entire. *Pericarp:* silique oblong, torose below, rugged, two-celled, two-valved; partition for the most part twice the length of the valves, large, compressed. *Seeds:* many, globular. *Observe.* This species differs from Brassica in having the calix spreading, and the claws of the petals erect. Essential Character. *Calix:* spreading. *Corolla:* claws erect. *Gland:* between the shorter stamina and pistil, and between the longer stamina and calix.——The species are,

1. Sinapis Arvensis; *Wild Mustard,* or *Charlock.* Siliques multangular, torose, turgid, longer than the ancipital beak; leaves ovate, sublyrate. Root annual, fusiform, small, rigid; stem from nine inches or a foot, to a foot and half in height, either wholly green or tinged with red. It is confounded by husbandmen, under the name of *Charlock,* with *Raphanus Raphanistrum,* which is as common a weed in some fields as this is in others. Its common English name is Wild Mustard; but it is called Charlock, Garlock, Chadlock, and Kedlock, all of which are the same name, differently pronounced in different counties. In some parts of Yorkshire it is called *Runsh.* The seed is extremely pungent, and is sold under the name of Durham Mustard. The young plants, and particularly the tender tops, before they flower, are boiled and eaten as greens by husbandmen, in Scandinavia, Ireland, and many parts of England. This and the other species, when they are weeds among corn, being annuals, may be destroyed, or at least checked, by spring feeding with sheep, or by weeding with the hook, to prevent its flowering. The seed will lie in the ground till turned up within the

sphere of vegetation; by which means it may be destroyed on fallows.

2. Sinapis Orientalis; *Oriental Mustard.* Siliques hispid backwards, slightly four-cornered, and compressed at the tip. Annual.—Native of the Levant.

3. Sinapis Brassicata; *Cabbage Mustard.* Leaves obovate, toothletted, even; stem and pod like that of the cabbage.—Native of China and Cochin-china.

4. Sinapis Alba; *White Mustard.* Siliques hispid, torose, shorter than the ancipital beak; leaves pinnatifid, hispid. Root annual. Ray distinguishes this species from Common Mustard and Charlock, by the leaves being more deeply and frequently cut; the pods hairy, and standing out more from the stalk; the seeds very large, so as to swell out the pod into knots; and the pod itself finishing in a broad, thin, oblong, sword-shaped point. It is generally cultivated in gardens as a salad herb, for winter and spring use. The seeds have nearly the same properties with those of the next species.—Native of Germany, France, Flanders, Switzerland, and Britain, in corn-fields, on banks, and by road-sides, flowering in June, and ripening its seeds in August. Sow the seeds very thick in drills, upon a warm border, or, in very cold weather, upon a moderate hot-bed. They will be fit for use in ten days or a fortnight, for if they are large, and have rough leaves, they are too strong to put into salads. To save the seeds, a spot of ground must be sown in the spring; and when the plants have four leaves, hoe the ground in dry weather, in the same manner as for Turnips. Repeat this in a month's time, leaving the plants eight or nine inches asunder. If this be well performed, and in dry weather, the ground will remain clean till the seeds are ripe. As soon as the pods change brown, cut the plants off, and spread them upon cloths two or three days to dry, and thresh them out for use.

5. Sinapis Nigra; *Common* or *Black Mustard.* Siliques smooth, four-cornered, pressed to the raceme; upper leaves linear-lanceolate, quite entire, smooth. Root annual, small; stem upright, round, streaked, three or four feet high, with many distant spreading branches; flowers numerous, small, bright yellow; seeds several, round, smooth, brown. The hanging down of the upper leaves, distinguishes this at first sight from its congeners. The seeds reduced to powder make the common Mustard, so much requested at our tables. Taken inwardly, in the quantity of a large table-spoonful, they gently move the bowels, and are serviceable in asthmatic complaints, the rheumatism, and palsy. The powdered seeds curdle milk, and impregnate boiling water very strongly. This infusion, when taken in considerable quantity, causes vomiting, but in smaller doses it is a gentle aperient and diuretic. Poultices made with Mustard flower, crumbs of bread, and vinegar, are frequently applied to the soles of the feet in fevers, and may be used to advantage in fixed rheumatic and sciatic pains. In short, whenever a strong stimulating medicine is wanted to act upon the nervous system, without exciting much heat, there is none preferable to Mustard seed. A large spoonful of the unbruised seeds taken every morning, is excellent against rheumatic complaints, and the falling sickness. They operate by urine, and moderately promote the menstrual discharge; and while they are producing these good effects, they strengthen the stomach, disperse wind, and create an appetite. Eaten as a salad, it is an excellent antiscorbutic. The seeds distilled with water, yield an essential oil of great acrimony: when pressed, they afford a considerable quantity of mild insipid oil, which is as free from acrimony as that of Almonds. Bergius informs us, that he found Mustard of great use in curing vernal intermittents; for this purpose he directed a spoonful of the whole seeds to be taken three or four times a day, during the hot fit; and when the disease was obstinate, he added flour of Mustard to the bark. The seed may be given either entire or bruised, to the quantity of a spoonful or half an ounce to a dose.—Common on hedge banks, waste ground, and the borders of fields: flowers in the middle of summer. It is cultivated only for the seeds, and should be sown in the same way as those of the preceding species, and treated in the same manner, only allowing the plants twice as much room, or hoeing them out to the distance of eighteen inches. Sometimes this species requires to be hoed three times. The other species may be treated in the same way.

6. Sinapis Pyrenaica; *Pyrenean Mustard.* Siliques streaked, rugged; leaves runcinate, even.—Native of the Pyrenees, Mount Cenis, and various Alps.

7. Sinapis Pubescens; *Pubescent Mustard.* Siliques pubescent, erect; beak compressed; leaves lyrate, villose; stem perennial, shrubby.—Native of Sicily.

8. Sinapis Hispida; *Hispid Mustard.* Siliques hispid, erect; leaves lyrate, very rugged; stem hispid; root annual; flowers yellow.—Native of Morocco.

9. Sinapis Chinensis; *Chinese Mustard.* Siliques even, slightly jointed, patulous; leaves lyrate-runcinate, subhirsute. There are two varieties of this species in Cochin-china, with entire leaves, not lyrate, being more tender, and having more flavour. The seeds also are used in medicine.—Native of China and Cochin-china, and very extensively cultivated in both countries.

10. Sinapis Juncea; *Fine-leaved Mustard.* Branches in bundles; upper leaves lanceolate, quite entire. Annual. It has the same pungency and smell as the common Mustard.—Native of China.

11. Sinapis Allionii. Siliques ovate-oblong, patulous; leaves pinnatifid; segments gashed; root fibrous, white, annual. The whole plant nearly smooth.—Grows in Austria.

12. Sinapis Erucoides; *Dwarf Mustard.* Siliques smooth, equal; leaves lyrate, oblong, smooth. Root annual; stem eight or nine inches high, purplish, a little angular; leaves much jagged, yellowish-green; flowers white, in loose spikes.—Native of Italy and Spain.

13. Sinapis Cernua; *Pendulous Mustard.* Siliques even, patulous; root-leaf lyrate; end lobe very large, ovate, gash-toothed.—Native of Japan and China.

14. Sinapis Hispanica; *Spanish Mustard.* Leaves doubly pinnate; segments linear.—Native of Spain.

15. Sinapis Japonica; *Japanese Mustard.* Siliques even, erect; leaves gash-pinnatifid, smooth. It flowers in May.—Native of Japan, about Jedo.

16. Sinapis Incana; *Hoary Mustard.* Siliques pressed to the raceme, even; lower leaves lyrate, rugged; upper lanceolate. Root branched, hard, acrid, having the taste and smell of Navew. Stem rugged. It is biennial.—Native of France, Spain, Portugal, and Switzerland.

17. Sinapis Frutescens; *Shrubby Mustard.* Siliques linear, even; lower leaves oblong, toothed; upper lanceolate, entire; stem smooth, shrubby. It flowers from December to June.—Native of the Island of Madeira.

18. Sinapis Radicata. Root-leaves deeply lyrate, hispid; stem-leaves pinnate; branches rod-like, smooth; siliques awl-shaped, tomulose, spreading. Root perennial, very long, twisted, having filiform branches; stem hispid at the base, smooth above.—Found in the barren hills near Algiers.

19. Sinapis Lævigata; *Smooth Mustard.* Siliques even, patulous; leaves lyrate, smooth; upper lanceolate. Stem and leaves remarkably smooth; flowers large, yellow.—Native of Spain and Portugal, flowering in June and July.

Siphonanthus; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, wide, permanent. *Corolla:* one-petalled, funnel-form; tube filiform, very narrow, several times as long as the calix; border, four-parted, spreading, less than the calix. *Stamina:* filamenta four, longer than the border of the corolla; antheræ oblong, triangular. *Pistil:* germen four-cleft, very short, superior; style filiform, length of the stamina, recurved at the tip; stigma simple. *Pericarp:* berries four, within the spreading calix, roundish. *Seeds:* solitary, roundish. Essential Character. *Corolla:* one-petalled, funnel-form, very long, inferior. *Berries:* four, one-seeded.——The species are,

1. Siphonanthus Indica. Border of the corolla spreading; stigma undivided; stem herbaceous, quite simple; leaves opposite and alternate, linear-lanceolate; flowers in axillary corymbs, three or four together.—Native of South America.

2. Siphonanthus Angustifolia. Border of the corolla two-lipped; stigma bifid. The leaves are like those of the preceding species, but much narrower, and by threes; flowers axillary, in bifid corymbs, six-flowered or three-flowered.—Native of South America.

Siphonia; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male Flowers:* numerous, in racemes. *Calix:* perianth one-leafed, rather globular, bell-shaped, half five-cleft; teeth erect, acute, reflex at the edge. *Corolla:* none. *Stamina:* filamenta united into a column, shorter than the calix; antheræ five, growing to the column below the top of it, subovate. *Female:* terminating, one in each raceme. *Calix:* perianth one-leafed, turbinate, bell-shaped, five-cleft; teeth acute, from spreading recurved, deciduous, the circular base only remaining. *Corolla:* none. *Pistil:* germen conical, subglobular, shorter than the calix; style none; stigmas three, thickish, depressed, two-lobed. *Pericarp:* capsule large, tricoccous, depressed, hollow at the base, woody, very hard, covered with a fibrose bark, three-celled; cells two-valved; valves opening elastically. *Seeds:* solitary, or two or three, subovate, with a brittle spotted shell. Essential Character. *Calix:* one-leafed, bell-shaped, five-cleft. *Corolla:* none. *Male:* antheræ five, growing below the top of the column. *Female:* style none. *Stigmas:* three. *Capsule:* tricoccous. *Seed:* one, sometimes two or three. ——The only species yet discovered is,

1. Siphonia Elastica; *Elastic Gum Tree.* A tree fifty or sixty feet high, with a thin gray bark, and soft white wood. The trunk, when wounded, discharges a milky fluid, which being collected, either in a lump, or by smearing it over clay figures, dries, and becomes the Indian rubber, or gum-elastic, so well known for obliterating pencil marks.—Native of Brazil, and the forests of Guiana. See *Jatropha Elastica.*

Sison; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal, with fewer than six rays, unequal; partial with fewer than ten rays, unequal. Involucre universal, mostly four-leaved, unequal; partial similar to it; perianth scarcely manifest. *Corolla:* universal, uniform; florets all fertile; partial equal; petals five, lanceolate, inflected, flattish. *Stamina:* filamenta five, capillary, length of the corolla; antheræ simple. *Pistil:* germen subovate, inferior; styles two, reflected; stigmas obtuse. *Pericarp:* none; fruit ovate, striated, bipartite. *Seeds:* two, ovate, convex, and striated on one side, flat on the other. Essential Character. *Involucres:* mostly four-leaved. *Fruit:* ovate, striated.——The species are,

1 Sison Amomum; *Hedge Honewort,* or *Bastard Stone Parsley.* Leaves pinnate; umbels erect, mostly four-rayed. Root annual or biennial, spindle-shaped, with lateral branches; stem erect, two or three feet high, except in dry places, where it is shorter; seeds aromatic and pungent when ripe and dry, but in an early state, they, like the whole herb, have a peculiar nauseous smell.—Native of England, Germany, the south of France, Carniola, and Piedmont. With us it is not uncommon in moistish spots under hedges, in chalky or marly soils, flowering late in the summer. Sow the seeds in autumn, in a moist shady spot of ground, or permit them to scatter, and the plants will rise without care.

2. Sison Segetum; *Corn Honewort.* Leaves pinnate; leaflets roundish, numerous; umbels drooping, irregular. Root small but strong, annual in general, but often biennial; stems very much branched, round, striated, slender, and rush-like, leafy; fruit oblong-ovate, doubly ribbed, pungent and aromatic, as is the whole plant in some degree.—Native of Switzerland and England, in corn-fields, in a chalk and clay soil, but not occurring very frequently. It has been observed in Madingley road, near Cambridge; and about Haddenham, in the Isle of Ely; about Goldington and Clapham, in Bedfordshire; near Kelmarsh, in Northamptonshire; at South Leigh, in Oxfordshire; at Binham, in Norfolk; and at Walthamstow, in Essex. It flowers in July and August.

3. Sison Canadense; *Three-leaved Honewort.* Leaves ternate. Root perennial; stem round, upright, smooth, little branched, two feet high, or more. Kalm says, that this plant abounds in the woods throughout North America; that the French call it *Serfeuil Sauvage,* and make use of it in spring, in green soups, like Chervil; and that it is universally commended in North America, as a wholesome antiscorbutic plant.—Sow the seeds in the same way as directed for the first species, and the plants will only require to be thinned and kept free from weeds. They delight in a moist soil and a shady situation, where the root will continue several years.

4. Sison Ammi; *Fennel-leaved Honewort,* Leaves tripinnate; root-leaves linear; stem-leaves bristle-shaped; stipular-leaves longer. Root annual; stem a foot high, simple, erect, very slightly grooved: branches very few at the top of the stem. This plant has a fragrant aromatic smell.—Native of Portugal, Apulia, and Egypt. Propagated like the preceding.

5. Sison Inundatum; *Water Honewort.* Leaves pinnate, gashed, those under water cut as fine as hairs into many parts; umbels five-flowered, bifid. Root annual or biennial; stems creeping, annual, round. It flowers in May, and with us is not uncommon in wet places overflowed in winter, as well as ditches and pools.—Native of the north of Europe, Germany, Britain, and Switzerland.

6. Sison Salsum. Root-leaves compound; leaflets subverticillate, bundled, lanceolate; stem leafless; branches umbelliferous, dichotomous. The leaves flourish in the spring, and after they wither away the stem grows up, and flowers in August.—Native of Siberia, in the salt plains near the Wolga.

7. Sison Crinitum. Root-leaves triplicate-pinnate; stem-leaves bipinnate; leaflets bristle-shaped; universal involucre many-leaved, bipinnate.—Native of Siberia.

8. Sison Pusillum. Leaves biternately multipartite; little umbels with from three to five flowers; seeds slightly scabrous.—Grows on the dry sandy fields of Carolina.

9. Sison Trifoliatum. All the leaves trifoliate; leaflets dentated; lower leaves oval, two and three lobed; upper leaves oval-lanceolate; umbel terminal, solitary, peduncled; seeds subrotund.—Grows in North Carolina.

10. Sison Marginatum. Leaves pinnate; upper leaves quinate; all the leaflets sessile, lanceolate, very entire, albid-marginate; involucre and involucels none.—Found in wet meadows, from Virginia to Carolina.

Sisymbrium; a genus of the class Tetradynamia, order Siliquosa.—Generic Character. *Calix:* perianth four-leaved; leaflets lanceolate-linear, spreading, coloured, deciduous. *Corolla:* four-petalled, cruciform; petals oblong, spreading, commonly less than the calix, with very small claws. *Stamina:* filamenta six, longer than the calix; of these two the opposite a little shorter; antheræ simple. *Pistil:* germen oblong, filiform; style scarcely any; stigma obtuse. *Pericarp:* silique long; incurved, gibbous, round, two-celled, two-valved; valves in opening straightish; partition a little longer than the valves. *Seeds:* very many, small. Essential Character. *Silique:* opening with straightish valves. *Calix* and *Corolla*, spreading.——The species are,

* *Siliques declined, short.*

1. Sisymbrium Nasturtium; *Common Water Cress.* Siliques declined; leaves pinnate; leaflets cordate, roundish. Roots perennial, consisting of long, white fibres, the lowermost fixed in the soil, the rest suspended in the water; stem spreading, declining or floating, angular, branched, leafy. The leaves, when it grows in the shade, are green; when exposed to the sun, purplish brown; when growing in a rapid current, they are sometimes considerably lengthened out, as is the case with other plants in the same circumstances; and in this state the leaves may be mistaken for those of *Sium Nodiflorum*, or Creeping Water Parsnep, which generally grows with it; but the leaves of the Water Parsnep are not only long and pointed, but serrate, of a much paler colour, and without any of that Cress-like taste which is to be found in Water Cresses. This plant is reputed to be an excellent antiscorbutic, with less acrimony than Scurvy Grass: it is supposed to purify the blood, and to open visceral obstructions. In the spring it is very frequently eaten as a salad. The juice is prescribed, with that of Scurvy Grass and Seville Oranges; and thus form a popular remedy for scurvy, under the title of *Spring Juices.*—This plant is found throughout Europe, from Sweden to Greece, and in North America: it is generally gathered for a spring salad out of ditches, and standing or slowly flowing waters, and it is also cultivated to supply the London markets. This may be easily done by taking some of the plants from the place of their natural growth early in the spring, being careful to preserve their roots as entire as possible, and plant them in mud, letting in water upon them by degrees. They will soon flourish, and spread over a large compass, yet should not be cut in the first season, but suffered to run to seed, for the seeds will fall into the water, and furnish a sufficient supply of plants. Where the water is so deep that it is not easy to plant it, procure a quantity of plants in July, just as the seeds are ripening, and throw them on the surface of the water: the seeds will ripen, fall to the bottom, and take root there, without any further care.

2. Sisymbrium Sylvestre; *Creeping Water Rocket.* Siliques declined; leaves pinnate; leaflets lanceolate, gash-serrate. Root perennial, whitish, slender, remarkably creeping, thickly beset with germina, which give it a knobbed appearance; stems numerous, a foot high, upright, or nearly so, leafy, flexuose, weak; sometimes purplish, smooth, somewhat angular, and finely grooved, branched; flowers yellow.—Native of Sweden, Britain, Germany, France, Switzerland, Carniola, Piedmont, and Siberia. In England it abounds upon the watery part of Tothill-fields, Westminster, and at several places on the banks of the Thames; on Cambridge common; between Chesterton Sluice and Barnwell Pool, and in the isle of Ely; on Bungay Common, in Suffolk; frequent in Bedfordshire; on the banks of the canal beyond Highbridge, Port Meadow, Binsey Common, and Atmore, in Oxfordshire; on the banks of the Severn, near Worcester; and on the banks of the Aire below Leeds.—This, and the two following species, may be propagated in the same manner as the preceding.

3. Sisymbrium Terrestre; *Annual Water Rocket.* Siliques declined, turgid; leaves pinnatifid, unequally toothed; root simple; petals shorter than the calix. Stem generally upright, branched, a foot high, and smooth. When this plant happens to be overflowed, which is often the case, it becomes more procumbent, and will sometimes take root at the joints. It has a less pungent taste than the other Cresses.—It is common about London, on the edges of wet ditches, and on ground liable to be overflowed; also at Hauxton, and near Ely Bridge, in Cambridgeshire; at Elstow and Goldington, in Bedfordshire; and on Bungay Common, in Suffolk. It flowers from June to September.

4. Sisymbrium Amphibium; *Great Water Rocket.* Siliques declined, pedicelled; leaves oblong, pinnatifid, or serrate; petals longer than the calix. Root perennial, fibrous; stems elongated, rooted, somewhat flexuose, leafy, grooved, little branched.—This species is found in rivers and brooks, and sometimes on the banks that are overflowed, in most parts of Europe, flowering from June to August. In running streams it grows to a great size, with long floating stems.

5. Sisymbrium Pyrenaicum; *Pyrenean Wild Rocket.* Siliques subovate; lower leaves lyrate; upper bipinnatifid, embracing; styles filiform; root perennial. It flowers in May and June.—Native of the Pyrenees, Arragon, Dauphiny, and Switzerland. This, with all those species which grow upon dry land, may easily be propagated by sowing the seeds in autumn, or by permitting them to scatter; thinning them and keeping them clean from weeds. Most of them prefer a dry soil, and some flourish best on walls.

6. Sisymbrium Tanacetifolium; *Tansey-leaved Wild Rocket.* Leaves pinnate; leaflets lanceolate, gash-serrate, the outmost confluent. Stalks a foot and half high. If this plant were not destitute of the peculiar smell of Tansey, the leaves are so like it, that it would be difficult to distinguish them.—Native of Italy, Dauphiny, and Switzerland.

7. Sisymbrium Ceratophyllum; *Horn-leaved Wild Rocket.* Siliques elliptic; leaves linear-subulate, pinnatifid-toothed, pubescent. Stem ascending; root annual; corolla yellow.—Found in the sands near Cassa in Barbary.

8. Sisymbrium Coronopifolium; *Buckthorn-leaved Wild Rocket.* Siliques linear, incurved; leaves lanceolate, pinnatifid, toothed, pubescent; stem ascending. It flowers in winter.—Native of the sands near Cassa in Barbary.

9. Sisymbrium Tenuifolium; *Fine-leaved Wild Rocket.* Siliques erect; leaves smooth, almost quite entire, pinnatifid or bipinnatifid; upper ones entire. Root perennial, fusiform, whitish, somewhat woody; stem very much branched, a foot and half high; flowers large, lemon or straw coloured, handsome, but smelling unpleasantly.—It flowers from July to October, and is a native of Germany, France, Piedmont, Switzerland, and England; where it is found on many old walls and castles, as about the Tower of London, London bridge, Hyde Park; also near Windsor, Chester, Bristol, Yarmouth, Lichfield, Taunton, Exeter, Berwick, Sunderland, &c.

10. Sisymbrium Sagittatum; *Arrow-leaved Wild Rocket.* Pubescent: siliques cylindrical, declined; leaves obovate-oblong, toothed; root-leaves hastate; stem-leaves sagittate, embracing. It flowers in May and June.—Native of Siberia.

11. Sisymbrium Amplexicaule; *Clasping-leaved Wild Rocket.* Smooth: siliques compressed, erect; leaves toothed; root-leaves obovate; stem-leaves oblong, cordate, embracing. Root annual; stems even, erect, having a few short hairs at the base, smooth above, branched, slightly streaked.—Native of the hills about Algiers.

** *Siliques sessile, axillary.*

12. Sisymbrium Supinum; *Decumbent Wild Rocket.* Siliques axillary, subsessile, solitary; leaves tooth-sinuate. Annual, flowering in June and July.—Native of the south of Europe.

13. Sisymbrium Polyceratium; *Dandelion-leaved Wild Rocket.* Siliques axillary, sessile, awl-shaped, aggregate; leaves repand, toothed; flowers in axillary clusters, small and yellow.—Native of the south of France, and of Italy.

14. Sisymbrium Filifolium; *Three-leaved Wild Rocket.* Siliques axillary, subsessile, compressed; leaves linear. Annual.—Native of Siberia, by the river Kuma.

15. Sisymbrium Bursifolium; *Shepherd's Purse-leaved Wild Rocket.* Raceme flexuose; leaves lyrate; stem erect, leafy.—Native of Italy, in moist mountainous parts.

16. Sisymbrium Torulosum; *Swoln-podded Wild Rocket.* Raceme erect; siliques sessile, pubescent; leaves lanceolate, toothed; stem branched, rough with short spreading hairs. Annual. It flowers early in spring.—Native of Tunis.

*** *Stem naked.*

17. Sisymbrium Murale; *Wall Wild Rocket.* Almost stemless: leaves lanceolate, sinuate, serrate, smoothish; scapes somewhat rugged, ascending. Root annual.—Native of France, Italy, and the isle of Thanet, in waste sandy ground.

18. Sisymbrium Monense; *Dwarf Sea Rocket.* Siliques almost upright; leaves pinnatifid, somewhat hairy; stems quite entire, simple, almost naked, smooth. Root perennial and strong.—Found in the Isle of Man; in Sella-fields Sea-bank, Cumberland; also between Marsh Grainge and the Isle of Walney; and in various parts of Scotland.

19. Sisymbrium Repandum; *Sinuate-leaved Wild Rocket.* Stem simple, naked; leaves oblong, repand-sinuate, smooth; scapes smooth; siliques compressed, four-cornered. Perennial.—Native of Provence, Dauphiny, and Piedmont.

20. Sisymbrium Tillieri. Stem almost naked, panicled; leaves smooth; root-leaves runcinate, sublyrate; stem-leaves pinnatifid at the base; flowers yellow.—Native of the Val d'Aost.

21. Sisymbrium Vimineum. Stems widely spreading, leafy at the base; leaves lyrate, even; scapes ascending; flowers minute.—Native of the south of France and Italy.

22. Sisymbrium Barrelieri; *Small Wild Rocket.* Stem almost naked, branched; root-leaves runcinate, toothed, hispid. Root annual. It is allied to the next species, but differs in having yellow flowers.—Native of Spain and Italy.

23. Sisymbrium Arenosum; *Sandy Wild Rocket.* Stem somewhat leafy, branched; leaves lyrate, rectangular, toothed, hispid, with branched hairs; corollas white tinged with pale violet, or quite white, or all purple. Annual.—Native of Sweden, Germany, Switzerland, Austria, and Carniola.

24. Sisymbrium Valantinum; *Valentia Wild Rocket.* Stem simple, erect, smooth above; leaves lanceolate, hispid, toothed in front. Root annual.—Native of Spain, in the kingdom of Valencia, and about Madrid.

**** *Leaves pinnate.*

25. Sisymbrium Parra; *Brazil Wild Rocket.* Caulescent: leaves runcinate, muricate; root annual or biennial; silique round, cylindrical, even, swelling a little at the seeds. Stemless in the first year.—Native of Brazil.

26. Sisymbrium Asperum; *Rough-podded Wild Rocket.* Siliques rugged; leaves pinnatifid; pinnas linear-lanceolate, somewhat toothed; corollas longer than the calix. Annual, flowering in May and June.—Native of the south of France, and in the marshes about Estremadura, in Spain.

27. Sisymbrium Lævigatum; *Smooth-podded Wild Rocket.* Siliques smooth; leaves pinnate; pinnules of the lower toothed, of the upper linear, and quite entire. Root annual; flowers yellow; siliques an inch and half long, smooth.—Native place uncertain.

28. Sisymbrium Millefolium; *Milfoil-leaved Wild Rocket.* Leaves superdecompound, tomentose; petals larger than the calix. It flowers from May to September.—Native of the rocks of Teneriffe. It resembles the following species.

29. Sisymbrium Sophia; *Flixweed.* Leaves pinnate, decompounded, somewhat hairy; petals smaller than the calix. Root annual, small, tapering; stem a foot and half to two feet high, upright, round, much branched, and very leafy; flowers inconspicuous, pale yellow. This plant received its English name from the quality attributed to it of curing immoderate purgings. It is useful in hysteric complaints; and the seeds are given to destroy worms. The juice of the leaves, or a decoction of the seeds, are excellent astringent medicines, and may be given to advantage in the bloody flux, spitting of blood, immoderate menstrual discharges, and all other hæmorrhages. The pods retain the seeds all the winter, and are then the food of small birds. Cattle seldom touch this plant. The force of gunpowder is said to be augmented by mixing a tenth part of the seeds with the other ingredients.—It occurs in most parts of Europe, upon walls, among rubbish, about church-yards, waste grounds, hedges, and dunghills, flowering in summer, and ripening its seeds in September.

30. Sisymbrium Album; *White Wild Rocket.* Leaves whitish, pubescent, pinnate; leaflets obtuse, attenuated at the base. Root perennial; stems a span high, upright, very finely tomentose.—Native of Siberia.

31. Sisymbrium Cinereum; *Ash-coloured Wild Rocket.* Leaves pubescent, somewhat fleshy, pinnate; pinnas linear, filiform; flower violet-coloured. Annual.—Native of Barbary.

32. Sisymbrium Altissimum; *Tall Wild Rocket.* Leaves runcinate, flaccid; leaflets sublinear, quite entire; peduncles loose; flowers scattered at the ends of the branches. It flowers in August.—Native of Siberia, Armenia, and Austria.

33. Sisymbrium Echartsbergense; *Austrian Wild Rocket.* Leaves runcinate, flaccid, rugged at the edge, and quite entire; siliques filiform, inflex, patulous. Annual.—Supposed to be a native of Thuringia.

34. Sisymbrium Pannonicum; *Hungarian Wild Rocket.* Lower leaves runcinate, toothed; upper pinnate; pinnas linear, quite entire; siliques spreading rectangularly; calix and corolla yellow. It is an annual plant, flowering in August.—Native of Hungary.

35. Sisymbrium Erysimoides. Leaves runcinate, lyrate, toothed, smooth; siliques spreading rectangularly, subpeduncled. Flowers small, white; racemes long.—Native of Tunis near Kerwan, in sandy places.

36. Sisymbrium Frio; *London Wild Rocket*, or *Broad-leaved Hedge Mustard.* Leaves runcinate, toothed, naked; stem smooth; siliques erect, very long. Root annual, fusiform, small. Stem upright, from one to two feet high, round, shining, here and there purplish, somewhat flexuose. The whole plant is perfectly smooth, with the biting taste of mustard; seeds very small, pale yellow, and being a little protuberant, the pods have the appearance of being finely jointed, a character which readily distinguishes this plant. After the great fire of London in 1666, this plant came up in such abundance on the ruins, that in many places it might have been mowed like a field of corn. It is still frequent in the neighbourhood of the metropolis.—Native of many parts of Europe, in corn-fields; with us on dry banks, old walls, and among rubbish; flowering from June to July or August.

37. Sisymbrium Columnæ; *Columna's Wild Rocket.* Leaves runcinate, toothed, with the stem villose and somewhat hoary;

siliques erect. Annual.—Native of Germany, Austria, and Italy, in dry places.

38. Sisymbrium Loeselii; *Lœsel's Wild Rocket.* Leaves runcinate, acute, rough-haired; stem hispid backwards. Root annual.—Native of Germany, Italy, and Greece.

39. Sisymbrium Obtusangulum; *Blunt-lobed Wild Rocket.* Leaves pinnatifid, obtuse, toothed, embracing; stem hispid backwards; root annual.—Native of Switzerland.

40. Sisymbrium Orientale; *Oriental Wild Rocket.* Leaves runcinate, tomentose; stem even. It flowers in July. Annual.—Native of the Levant.

41. Sisymbrium Barbareæ. Leaves simple, spatulate-ovate, embracing, naked. Stem angular; root perennial.—Native of the Levant.

42. Sisymbrium Lyratum; *Lyrate-leaved Wild Rocket.* Lower leaves lyrate, runcinate, toothed; upper linear-lanceolate, remotely toothed. Perennial.—Native of the Cape.

43. Sisymbrium Catholicum; *Portuguese Wild Rocket.* Leaves pinnate, toothletted; siliques erect, on long spreading stalks.—Native of Spain and Portugal.

44. Sisymbrium Heterophyllum; *Various-leaved Wild Rocket.* Leaves pinnate; leaflets kidney-form, subtrilobate, lowest pinnatifid, hairy.—Native of New Zealand.

45. Sisymbrium Glaciale; *Icy Wild Rocket.* Siliques filiform, even; leaves pinnate; leaflets kidney-form, ciliate. Root perennial; flowers white, biggish in proportion to so small a plant. It is allied to the preceding species.—Native of Terra del Fuego, in the mountains, almost under the perpetual snows.

***** *Leaves lanceolate, entire.*

46. Sisymbrium Strictissimum; *Spear-leaved Wild Rocket.* Leaves oblong-lanceolate, toothed, pubescent, petioled; siliques ascending. Flowers in loose terminating spikes, small, yellow, and appearing in June; root perennial. The pods ripen in August.—Native of Germany, Austria, Switzerland, and Italy.

47. Sisymbrium Pendulum; *Pendulous Wild Rocket.* Leaves lanceolate, gash-toothed, hispid; siliques pendulous.—Native of Barbary.

48. Sisymbrium Hispanicum; *Spanish Wild Rocket.* Leaves lanceolate, toothed, sessile, smooth; siliques pressed close; stem branched, divaricating. Flowers yellow; root biennial; racemes long.—Native of Spain.

49. Sisymbrium Pusillum; *Dwarf Wild Rocket.* Leaves lanceolate, toothed, sagittate, embracing, pubescent; siliques from erect spreading. Root annual; flowers yellow.—Native of the northern parts of Persia.

50. Sisymbrium Salsuginosum; *Salt Wild Rocket.* Leaves lanceolate, quite entire, cordate, embracing, smooth; siliques spreading.—Native of Siberia.

51. Sisymbrium Integrifolium; *Entire-leaved Wild Rocket.* Leaves linear, quite entire; peduncles glutinous-hispid. Annual.—Native of Siberia.

52. Sisymbrium Indicum; *Indian Wild Rocket.* Leaves lanceolate-ovate, serrate, petioled, even; siliques slightly bowed. Root annual; flowers small, white, with the petals scarcely longer than the calix.—Native of the East Indies.

53. Sisymbrium Hispidum; *Hairy Wild Rocket.* Caulescent; leaves petioled, oblong, toothed, hispid; stem also hispid.—Native of Egypt.

Sisyrinchium; a genus of the class Monadelphia, order Triandria.—Generic Character. *Spathe:* common ancipital, two-leaved; valves compressed, acuminate; partial several, lanceolate, concave, obtuse, one-flowered. *Corolla:* one-petalled, superior, six-parted; segments obovate, with a point, from erect spreading; three outer alternate, a little wider. *Stamina:* filamenta three, united into a subtriquetrous tube, shorter than the corolla, distinct at the top; antheræ bifid below, fastened by the back. *Pistil:* germen obovate, inferior; style three-sided, length of the tube; stigmas three, thickish, awl-shaped at the top, erect. *Pericarp:* capsule obovate, rounded, three-sided, three-celled, three-valved, with the partitions contrary. *Seeds:* several, globular. Essential Character. *Spathe:* two-leaved. *Calix:* none. *Petals:* six, almost equal. *Style:* one. *Capsule:* three-celled, inferior.——The species are,

1. Sisyrinchium Elegans. Scape round, one-flowered, simple; leaf radical, linear, acuminate, shorter; petals oblong, acute; corolla yellow on the outside.—Native of the Cape. See the next species.

2. Sisyrinchium Collinum. Scape round, one-flowered, simple; leaf linear-acuminate, shorter; petals oblong, acute. This is very like the preceding species.—Native of the Cape, where it is very abundant. This, and the preceding, must be kept in the dry-stove, and the other species in the bark-bed. They may all be increased by the root.

3. Sisyrinchium Grandiflorum; *Great-flowered Sisyrinchum.* Scape round, simple, leafy; spathe subtriflorous; petals obovate, obtuse; leaves lanceolate, plaited. Root bulbous.—Native of Peru.

4. Sisyrinchium Bermudiana; *Iris-leaved Sisyrinchium.* Scape ancipital, branched, leafy; spathe subquadriflorous, shorter than the flowers; petals mucronate; leaves ensiform; root fibrous, perennial. The stalk is terminated by a cluster of six or seven flowers, on short peduncles, and enclosed in a two-leaved keel-shaped sheath before they open; they are of a deep blue colour, with yellow bottoms, and are an inch over when fully expanded.—Native of Bermuda. This is a tender plant, and requires the protection of a glass-case. Both it and the next species are propagated by seeds, and also by parting their roots; if they are raised from seeds, they should be sown in autumn soon after they are ripe, upon an eastern aspected border, where they may have only the morning sun: the best way will be to sow them in drills, at three or four inches' distance, covering them about half an inch with light earth. In the spring the plants will appear, when their leaves have greatly the resemblance of grass, and therefore care should be taken that they are not pulled up as weeds by those who till the ground. During the first summer, they will require no other care but to keep them clean from weeds, unless the plants should come up so close as not to have room to grow; in which case part of them should be drawn out to give room to others, and these may be planted in a shady border at three inches' distance, where they may remain till autumn; when they should be transplanted to the places where they are to remain, and in the following summer they will flower. These plants prefer a shady situation, and a soft loamy undunged soil. The time for transplanting and slipping off the old roots is early in autumn, that they may get good roots before winter.

5. Sisyrinchium Anceps; *Narrow-leaved Sisyrinchum.* Scape ancipital, winged, simple, almost leafless; spathe subquadriflorous, unequal, longer than the flowers; petals mucronate; leaves ensiform. Root perennial, fibrous, from which arise many very narrow spear-shaped leaves. The flowers of this only expand for a short time in the morning, but the others continue open the whole day.—Native of Virginia, and other parts of North America. See the preceding.

6. Sisyrinchium Micranthum; *Small-flowered Sisyrinchium.* Scape ancipital, branched, leafy; spathe subtriflorous, unequal, nearly equal to the flowers; petals linear, acuminate; leaves grassy, channelled.—Native of Peru.

7. Sisyrinchium Palmifolium; *Palm-leaved Sisyrinchium.* Scape ancipital; flowers panicled; leaves ensiform, nerved, and plaited.—Native of Brazil.

8. Sisyrinchium Striatum. Scape ancipital, leafy; flowers in spikes, ancipital; petals roundish, ovate, acute; leaves linear, ensiform. Root tuberous; stems two feet high, erect, smooth, much branched, many-flowered. It thrives and flowers abundantly in the open ground.—Native of Mexico.

9. Sisyrinchium Ixoides. Scape compressed, panicled at top; outer petals half the size of the inner; leaves ensiform, nerved; root fibrous; flowers on the branchlets, terminating. —Native of New Zealand.

10. Sisyrinchium Narcissoides. Stem erect, round; spathe two-valved, subquadriflorous; flowers drooping; leaves linear, ensiform; corolla white. There is a fine variety with the flowers streaked longitudinally within, and without with deep purple.—Native of the straits of Magellan.

11. Sisyrinchium Mucronatum. Leaves and scapes simple, subsetaceous; spathe coloured; flowers beautiful blue, smaller than those of the fourth species.—Grows in the wet meadows of short grass in Pennsylvania and Virginia.

Sium; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal various in different species; partial spreading, flat: involucre universal many-leaved, reflex, shorter than the umbel, with lanceolate leaflets; partial many-leaved, linear, small: perianth proper scarcely observable. *Corolla:* universal uniform; floscules all fertile; partial of five equal heart-shaped petals. *Stamina:* filamenta five, simple; antheræ simple. *Pistil:* germen very small, inferior; styles two, reflex; stigmas obtuse. *Pericarp:* none: fruit subovate, striated, small, bipartite. *Seeds:* two, subovate, convex and striated on one side, flat on the other. Essential Character. *Involucre:* many-leaved. *Petals:* cordate, equal. *Fruit:* subovate, striated. ——The species are,

1. Sium Filifolium; *Thread-leaved Water Parsnep.* Leaves filiform; involucres elongated. Stem herbaceous, erect, a foot high, scarcely branched, slender, round, smooth, slightly streaked.—Native of the Cape.

2. Sium Latifolium; *Broad-leaved Water Parsnep.* Leaves pinnate; leaflets oblong-lanceolate, equally serrate. Root perennial, creeping among mud and gravel, throwing up round, hollow, upright, smooth, deeply furrowed stems, four, five, and sometimes even six feet high; umbels large, flattish, white. This plant is of an acrid poisonous quality, particularly the roots. It flowers in July and August.—Native of many parts of Europe, and of Siberia: it is often met with in rivers and fens throughout England, as between Rotherhithe and Deptford; at Northfleet in Kent; in the Isle of Ely; not uncommon in Norfolk; in Bedfordshire and Oxfordshire; in various parts of Dorsetshire, &c. This and the four following species being marsh or water plants, if cultivated in gardens, must be placed in tubs filled with water, having earth in the bottoms; or near canals and ponds.

3. Sium Angustifolium; *Narrow-leaved Water Parsnep.* Leaves pinnate; leaflets unequally lobed, and serrate; umbels peduncled, opposite to the leaves; stem erect. Root perennial, creeping, so as to occupy much space. Doody considered this species as a specific in the scrofula; and Dr. Withering observes, that it ought to be examined on account of its active qualities.—Native of most parts of Europe. Found in England, in ditches and rivulets: flowering in July and August. See the second species.

4. Sium Nodiflorum; *Procumbent Water Parsnep.* Leaves pinnate; leaflets ovate, equally serrate; umbels sessile, opposite to the leaves; stem procumbent. Root perennial, creeping. This plant is not now admitted into any Pharmacopœia: it was formerly received in the character of an antiscorbutic, or rather as a corrector of acrid humours, especially when manifested by cutaneous eruptions and tumours in the lymphatic system. The best proofs of its efficacy are from Dr. Withering: a child six years old was cured of an obstinate cutaneous disease, by taking three large spoonfuls of the juice twice a day; and the doctor adds, "I have repeatedly given to adults three or four ounces every morning, in similar complaints, with the greatest advantage. It is not nauseous, and children take it readily if mixed with milk. In the dose I have given, it neither affects the head, the stomach, nor the bowels."—Native of many parts of Europe. It flowers in July and August; found in the ditches and rivulets common in Britain. See the second species.

5. Sium Repens; *Creeping Water Parsnep.* Leaves pinnate; leaflets roundish, tooth-gashed; umbels peduncled, opposite to the leaves; stem creeping.—Native of Bohemia, in wet meadows; and of Austria, on the banks of the Danube. In England it has been found in Cambridgeshire, on Coldham Common near Cambridge; on Bullington Green and Cowley Bottom, near Oxford; on Goldington Green and Stevington Bogs, in Bedfordshire; in wet places in the south of Scotland; at Fiskerrow, five miles from Edinburgh; and in abundance on the moist parts of Guillon Links, East Lothian. It flowers from June to August.

6. Sium Verticillatum; *Whorled Water Parsnep.* Leaves multifid, capillary, in whorls. Root perennial, consisting of several oblong tubers, tapering to a point; stem from twelve to eighteen inches high, erect, round, striated, smooth, little branched, and almost naked.—Native of Germany, France, the Pyrenees, and Great Britain, in moist meadows; and plentiful in the western parts of Scotland and Wales.

7. Sium Sisarum; *Skirret.* Leaves pinnate; floral leaves ternate. Root composed of several fleshy tubers, as large as a man's little finger, and joining together in one head; the herb twelve or eighteen inches high, erect, branched, leafy; leaves serrated; umbels terminal, white, rather small.—Native of China; but long cultivated in Europe, for the sake of the roots, which were supposed to possess an exciting quality; they were formerly used more than at present, being esteemed wholesome and nutritive, but flatulent. Their sweet taste is disagreeable to many palates. They were eaten boiled and stewed in butter, pepper, and salt, or rolled in flour and fried, or else eaten cold with oil and vinegar, after having been boiled.—This plant is cultivated two ways, first by seeds, and afterwards by slips from the roots. The former is the best method, because the roots which are raised from seeds generally grow larger than those raised from slips, and are less subject to be sticky. The seeds should be sown at the latter end of March or the beginning of April, either in broad-cast or in drills: the ground should be light and moist, for in dry land the roots are generally small, unless the season proves very moist. If the seeds are good, the plants will appear in five or six weeks after they are sown, and when they have put out their leaves so as to be readily distinguished from the weeds, the ground should be hoed over to destroy the weeds, in the same manner as is practised for Carrots; and where the seeds are sown in broad-cast, the plants should be cut up, leaving them at the same distance as Carrots. Those sown in drills, should be also thinned to the distance of four inches, and the ground hoed over to destroy the weeds; this should be repeated three times, as is usually done for Carrots, and which, if well performed in dry weather, will keep the ground sufficiently clean, unless much rain should fall about Midsummer, for the leaves will spread and

cover the ground. In autumn, when the leaves begin to decay, the roots will be fit for use, and will continue so till the spring; after which time they will become sticky, as do those which run up to seed the first summer. To propagate this plant by offsets, dig up the old roots in the spring, before they begin to shoot, and slip off the side-shoots, preserving an eye or bud to each; plant them in rows one foot asunder, and four inches distant in the rows.

8. Sium Rigidius; *Virginian Water Parsnep.* Leaves pinnate; leaflets lanceolate, almost quite entire; stem stiffish; flowers small; petioles channelled. It flowers in July and August.—Native of Virginia.

9. Sium Japonicum; *Japanese Water Parsnep.* Leaves pinnate; leaflets gashed; umbels terminating; stem erect, flexuose, branched at top.—Native of Japan, in the island of Niphon, flowering in June.

10. Sium Falcaria; *Decurrent Water Parsnep.* Leaflets linear, decurrent, connate. Roots creeping, and spreading very far under ground, thick, fleshy, and tasting like those of Eryngo. The least part of the roots will grow, so that it very soon multiplies itself. It flowers in July and August.——Native of Asia and Africa, as well as of Europe.

11. Sium Grandiflorum; *Great-flowered Water Parsnep.* Leaves bipinnate; leaflets roundish, gash-toothed.—Native of the Cape.

12. Sium Paniculatum; *Panicled Water Parsnep.* Leaves bipinnate; leaflets linear, pinnatifid.—Native of the Cape.

13. Sium Patulum; *Spreading Water Parsnep.* Leaves bipinnate; leaflets trifid; branches diffuse.—Native of the Cape.

14. Sium Græcum; *Grecian Water Parsnep.* Leaves bipinnate; leaflets lanceolate, serrate, the uppermost confluent; flowers yellow.—Native of Greece.

15. Sium Decumbens; *Prostrate Water Parsnep.* Leaves bipinnate; leaflets trifid; stem decumbent.—Native of Japan, on the island of Niphon, where it is called *Jingosaku.*

16. Sium Siculum; *Sicilian Water Parsnep.* Radical leaves ternate; stem-leaves bipinnate; stem two feet high, terminated in July by an umbel of yellow flowers.—Native of Sicily, and the hills near Algiers.

17. Sium Asperum; *Rough Water Parsnep.* Leaves tripinnate; peduncles and pedicels rugged.—Native of the Cape.

18. Sium Hispidum; *Shaggy Water Parsnep.* Leaves tripinnate; petioles and peduncles rugged.—Native of the Cape.

19. Sium Villosum; *Villose-leaved Water Parsnep.* Leaves tripinnatifid; segments ovate, gash-serrate, villose.—Native of the Cape.

20. Sium Lineare. Leaves pinnate; little leaves long, sublanceolate-linear, somewhat remotely serrate; involucre of few leaves; involucels linear, polyphyllous; umbel short, radiate.—Grows in wet meadows, and along ditches, from Canada to Pennsylvania.

21. Sium Longifolium. Leaves pinnate; leaflets very long, falcate, linear, dentated; stem slightly leafy, naked on the upper part; umbels somewhat naked.—Grows in the ditches and bogs of New Jersey.

Skimmia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, very small, permanent, almost four-parted to the base; segments ovate, acute. *Corolla:* petals four, ovate, concave, minute. *Stamina:* filamenta four, very short; antheræ? *Pistil:* germen superior, roundish; style single; stigma? *Pericarp:* berry ovate, umbilicate, indistinctly grooved, smooth, farinaceous, pulpy within, four-valved. *Seeds:* four, subtrigonal, or externally convex, oblong, white. *Observe.* The perianth is occasionally five-parted. Essential Character. *Calix:* four-parted. *Petals:* four, concave. *Berry:* four-seeded.——The only species is,

1. Skimmia Japonica. Stem shrubby, erect, smooth; leaves at the ends of the branches alternate, frequent, oblong, waved, entire; flowers terminating in panicles. The foliage is evergreen, and has an aromatic flavour. The fruit ripens in December.—Native of various parts of Japan.

Slipper, Lady's. See *Cypripedium.*

Sloanea; (so called in honour of the celebrated Physician Sir Hans Sloane:) a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, in five or more parts; segments ovate, a little unequal. *Corolla:* none. *Stamina:* filamenta very numerous, very short, inserted into a villose receptacle; antheræ oblong, growing to the side of the filamenta. *Pistil:* germen oblong, angular; style simple, awl-shaped; stigma five-cleft, acute. *Pericarp:* capsule large, roundish, echinate with deciduous prickles, with from three to six valves, and as many cells; partitions opposite to the valves. *Seeds:* solitary, or in pairs, oblong, involved in a berried aril. Essential Character. *Calix:* one-leafed, from five to nine cleft. *Corolla:* none. *Antheræ:* growing to the filamenta below the top. *Capsule:* echinate, from three to six celled, with as many valves. *Seeds:* two, in a berried aril.——The species are,

1. Sloanea Dentata. Leaves ovate; stipules cordate, triangular, serrate; calix deeply divided. This is a lofty tree, with round leafy branches, covered with down when young.—Native of South America and the West Indies.

2. Sloanea Grandiflora. Leaves toothed, tapering at the base; stipules triangular, cordate; calix with shallow segments. Flowers very large, indented at the edge, oval, and ending in a point. The trunk of this tree rises to forty or fifty feet high, and is two feet in diameter.—Native of South America; flowering in November, in the province of Guiana.

3. Sloanea Massoni. Leaves cordate, elliptic; stipules linear; calix five-parted; bristles of the capsule very long.—Native of the West Indies, at St. Kitt's.

4. Sloanea Sinemariensis. Leaves roundish, ovate, quite entire; capsules ovate, bristly, opening from the top. This is a tree forty or fifty feet high, with a cloven ferruginous or cinereous bark.—Native of South America and the West Indies; found in Guiana, and in the island of St. Christopher.

Sloe Tree. See *Prunus.*

Smallage. See *Apium.*

Smilax; a genus of the class Dioecia, order Hexandria.—Generic Character. *Male. Calix:* perianth six-leaved, spreading, bell-shaped; leaflets oblong, approximating at the base, bent back and spreading at the tip. *Corolla:* none, unless the calix be taken for it. *Stamina:* filamenta six, simple; antheræ oblong. *Female. Calix:* as in the male, deciduous. *Corolla:* none. *Pistil:* germen ovate; styles three, very small; stigmas oblong, bent back, pubescent. *Pericarp:* berry globular, three-celled. *Seeds:* two, globular. Essential Character. *Calix:* six-leaved. *Corolla:* none. *Female. Styles:* three. *Berry:* three-celled. *Seeds:* two.——The species are,

* *Stem prickly, angular.*

1. Smilax Aspera; *Rough Smilax,* or *Rough Bindweed.* Stem prickly, angular; leaves toothed and prickly, cordate, nine-nerved. Roots perennial, consisting of many thick fleshy fibres, spreading wide and striking deep; stems climbing by means of tendrils like Briony, and hang in festoons from the tops of hedges; flowers white, in small umbellate tufts; berries of a dull scarlet, the size of currants. The knavish druggists in the south of Europe often sell the roots

of this species for those of Sarsaparilla: they have the same qualities, but in an inferior degree, and may be distinguished by being larger, more porous, much less compressed, not so well packed, and fastened by threads or osiers.—Native of the south of France, of Italy, Spain, Carniola, and of Syria; flowering in September.——All the species of this genus grow naturally under hedges and in woods, therefore they should be disposed in such a manner as to imitate their places of growth, and not place them in the open sun, where they will not thrive. The hardy species should be placed under the shade of trees; and the tender kinds may stand between the pots containing tall plants. Such as are tender, must be frequently watered in hot weather, and should then have a large share of air admitted to them; but in winter they must be sparingly watered. They are generally preserved in the gardens of the curious, for the sake of variety; but some of them may be so disposed as to become ornamental, because the first and second species, and the natives of North America, are hardy enough to thrive in the open air in England; and as they retain their verdure all the year, if they be placed on the borders of woods and groves, or in gardens, with their branches properly supported, they will screen the nakedness of the ground under the trees from sight, and in winter, when their leaves are in beauty, they will make a pleasing variety, if intermixed with other evergreens. They may be all propagated by seeds, procured from the countries where they naturally grow, for they do not produce ripe seeds here. Those sorts which have been brought from North America sometimes produce flowers, but our summers are neither warm enough nor sufficiently long to ripen their seeds. On this account they are here propagated by parting their roots; and the best time for this is in autumn, that the offsets or young plants may have time to get good roots before the frost comes on; and if, after they are planted, the cold should come on earlier, or prove more severe, than ordinary, if the surface of the ground about their roots be covered with some old tanners' bark or mulch, to keep the frost out of the ground, it will preserve them: but these roots should not be parted oftener than every third or fourth year, for unless they are large there will be but few stalks to them, and they can then make but little appearance. When the seeds have been obtained from abroad, sow them in pots filled with fresh light earth, and plunged into a moderate hot-bed, observing to water the earth frequently to keep it moist, because the seeds, being hard, will not vegetate without a considerable share of moisture; these generally remain in the ground a whole year before they grow, so that if the plants do not come up the first season, the pots should be kept clean from weeds all the summer; and in winter the hardy sorts should be sheltered from frost under a common frame, and the tender ones plunged into the bark-bed in the stove; the following spring they must be again plunged into the hot-bed, which will bring the plants up very soon. They must then be frequently watered in warm weather, and towards the end of May the hardy sorts should be gradually inured to the open air, and in June may be removed out of the bed and placed abroad in a sheltered situation, where they ought to continue till the frost comes on in autumn, and be then removed into shelter. If the pots be plunged into an old tan-bed under a frame, where they may be protected from the frost, and be exposed to the open air in mild weather, they will thrive much better than with more tender treatment. The tender sorts should be plunged between the other pots in the bark-bed of the stove, where they should remain all the winter; these plants should remain untransplanted in the seed-pots till the following spring, when they must be turned out of the pots, carefully separated, and planted into pots filled with fresh earth; and if the hardy sorts be then plunged into a very temperate hot-bed, it will cause them to take new root speedily, and greatly strengthen them; but the tender sorts should be plunged into a good hot-bed of tanner's bark to bring the plants forward, that they may get strength before winter, when they must be treated as already directed. The hardy species should be kept in pots for two or three years, that they may be sheltered in winter, by which time they will have strength enough to bear the cold in the open air; so in the spring they may be turned out of the pots, and planted where they are designed to remain, observing, if the spring should prove dry, to refresh them now and then with water, as also to lay some mulch about them, to prevent the earth from drying; and while the plants are young, if some mulch is laid about their roots in winter, it will be a sure means of preserving them.

2. Smilax Excelsa; *Tall Smilax*. Stem prickly, angular; leaves unarmed, cordate, nine-nerved. Roots like those of the preceding; flowers yellowish-green; berries red.—Native of Syria. See the preceding species.

3. Smilax Zeylanica; *Ceylon Smilax*. Stem prickly, angular; leaves unarmed; stem-leaves cordate; branch-leaves ovate-oblong.—Native of Ceylon.

4. Smilax Sarsaparilla; *Medicinal Smilax*, or *Sarsaparilla*. Stem prickly, angular; leaves unarmed, ovate, retuse, mucronate, three-nerved. Root perennial, divided into several branches, which are somewhat thicker than a goose-quill, straight, externally brown, internally white, and three or four feet in length. The name is derived from the Spanish *Zarza*, red, and *parilla*, a little vine. At its first introduction, it was considered as an undoubted specific in siphilitic and some chronic disorders; but whether owing to a difference of climate, or other causes, European practitioners soon found that it by no means answered the character which it had acquired in the Spanish West Indies, and therefore it became very much neglected. Many physicians, however, still consider it as a medicine of much efficacy, and assert that the lues venerea is much sooner subdued by giving Sarsaparilla along with mercury. It is in frequent use at most of the London Hospitals; and Dr. Woodville relates, that he has known patients, after the use of mercury, much sooner restored to health by this root, than could have been accomplished by any other medicine with which we are acquainted, especially when in powder. He also recommends the root in rheumatic affections, scrofula, and cutaneous complaints, where an acrimony of the fluids prevails. It may be given in decoction or powder, and should be continued in large doses for a considerable time. Infants who have received the venereal infection from their nurses, though covered with pustules and ulcers, may be cured by the use of this root, without the help of mercurials; and the best way of giving it to such, is to mix the powdered root with their food.—Native of America, Peru, Brazil, Mexico, and Virginia. It flowers in July and August, and was first introduced into Spain as a medicine about the middle of the sixteenth century. For its propagation and culture, see the first species.

5. Smilax Oblongata. Stem prickly, angular; leaves oblong, acuminate, smooth, three-nerved; nerves prickly underneath; branches subdivided, diverging, round, rigid, prickly, with raised decurrent lines between the prickles; flowers in peduncled umbels, many together; peduncles shorter than the petioles.—Native of the West Indies.

6. Smilax Quadrangularis. Plant aculeated; stem tetragonal, unarmed above; leaves unarmed, ovate, subcordate, acute, five-nerved; berries black.—Grows in dry woods, on the edges of ponds, from Pennsylvania to Georgia.

7. Smilax Ovata. Leaves unarmed, ovate-acute, cuspidate, trinerved; common peduncle shorter than the petiole; berries black.—Grows near Savannah in Georgia. The leaves of this plant are very shining on both sides.

8. Smilax Alba. Stem obsolete-angular; leaves elongate-lanceolate, coriaceous, glabrous, very entire, trinerved; umbels with few flowers, having very short peduncles; berries white.—In sandy grounds on the edge of rivulets in Carolina.

** *Stem prickly, round.*

9. Smilax China; *Chinese Smilax.* Stem prickly, roundish; leaves unarmed, ovate-cordate, five-nerved. The root is as large as a child's hand, twisted, full of knots, reddish on the outside, flesh-coloured in the heart, and destitute of smell. It was brought into Europe in the 16th century, as a cure for the venereal disease, and for chronic, cutaneous, and rheumatic disorders: it is farinaceous, and nearly insipid to the taste.—It is successfully employed as a medicine in the Chinese province of Ho-Nansi, where it abounds; and is also used instead of Rice. Browne says, this plant is common in the cool inland parts of Jamaica, where it rises from a thick porous root, and climbs by a pretty slender rigid stem to the top of the tallest trees. He observes, that the root is commonly used in Jamaica, where it is found to answer as well as that from the East Indies; he also thinks that it might be easily propagated so as to supply the European markets; but what grows wild is more than sufficient to supply the inhabitants, and serves frequently to feed the hogs when there is a scarcity of wild fruit.

10. Smilax Rotundifolia; *Round-leaved Smilax.* Stem prickly, round; leaves unarmed, cordate, acuminate, five or seven nerved.—Native of Canada.

11. Smilax Laurifolia; *Bay-leaved Smilax.* Stem prickly, round; leaves unarmed, ovate-lanceolate, three-nerved.—Native of Virginia and Carolina.

12. Smilax Tamnoides; *Black Briony-leaved Smilax.* Stem prickly, round; leaves unarmed, cordate, oblong, seven-nerved.—Native of North America.

13. Smilax Caduca; *Deciduous Smilax.* Stem prickly, round; leaves unarmed, ovate, three-nerved; umbels of flowers below the leaves.—Native of Canada.

14. Smilax Pubera. Plant unarmed: leaves oblong, acute, cordate, sub-five-nerved; umbels short, peduncled; pedicels very short; berries oblong, acute, white.—Found in the shady woods of Carolina and Georgia.

15. Smilax Panduratus. Plant aculeate; leaves panduræform, acuminate, trinerved; common peduncle as long again as the petiole. Leaves smooth and shining on both sides.—Found in sandy woods from New Jersey to Carolina.

*** *Stem unarmed, angular.*

16. Smilax Australis. Stem round, very prickly; leaves ovate-oblong, acute, five-ribbed, smooth; tendrils in pairs on the footstalks.—Found near Port Jackson, New South Wales.

17. Smilax Bona Nox; *Ciliated Smilax.* Stem unarmed, angular; leaves ciliate, prickly. It flowers in June and July.—Native of North America.

18. Smilax Herbacea; *Herbaceous Smilax.* Stem unarmed, angular; leaves unarmed, ovate, seven-nerved. It flowers in July.—Native of North America.

19. Smilax Tetragona; *Square-stalked Smilax.* Stem unarmed, four-cornered; leaves cordate, five-nerved, acuminate, unarmed.—Native place unknown.

20. Smilax Pedunculatis. Stem round, climbing; leaves subrotund-ovate, cordate, acuminate, nine-nerved; umbels with very long peduncles.—Found in old fields on the edges of woods from Canada to Pennsylvania.

21. Smilax Latifolia. Stem angular, without prickles; leaves ovate, five-ribbed, smooth, somewhat heart-shaped; footstalks bearing the tendrils.—Found in the tropical parts of New Holland.

**** *Stem unarmed, round.*

22. Smilax Lanceolata; *Spear-leaved Smilax.* Stem unarmed, round; leaves unarmed, lanceolate; root fusiform, long, not tuberous.—Native of North America, in Virginia and Carolina. Found also in Cochin-china.

23. Smilax Pseudo-China; *Bastard Chinese Smilax.* Stem unarmed, round; leaves unarmed; stem-leaves cordate; branch-leaves ovate-oblong, five-nerved. The Cochin-chinese use the stem for making baskets and other wicker ware. The Chinese call it Cum Kong Cum, and frequently use it instead of the true China root. A small quantity of it, even in cold water, tinges of a deep red; whereas the true root yields a light brown colour.—Found also in Virginia and Jamaica; where it is a shrub, with very large roots, much searched after by hogs.

24. Smilax Ripogonum. Stem unarmed, round, rooting; leaves ovate, lanceolate, acuminate, five-nerved; flowers hermaphrodite.—Native of New Zealand.

25. Smilax Purpurata. Stem unarmed, round, dichotomous; leaves cordate, acute, acuminate, clawed, quite entire, five-nerved; peduncles axillary, umbelliferous.—Native of New Caledonia. The roots have the taste of Glycyrrhiza.

26. Smilax Aristolochiæfolia. Stem prickly, round; leaves unarmed, sagittate, bluntish, three-nerved.—Found at Vera Cruz in New Spain.

27. Smilax Spinosa. Stem prickly, round; leaves ovate-lanceolate; nerves of the leaves prickly underneath.—Found also at La Vera Cruz in New Spain.

28. Smilax Canellæfolia. Stem unarmed, round; leaves unarmed, ovate, three-nerved.—Native of Jamaica, where it climbs upon the trees.

29. Smilax Humilis. Stem unarmed, round; leaves unarmed, ovate, cordate, three-nerved; flowers corymbed; berries red.—Native of Carolina.

30. Smilax Hederæfolia. Stem unarmed, round; leaves unarmed; stem-leaves cordate; racemes ovate, oblong.—Native of Jamaica and Maryland.

Smithia; (so named in honour of James Edward Smith, M. D. F. R. S. &c. President of the Linnean Society, &c.) a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, two-lipped; segments ovate-lanceolate, concave, acute, almost equal. *Corolla:* papilionaceous; standard obcordate; wings oblong, obtuse, a little shorter than the standard; keel linear-oblong, cloven at the base, length of the wings. *Stamina:* filamenta ten, united into two equal bodies; antheræ oblong. *Pistil:* germen contracted at the base of the calix; style capillary, permanent; stigma simple. *Pericarp:* legume enclosed within the calix, composed of from four to seven joints, distinct, connected by the permanent style, orbicular, muricated, one-seeded. *Seeds:* kidney-form, compressed, smooth. Essential Character. *Legume:* with distinct one-seeded joints, connected by the style. *Stamina;* divided into two bodies.——The only known species is,

1. Smithia Sensitiva; *Annual Smithia.* Leaves alternate, abruptly pinnate, composed of from four to ten obovate-oblong leaflets, bristly on the edge, and along the rib beneath; root annual; stem decumbent, round, even; racemes axillary, from three to six flowered; corolla yellow. The leaves fold together when touched, like those of Mimosa Pudica, but more slowly.—It flowers in October, and is a native of the East Indies.

Smyrnium; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal unequal, becoming daily bigger; partial erect; involuere universal none; partial none: perianth proper scarcely apparent. *Corolla:* universal uniform; floscules of the disk abortive: partial of five lanceolate petals, slightly bent in, keeled. *Stamina:* filamenta five, simple, length of the corolla; antheræ simple. *Pistil:* germen inferior; styles two, simple; stigmas two, simple. *Pericarp:* none. *Fruit:* oblong, striated, bipartite. *Seeds:* two, lunulate, on one side convex, marked with three angles, flat on the other. Essential Character. *Petals:* acuminate, keeled. *Fruit:* oblong, striated.——The species are,

1. Smyrnium Perfoliatum; *Perfoliate Alexanders.* Stem-leaves simple, embracing. Biennial, flowering in May.—Native of Candia and Italy. This, like all its congeners, may be propagated by sowing its seeds upon an open spot of ground in August, as soon as they are ripe; for if they are preserved till spring they often miscarry, or at least they do not come up until the second year, whereas those sown in autumn rarely fail of coming up in the spring, and will make much stronger plants than the others.

2. Smyrnium Ægyptiacum; *Egyptian Alexanders.* Floral leaves two, simple, cordate, quite entire.—Native of Egypt.

3. Smyrnium Laterale; *Side-flowering Alexanders.* Stem-leaves ternate, gashed, serrate; umbels lateral, sessile.—Native of the Cape.

4. Smyrnium Olusatrum; *Common Alexanders.* Stem-leaves ternate, petioled, serrate; umbels terminal. Root biennial, fleshy, branched.—This plant was formerly eaten in various parts of Europe, either as a salad or pot-herb, whence, and from its blackness, it acquired the name of *Olusatrum.* Ray says, it was called Alexanders, because in Italy and Germany it has long been denominated Herba Alexandriana; having been supposed to be brought from Alexandria. It flowers in May, and by the middle of July the stalks are dried up, but remain laden with large black seeds. The seeds warm, strengthen, and comfort the stomach, create an appetite, disperse wind, promote urine and the menses, and give relief to the strangury. A decoction of the root may be used for any of the above purposes, when the seeds are not to be procured. The stalks blanched, and eaten plentifully as a salad, are of a warm aromatic quality, and are serviceable in scorbutic complaints.—Native of France, Spain, Italy, Belgium, and Britain. It is rather a maritime plant, and is found near our coasts in many places, as about Scarborough Castle, and in the neighbourhood of Dover. Pennant observes, that it almost covers the S. W. end of the island of Anglesea, where it is boiled and greedily eaten by sailors returning from long voyages. It is very common in all the western counties, and in the flat parts of Gloucestershire; on the ramparts of Poole going into Wareham, and in may other places in Dorsetshire. It occurs also about many inland towns, as Nottingham, York, Bury, Newmarket, Mackerell's Tower, Norwich; Bungay in Suffolk; several places in Cambridgeshire; near Bensington in Oxfordshire; between Great Comberton and Woller's Hill; at Hill Croome and Perton, in Worcestershire; in the neighbourhood of London, about Deptford, Vauxhall, and Battersea; at Cowley in Middlesex; at Cliffe in Kent; and on the coast of Dunglass, Berwickshire, Scotland.—Sow the seeds as directed for the first species; and in the spring, hoe the plants out, so as to leave them ten inches or a foot apart each way; and during the following summer, they must be constantly cleared from weeds, which, if permitted to grow among them, will draw them up slender, and render them good for little. In February following, the plants will shoot up vigorously, at which time the earth must be drawn up to each plant, to blanch them, and in three weeks after they will be fit for use, when they may be dug up, and the white part preserved, stewed, and eaten as Celery.

5. Smyrnium Apiifolium; *Smallage-leaved Alexanders.* Stem-leaves wedge-shaped, obtuse, trifid, toothed.—Native of Crete or Candia.

6. Smyrnium Aureum; *Golden Alexanders.* Leaves pinnate, serrate, hinder ternate; all the flowers fertile. Root perennial, black, and thick, with clustered fibres. Each stem and branch is terminated by an umbel of very small yellow flowers. The whole plant is acrid, bitter, and aromatic.—Native of North America.

7. Smyrnium Integerrimum; *Entire-leaved Alexanders.* Stem-leaves doubly ternate, quite entire. Root perennial.—Native of Virginia.

8. Smyrnium Atropurpureum. All the leaves ternate; leaflets ovate, acute, serrate. Flowers dark purple.—Grows on the dry slate-hills of Virginia and Carolina.

9. Smyrnium Nudicaule. Radical leaves triternate; leaflets unequally few-dentated; scape radical; umbel with elongate rays; involucre and involucels almost none.—Grows on the Columbia river. The natives eat the tops of this plant, and boil it in their soups, the same as we use Celery.

Snail Flower. See *Phaseolus Caraccalla.*

Snail Trefoil. See *Medicago.*

Snake Gourd. See *Tricosanthes.*

Snake Root. See *Actæa, Aristolochia Arborescens, Eryngium Aquaticum,* and *Polygala Senega.*

Snake Weed. See *Polygonum Bistorta.*

Snap Dragon. See *Antirrhinum.*

Sneezewort. See *Achillea.*

Snowball Tree. See *Viburnum.*

Snow Berry. See *Chiococca.*

Snow Drop. See *Galanthus.*

Snowdrop Tree. See *Chionanthus* and *Halesia.*

Soap Berry. See *Sapindus.*

Soapwort. See *Saponaria.*

Soda. See *Salsola.*

Solandra; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, large, angular, permanent, three-cleft or five-cleft; segments lanceolate, erect. *Corolla:* one-petalled, funnel-form, very large; tube bell-shaped, ventricose, a little shorter than the calix; border five-cleft; segments roundish, waved, patulous. *Stamina:* filamenta five, filiform, length of the tube, ascending at top; antheræ oblong, versatile. *Pistil:* germen superior, oval; style filiform, longer than the stamina, bent in; stigma obtusely bifid; segments ovate. *Pericarp:* berry oval, conical at top, smooth, four-celled. *Seeds:* very numerous, oblong, nestling. Essential Character. *Calix:* tubular, bursting. *Corolla:* clavate, funnel-form, very large. *Berry:* four-celled, many-seeded.——The only species is,

1. Solandra Grandiflora; *Great-flowered Solandra.* Stem and branches round; wood spungy; leaves scattered, most crowded about the ends of the branches, obovate, oblong, acute, quite entire, smooth, thickish, and somewhat succulent, from three to seven inches in length, on round smooth petioles five times shorter than the leaves. Flowers terminating, subsessile, subsolitary, very large: they are very handsome and sweet, and appear in the months of January and February. The fruit is sometimes the size of a hen's egg, white, red within; it ripens in August, and is of a sweet subacid flavour.—Native of Jamaica; found on very large trees, being scandent and parasitical. It is there called Peach-coloured Trumpet Flower.

Solanum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, half five-cleft; segments erect, acute, permanent. *Corolla:* one-petalled, wheel-shaped; tube very short; border large, half five-cleft, from reflex flat, plaited. *Stamina:* filamenta five, awl-shaped, very small; antheræ oblong, converging, subcoalescent, opening at the top by two pores. *Pistil:* germen roundish; style filiform, longer than the stamina; stigma blunt. *Pericarp:* berry roundish, smooth, dotted at the top, two-celled, with a convex fleshy receptacle on each side. *Seeds:* very many, roundish, nestling. Essential Character. *Corolla:* wheel-shaped. *Antheræ:* subcoalescent, opening at top by a double pore. *Berry:* two-celled. ——The species are,

* *Unarmed.*

1. Solanum Laurifolium; *Bay-leaved Nightshade.* Stem unarmed, arboreous; leaves petioled, ovate-oblong, tomentose beneath; panicle terminating, dichotomous, divaricating. This tree produces black berries, the size of a large currant. —Native of the forests of Surinam.

2. Solanum Verbascifolium; *Mullein-leaved Nightshade.* Stem unarmed, shrubby; leaves ovate, tomentose, quite entire; corymbs bifid, terminating. Flowers produced in small umbels from the side of the stalks, standing erect; they are pretty large, and white, with the petal cut into five star-pointed segments.—Native of America; found also in the mountain-woods of Martinico, flowering in November. This may be increased by cuttings, planted in a shady border during any of the summer months; when rooted, take them up, plant them in pots, and place the pots in the shade till they have taken new root. This, and all the species from the Cape of Good Hope, require an open airy glass-case, or warm greenhouse, in winter; but in summer may be placed abroad in a warm sheltered situation.

3. Solanum Auriculatum; *Ear-leaved Nightshade.* Stem unarmed, shrubby; leaves ovate, acuminate, tomentose, quite entire; stipules cordate; corymbs bifid, terminating. This is very like the preceding species. It flowers here in April. —Native of the Mauritius, Madagascar, and Bourbon.

4. Solanum Pubescens; *Pubescent Nightshade.* Stem unarmed, tomentose, shrubby; leaves ovate, decreasing at the base, quite entire, pubescent; racemes subumbelled; flower large, purple-coloured.—Native of the East Indies.

5. Solanum Bombense; *Tierra Bomba Nightshade.* Stem unarmed; frutescent; leaves oval, attenuated to both ends, quite entire; racemes cymed.—Native of Tierra Bomba, near Carthagena in America.

6. Solanum Pseudo-Capsicum; *Shrubby Nightshade*, or *Winter Cherry.* Stem unarmed, shrubby; leaves lanceolate, repand; umbels lateral, sessile. Stem bushy, three feet high; leaves stalked, evergreen, about two inches long. The flowers are white; and are succeeded by berries as large as small cherries, which ripen in winter. There are two varieties; one with red, and the other with a yellowish fruit.—Sow the seeds in a pot of rich earth in the spring, place it in a moderate hot-bed, and water the earth frequently. When the plants come up, plant them in another moderate hot-bed, covered with rich earth about six inches thick, at six inches' distance every way: arch the bed over with hoops, cover it occasionally with mats, to shade the young plants from sun and cold, and water them frequently. When they have acquired strength, and the season becomes favourable, inure them by degrees to the open air, and expose them fully to it in June, when they should be taken up with a ball of earth to the root of each plant, and placed separately in pots filled with rich earth, in a shady situation, and frequently watered until they have taken new root; after which, remove them to a more open exposure among other exotic plants, giving them plenty of water in dry weather. In the winter, remove them into the green-house, placing them in the coldest part, where they may have as much free air as possible in mild weather, for they require only to be sheltered from severe frost, and are so hardy as frequently to endure the cold of our ordinary winters abroad. Shift the plants annually about the end of April; paring the roots round, cutting off all the mouldy fibres next the pot, and filling up the pots with fresh rich earth, to strengthen the flowers, and produce plenty of fruit.

7. Solanum Microcarpum; *Small-fruited Nightshade.* Stem unarmed, shrubby; leaves ovate-lanceolate; umbels lateral, peduncled.—Native of Egypt.

8. Solanum Terminale; *End-flowering Nightshade.* Unarmed, frutescent: leaves lanceolate-ovate, mostly quite entire, hairy; umbels terminating.—Native of Arabia Felix.

9. Solanum Pauciflorum; *Few-flowered Nightshade.* Leaves ovate, quite entire; branches and calices ten-toothed, tomentose; peduncles axillary, in pairs, one-flowered.—Native of the island of Martinique.

10. Solanum Diphyllum; *Two-leaved Nightshade.* Stem unarmed, shrubby; leaves in pairs, one smaller than the other; flowers in cymes. This is a stinking evergreen, two or three feet high; corolla white. It flowers the whole summer.—Native of the West Indies.

11. Solanum Fugax; *Fugacious Nightshade.* Stem unarmed, shrubby, dichotomous, divaricating; leaves lanceolate, quite entire, smooth; peduncles solitary, axillary, one-flowered; calix ten-toothed.—Native of the Caraccas.

12. Solanum Geminatum; *Two-flowered Nightshade.* Leaves ovate, quite entire; calices ten-toothed, smooth; peduncles axillary, in pairs, one-flowered; stem scandent. This is an unarmed shrub.—Found at Cayenne.

13. Solanum Retrofractum; *Broken Nightshade.* Leaves ovate, smooth; branches axillary, retrofracted; umbels axillary and terminating, sessile; calices truncate.—Native of South America.

14. Solanum Stellatum; *Starry Nightshade.* Stem unarmed, shrubby, scandent, flexuose; leaves ovate, smooth, acuminate; peduncles subgeminate, one-flowered, axillary; calices unequally toothed; flower elegant, but scentless; corolla large, spreading very much, thin, rounded, blue, with a five-rayed star; berry globular, the size of a pea.—Native place uncertain.

15. Solanum Dulcamara; *Woody Nightshade,* or *Bitter-Sweet.* Stem unarmed, frutescent, flexuose; upper leaves hastate; racemes cymed, drooping; fruit elliptical. Root perennial, woody, smelling like the Potato; berries scarlet, very juicy, bitter, and poisonous. The roots and stalks, upon being chewed, first cause a sensation of bitterness, which is soon followed by a considerable degree of sweetness, whence the plant obtained the name of Dulcamara or Bitter-Sweet. The berries excite vomiting and purging. Floyer says, that thirty of them killed a dog in less than three hours, and were found undigested in his stomach. As they are very common in hedges, and may be mistaken by children for red currants, this circumstance is well worthy of notice. Whenever they have unfortunately been eaten, it is adviseable to pour down as much warm water as possible, to dilute and weaken the poison, and to provoke vomiting, until medical assistance can be obtained. The old botanists recommended this plant as a medicine in many diseases. Ray informs us, that the inhabitants of Westphalia make use of a decoction of the whole plant, as their common drink, with success against the scurvy. Boerhaave says, it is a medicine far superior to China-root

and Sarsaparilla, as a sweetener and restorative; he prescribes an infusion of the twigs in boiling water, to be taken to the quantity of a very large tea-cupful three or four times a day, as a sweetener of the blood and juices, for which purpose it is a most excellent medicine. Linneus says, that an infusion of the young twigs is an admirable medicine in acute rheumatisms, inflammations, fevers, and suppression of the lochia. Dr. Hallenberg advises it in ischiatic and rheumatic pains, jaundice, scurvy, and lues venerea. They direct a pint of boiling water to be poured upon two drachms of the stalks, sliced and dried; and, after standing half an hour, to boil it ten or fifteen minutes. The dose is about two tea-cupsful, morning and evening. Haller observes, that this plant partakes of the milder qualities of Common or Garden Nightshade, joined to a resolutive and saponaceous quality. Murray and Bergius approve of it as a promoter of all the secretions: the latter confines its use to rheumatism, and retention of the menses and lochia. But, according to other good authorities, it has been applied with advantage in some obstinate cutaneous affections. Dr. Cullen says, we have employed only the slender twigs; but some parcels of these were very mild and inert, others considerably acrid; in the latter state we have employed a decoction of them in the cure of rheumatism, sometimes with advantage, but at other times without effect: though inserted in the catalogue of diuretics, it never appeared to us as powerful in this way. The twigs should be gathered either in spring or autumn, but will be found most powerful in the latter season. If it be used dry, a somewhat larger dose must be taken. It is generally given in a decoction or infusion; and, to prevent it from exciting vomit, it should be diluted with milk; small doses also are recommended at the beginning, for large ones have been found to produce convulsions, delirium, and palsy of the tongue. A tincture, made by infusing four ounces of the twigs in a quart of white wine, is, in my opinion, the best preparation of it, and may be taken in doses of four or five ounces, in which quantities it operates by sweat, urine, and stool. It is one of those many neglected plants, which deserve to be better known.—Meyrick says, there are several varieties, one with flesh-coloured, and sometimes with white flowers; another with hairy leaves; a third, with larger paler-coloured flowers, opening only about noon, the segments less acuminate, and not reflexed; and another, with variegated leaves, which is preserved by those who are curious in collecting striped-leaved plants.—This plant is a native of Europe, Africa, and Siberia, growing in moist hedges, shady places, and by the sides of ditches; flowering in June and July, and ripening its poisonous berries in September and October. All the varieties of this species are very handsome, and may be easily propagated by laying down the branches, or planting cuttings in the spring, upon a moist soil, where they will soon take root, and may afterwards be transplanted where they are intended to remain.

16. Solanum Triquetrum; *Triangular-stalked Nightshade.* Stem unarmed, frutescent, three-sided; leaves cordate, acuminate, smooth; umbels opposite to the leaves, subpeduncled; corolla white, very deeply divided into five linear curled segments.—Found flowering in September, at the Royal Garden at Madrid.

17. Solanum Scandens; *Climbing Nightshade.* Unarmed: stem twining; leaves ovate, cordate at the base, hanging down, very soft beneath; peduncles terminating. Branches long and flaccid, herbaceous; berry the size of a cherry, with a short calix, contracted and gibbous under the fruit, with five swellings.—Native of Surinam.

18. Solanum Lyratum; *Lyrate-leaved Nightshade.* Unarmed, herbaceous, erect: leaves lyrate, hastate, tomentose.—Native of Japan, near Nagasaki.

19. Solanum Tegore; *Guiana Nightshade.* Stem unarmed, shrubby, very hirsute; leaves petioled, the lower pinnatifid, sinuate, the upper cordate; racemes simple, axillary. Berries globular, yellowish, almost the size of a walnut; seeds flatted and rounded. All parts of the plant exhale a very disagreeable odour. It flowers and fruits in October.—Native of Guiana, by the banks of the river Sinemaria.

20. Solanum Quercifolium; *Oak-leaved Nightshade.* Stem unarmed, subherbaceous, angular, flexuose, rugged; leaves pinnatifid; racemes cymed. Stem four or five feet high, branched, leafy. It flowers in July; corollas violet-coloured; berries red, ovate.—Native of Peru.

21. Solanum Laciniatum; *Cut-leaved Nightshade.* Stem shrubby, unarmed, very smooth; leaves pinnatifid; segments lanceolate, acute; panicles axillary, by twos or threes. It flowers in July and August.—Native of New Zealand, &c. Mr. Curtis, who cultivated this species, observes, that it is a plant of some beauty, and remarkable for receding from the common character of the genus, in having the antheræ widely separated from each other; also, that the pulp of the berries is sweet, tasting something like a fig.

22. Solanum Radicans; *Rooting Nightshade.* Stem unarmed, herbaceous, even, roundish, prostrate, rooting; leaves pinnatifid; racemes cymed.—Native of Peru.

23. Solanum Havanense; *Havannah Nightshade.* Stem unarmed, frutescent; leaves oblong-lanceolate, quite entire, shining; racemes axillary.—Found at the Havannah, flowering in January; and at Jamaica, flowering in June.

24. Solanum Triste; *Dull Nightshade.* Stem unarmed, frutescent; leaves lanceolate-oblong, subrepand, smooth; racemes subcymed. Flowers small and white; berries globular, of a dirty yellow colour.—Native of Martinico.

25. Solanum Racemosum; *Wave-leaved Nightshade.* Stem unarmed, frutescent; leaves lanceolate, repand, waved; racemes long, straight. Corolla snow-white, cut very deeply into lanceolate-oblong segments, scentless; berries red, the size of a small pea.—Native of the West Indies.

26. Solanum Corymbosum; *Ovate-leaved Nightshade.* Stem unarmed, suffruticose; leaves ovate-lanceolate, entire, acuminate at the base; flowers corymbed. Corolla blue; berry size of a pea, orange-coloured; seeds few and pale. It flowers in July.—Native of Peru.

27. Solanum Quadrangulare; *Square-stalked Nightshade.* Stem unarmed, frutescent, four-cornered; leaves ovate, entire, and angular; flowers panicled. It varies with lanceolate entire leaves.—Native of the Cape.

28. Solanum Repandum; *Repand-leaved Nightshade.* Stem unarmed, subherbaceous, flexuose, even; leaves ovate, repand, tomentose; peduncles axillary, cymed.—Native of the Marquesas, and Society Isles.

29. Solanum Bonariense; *Tree Nightshade.* Stem almost unarmed, shrubby; leaves ovate-oblong, sinuate, repand, rugged. Flowers white, large, nodding, tomentose on the outside; antheræ yellow: berries yellow, scarcely half an inch broad.—Native of Buenos Ayres.

30. Solanum Macrocarpon; *Large-fruited Nightshade.* Stem unarmed, suffruticose; leaves wedged, repand, smooth. Flowers large, blue, bell-shaped, erect, on short peduncles, many of them barren; berries the size of an apple, globular, yellow, subsessile.—Native of Peru.

31. Solanum Tuberosum; *Tuberous-rooted Nightshade*, or *Common Potato.* Stem unarmed, herbaceous; leaves pinnate, quite entire; peduncles subdivided. The flowers are white or tinged with purple; or, as Gerarde describes them,

of a light purple, striped down the middle of every fold or welt with a light show of yellowness. The fruit is a round berry, but black when ripe, and containing many small, flat, roundish seeds.—This root, which at the present moment forms such an important and indispensable article in the diet of the poor, and is cultivated in such immense quantities to meet the incessant demands of every market, was, about two centuries ago, only retained as a curiosity in some botanic gardens. Gerarde, the celebrated gardener to Queen Elizabeth, so often mentioned in the course of this work, informs us in his Herbal, published in 1597, that he received the roots of it from Virginia, which grew and prospered in his garden, as well as in their own native country: but, although the fact be certain that this root came to us from Virginia, it by no means follows that it is indigenous of that country; on the contrary, some think it will appear more probable that it was first found by the Spaniards in Peru. The root called Batata by the Spaniards, whence our name Potato, was common in Italy before the sixteenth century, where it is said to have been as generally eaten with mutton as Turnips or Parsneps, and also to have been used for feeding hogs; but if this had been the Potato now in general use, it is not probable that so much public attention would have been excited by discovering that it was a native of the New World as well as of the Old. For granting that it were, like the Convolvulus Batata, a native of Peru, it is not less probable that it should also be found in Virginia, from whence there is now strong reason to suppose that Sir Walter Raleigh imported it into Ireland; and it is not a little remarkable, that neither in Italy, Spain, Portugal, nor even in France, has it ever been very generally cultivated or highly esteemed. In Italy the prejudice against it was so great, that not half a century since, when a ship load was sent to Naples, to relieve the wretched inhabitants from a famine, it is said that they chose to perish rather than feed upon them: and although they have since grown wiser, especially in the northern parts of that country, still the Potato is not in general use, and a strong prejudice still exists against them, even in Portugal and Spain. The ludicrous story advanced by Holt in his *Characters of the Kings of England*, where the great and lamented Walter Raleigh is represented as mistaking the fruit as the edible part, is wholly without foundation. One consideration only will prove it to be a mere fiction; it is this, that the Spanish Batata, already mentioned, had been long well known to all Europe; and how then could it happen that Sir Walter Raleigh should overlook their near resemblance, and fall into so gross a mistake? It is generally agreed, that the Potato quickly passed over from Ireland into Lancashire, where it has ever since been cultivated with extraordinary diligence and success, both as to the time in which it is brought to market, and to the superior excellence of new varieties, which they are continually raising from seed. Parkinson, in 1629, remarks, that the Potatoes of Virginia are dressed in the same way as the Spanish kind: that is, being roasted under the embers, peeled, and sliced, they were put into sack with a little sugar; or, they were baked with marrow, sugar, spice, &c. in pies; or preserved and *candied* by the comfit-makers. The importance of this root attracted the attention of the Royal Society in the third year after its formation, when a letter from Mr. Buckland, a Somersetshire gentleman, was read: in this letter he recommended the planting Potatoes in all parts of the kingdom, to prevent famine; and had not his judicious advice been long since followed, there would have been many dreadful famines; to prove the fact, we need only remind our readers of every deficient harvest which has occurred within his own recollection, and particularly of those preceding the years 1797-8, when the poor must have perished in great numbers, had it not been for this wholesome and most nutritious root. The letter above mentioned was referred to a committee of the Royal Society, who thanked Mr. Buckland in their Report, which entreated those gentlemen who had lands, to plant them; and requested the pious and patriotic John Evelyn to mention their proposal at the close of his *Sylva*. It appears, however, that Evelyn did not think proper to comply with the request; for he seems not to have noticed the Potato any where except in the Appendix to his *Acetaria*, where he calls it, "a small green fruit, which being pickled is an excellent salad;" though in this, as it refers to the most unpalatable part of the plant, we suspect few persons will agree with him in opinion. He adds, that the root being roasted under the embers or otherwise, is opened with a knife, the Potato is buttered in the skin, and seasoned with a little salt and pepper. Some, he continues, eat them with *sugar*, together with the skin, which has a pleasant crimpness; they are also stewed, and baked in pies. Houghton, in 1699, asserts, that Potatoes were brought from Ireland, where they had supported the people when all their corn was destroyed by the wars, into Lancashire; where they then abounded, and began to spread all over the kingdom: it is amusing to observe how gravely he adds, "they are a pleasant food roasted or boiled, and eaten with butter and *sugar!*" From these, and from subsequent testimonies, it is clear that until the middle of the last century, the Potato, as an esculent root, was still unknown in many parts of the country, and in France at that time was looked upon with contempt, and left wholly to the lower people; so that though it afterwards became the fashion for a time, it almost immediately fell back again into disrepute. Thirty or forty years ago, says Mr. Billingsley, (the Somersetshire reporter under the Board of Agriculture, in 1798,) it was an extraordinary thing to see an acre of Potatoes in one spot, and in one man's possession; whereas there are now many parishes in that county that can produce fifty acres. In the preceding year, Arthur Young informs us, that in Suffolk this root had not been cultivated till within a few years; and in 1800 it appears that Potatoes had become an universal article of diet in the North Riding of Yorkshire, where they still constitute the most essential article of the sustenance of the lower orders. It has now found its way into every part of Wales and Scotland, and is cultivated to a very great extent in the Highlands of the latter country. When the Virginian Potato became first known in Europe, all the fancied properties of the Spanish were attributed to it by some; whilst others reprobated it as producing the leprosy; and a modern writer has attempted to persuade the good people of this country, that it is a most noxious root, and has a great tendency to produce insanity! The general opinion, however, still considers it as a wholesome and a nourishing food. The farinaceous varieties make a good starch, and bread, either mixed with Wheat flour, or even by themselves; though it is admitted that Potatoes are best eaten either boiled or baked, whether by men or animals.—To enumerate all the varieties which have been raised from seed would be impracticable: the following are the best known, and most esteemed. 1. *Apple;* one of the kidney variety, cultivated in Ireland, and the Isle of Man. 2. *Black-a-moor;* which is a late sort, and keeps well till August. It is very heavy, and yields a good deal of starch: it is fit either for cattle or for the table. The outer coat is sooty, but appears, when rubbed, of a dark or bright purple. It will grow in moist heavy soils. 3. *Champion.* This has been preferred in Essex, because it did not curl: it is early, and is also called Globewhite. 4. *Cluster* or *Con-*

glomerate, called also the Suffolk or Howard, and in Kent the Hog Potato. It is red, and streaked with red within, having a saccharine taste, for which some persons highly value it. 5. *Early Cumberland.* This is a large, prolific, and well-flavoured sort, which ripens early enough to produce a second crop. 6. *Goldfinders.* This is cultivated in the midland counties: it is a good sort, yellow within, kidney-like, with a scurfy rind. 7. *Kidneys.* There is a great variety of this sort, both whites and reds: as, the Lincolnshire, the large and small Red-nose, which last is subject to curl; the White, the Flat White or True Spanish; the Superfine White, said to be the earliest Potato in Lancashire, where four crops in a year are sometimes raised on the same ground; the Manley White, which is large, white, mealy, and well-tasted; the Blood-red; the Irish Red, or Painted Lord, which is late and plentiful; Old Winter Red, which is peculiarly good in spring, when others have lost their flavour; it never has the curl: Rough Red; Purple; Red French, Irish; Red-snout or Red-nob, large, prolific, and well-flavoured, but it becomes rather strong-tasted in the spring: Winter White, and Whiteblossom; good for the table, larger, and producing a more bulky crop than the Champion. 8. *Ox Noble*, for cattle This is often confounded with the White Cluster, but is different; it is sometimes called White Surinam; large and prolific, but liable to grow hollow. 9. *Pink Eye*, or *Red Streak;* is hardy and strong; is late, and eats best from spring to July. 10. *Russet*, *Red* and *White*, for winter use. 11. *Surinam* or *Hog Potato*, is often confounded with the true Cluster: it is white and red, and very prolific. 12. *Yam.* This is not the West Indian Yam, but a coarse Potato, raised principally for horses; it grows abundantly even on indifferent land.—A patent has been recently obtained at Paris, and a gold medal bestowed, along with other honorary distinctions, granted for the discovery, and practice on a larger scale, of preparing from Potatoes a fine flour, a sago, a flour equal to ground rice, and a semolina or paste, of which one pound is equal to a pound and a half of rice, to a pound and three quarters of vermicelli, and to eight pounds of raw Potatoes. An excellent bread, it is said, can be made of this flour, at half the cost of wheaten bread. These preparations are found valuable to mix with wheaten flour for bread, or to make biscuits, pastry, pie-crusts, and for all soups, gruels, and panada. Simply mixed with cold water, they are in ten minutes fit for food, when fire cannot be obtained; and twelve ounces are sufficient, in cases of necessity, for a day's sustenance. The physicians and surgeons of the French hospitals have successfully employed these preparations of Potato flour in cases of great debility of the stomach. The essence of the discovery is, to produce a cheap preparation from the surplus growth of Potatoes, which are thereby converted into a keeping stock in a convenient and salubrious form. Heat being an agent employed in the preparation, these articles will keep unchanged for years, as, for instance, to China and back; neither will rats and mice destroy, nor insects or worms infest, this newly-fabricated flour.—*Propagation and Culture.* The Potato is generally propagated by its roots, which multiply immensely if planted in a suitable soil. The common way is, to plant either the small roots or offsets entire, or to cut the larger roots into pieces, preserving a bud or eye to each; but when the smaller offsets are planted, they produce generally a greater number of roots, which are always small, and the cuttings of the larger roots are apt to rot, especially if wet weather happens soon after they are planted: hence it is best to make choice of the finest roots, and to allow them more ground than usual, both between the rows, and also from plant to plant. The soil in which they thrive best is a light sandy loam, not very dry nor very moist: it should be well ploughed two or three times, in order to break and divide the parts, and the deeper the ploughing the better. In the spring, just before the last ploughing, there should be a good quantity of rotten dung spread on the ground, and ploughed into it in the beginning of March, if the season proves mild; otherwise it had better be deferred till the middle or latter end of that month; for if it should prove hard frost after the roots are planted, they may be greatly injured, if not destroyed, thereby; but the sooner they are planted in the spring, after the danger of frost is over, the better it will be, especially in dry land. In the last ploughing, the ground should be laid even, and then the furrows should be drawn at three feet distance from each other, about seven or eight inches deep. In the bottom of this furrow the root should be laid at about one foot and a half asunder; then the furrow should be filled with the earth which came out, and the same continued through the whole field or parcel of land intended to be planted. After all is finished, the land may remain in the same state till near the time when the shoots are expected to appear above ground, when the ground should be well harrowed over both ways, which will break the clods, and make the surface very smooth; and by doing it so late it will destroy the young weeds, which by this time will begin to make their appearance; and this will serve the expense of the first hoeing, and will also stir the upper surface of the ground, which, if much wet has fallen after the planting, is often bound into a hard crust, and will retard the appearance of the shoots. The rows being placed at three feet asunder, will allow the horse-plough to be introduced between them, which will greatly improve them by stirring and twice breaking the ground, which will not only destroy the weeds, but enable every shower to penetrate to the roots, and greatly improve their growth. These operations ought to be performed early in the season, before the stems or branches of the plants begin to fall, and trail upon the ground; because after that it will be impossible to do it without injuring the shoots. If these ploughings be carefully performed between the rows and the ground between the plants hand-hoed, it will prevent the growth of weeds till the haulm of the plants cover the ground, after which there will be little danger of weeds injuring the crop; but as the plough can only go between the rows, it will be necessary to make use of a hoe to stir the ground, and destroy the weeds in the rows, and, if it be done carefully in dry weather, the ground will be kept clean until the Potatoes are fit to take up. In places where manure is scarce, many persons scatter dung only in the furrows where the roots are planted; but this is a very poor method, because when the Potatoes begin to push out their roots, they are soon extended beyond the width of these furrows, and the new roots are commonly formed at a distance from the old, out of the reach of this manure, by which they cannot be benefited. And as most of the farmers desire to have a crop of Wheat after the Potatoes are taken off the ground, so the land will not be so thoroughly dressed in every part, nor so proper for this crop, as when the manure has been equally spread and ploughed in all over the land. Where this is done, the land will produce a fine crop of Wheat afterward, and very few Potato-shoots will appear among the Wheat; which is probably owing to the farmer's planting only the largest roots; for when they have forked them out of the ground in the following autumn, there have been six, eight, or ten large roots, produced from each, and often many more, and scarcely any small roots among them; whereas in such cases where the small roots have been planted, there has been a vast number of very small roots produced, many

of which were so minute as not to be discovered when the roots were taken up, and so have grown the following season, to the great injury of the crop then on the ground. The haulm of these Potatoes is generally killed by the first frost in the autumn; and the roots should be taken up soon after, and laid up in sand in a sheltered place, where they will keep dry, and be secured from frost. The growers near London do not wait for the decay of the haulm, but begin to take up part of them as soon as their roots are grown to a proper size for the market, and so keep taking up from time to time, according to the demand. There are also others, who do not take them up so soon as the haulm decays, but let them remain much longer in the ground; in which there is no hurt done, provided they be taken up before hard frost sets in, which would destroy them; unless where the ground is wanted for other crops, in which case the sooner they are taken up the better, after the haulm decays. When laid up, they require a good quantity of sand or earth between them, to prevent their heating; and on that account also they ought not to be laid up in very large heaps.—*Diseases.* The Potato is subject to a disease commonly called the *curl*, and in this state is sometimes called frizzled, or rose-headed. These names are given it from the obvious appearance of the leaves in this disease; but the destructive effect of it falls upon the bulbs of the root, which become worse and diminish in size in proportion to its influence. A variety of causes are assigned for this disease. 1. That the sets are unsound. 2. Forcing the plants from which the sets are taken, by too much fresh dung, and earthing them up too deep, on land too rich and in a southern aspect, and choosing sets from bulbs rendered large by this management. 3. Planting the same sorts too long on the same land. 4. Taking the sets from such bulbs as have been heated or frosted in the heaps. 5. The first shoots being broken off before planting, by which means the sets are weakened. 6. Planting too near the surface, and in old worn-out ground. 7. Planting indiscriminately sets of new sorts raised from the seeds. 8. Insects attacking the sets or roots, or young shoots. 9. Unfavourable soils and seasons. One or more of the above causes may operate in producing this disease; and any or all of them, in different circumstances. He must be a careless cultivator indeed, who will plant distempered or vitiated sets; and he deserves to have a bad crop, who sells or eats all his best Potatoes, and plants the worst. Forcing Potatoes by setting them late in a rich soil well manured, having a southern aspect, especially if the summer be hot and dry, or covered with green fern or other litter before the plants appear, is found, by a series of experiments, to produce the curl. The set will be exhausted in feeding the plant; but should the weather become moist and warm towards the end of summer, the plants, especially if they should be earthed, may then produce a plentiful crop of large Potatoes, which will be fit for eating, but, being produced from the stalk after the set was exhausted, will be defective in vegetative power, and the plants from them will be curled. If they were covered, the rain would rot the fern or litter, and penetrate as a manure to the roots: thus the plants are forced to the second growth, and the sets from these bulbs will produce curled plants. Large crops may be raised by earthing and manuring; but these are not fit for planting. A portion of ground should therefore be allotted for raising sets. Planting repeatedly on the same land, or the same sort on similar soils, is very unadviseable, and contrary to general practice with other crops. Potatoes have been grown for several years together on the same spot of rich land with high manuring; and labourers frequently do this in their confined gardens. But unless the sort be changed, it is found frequently to produce the curl; and, on a large scale, they are seldom planted two years together on the same land. Whether the curl be occasioned, as some pretend, by being frost-bitten before or after planting—or, as by others, by being heated in the heaps; or not—no prudent person would use such sets in planting; for they must be weakened, and produce an inferior crop, and will probably suffer by the curl. When the sets have been suffered to exhaust themselves by sprouting, they are unfit for planting. If the Potato be planted too near the surface, or where the staple is very shallow, they will be exposed to frost, and by that means to the curl, besides wanting proper nourishment, and therefore be weak: now weakness, from whatever cause it arise, will probably produce disease. For the same reason, old worn-out varieties are unquestionably improper for plants, as no one can reasonably expect a sound crop from such seed. On dry soils, in a very dry season, Potatoes are very subject to the curl. On the contrary, a very wet season in strong retentive land, though it has not been ascertained to produce that disease, is nevertheless very unfavourable to the growth of these roots. Mr. Marshall adopts the idea, that the old varieties formerly in cultivation, dwindling in produce till they were entirely worn out with disease, new varieties were introduced, and that the disease vanished with the old ones. In confirmation of this, he observed in Rutlandshire, in a large piece of Potatoes, two stripes, which were almost wholly curled; whilst the rest of the ground appeared to be free from the disease. Inquiring into the reason of this difference, he was told, that the healthy plants were a new sort, called Manleys; and the diseased ones, Red-nosed Kidneys, which were heretofore the prevailing sort. The circumstance of the old sorts being now almost entirely cut off by the curl, renders it probable that the disease is incident to declining varieties of Potatoes, as the canker is to declining varieties of fruit. Not only copious dunging is thought by some to bring on the curl, but manuring well with lime or ashes, either of coal or wood. On a deep loam, limed, nearly three-fourths of the crop were curled; whilst a few drills adjoining, not limed, and planted with the same sort of Potato, were perfectly free. The experiment was repeated the year after, with the same result; and the curl has been since observed to prevail most in the districts where much lime or ash manure is used. A moderate quantity, however, of lime, made into a compost with earth, will not injure the root, but be useful in destroying the wire-worm, and other insects which attack the sets. The method of cure is pointed out by the causes of the disease. If it be owing to the soil, that should be improved by sufficient manuring and good management; or it should be given up, if found wholly unfit for Potatoes. If the disorder be occasioned by any defect or weakness in the sets, arising from their having been heated, or frozen, or overforced, or exhausted by shooting, or from whatever cause, care should be taken to procure proper sets, and to change the sorts occasionally. If the land be rich and warm, the crop ought not to be over-earthed; if it be dry, poor, and shallow, it should be well earthed up: for the roots must neither be parched in the sun, nor removed beyond its influence. If very rich dung, by forcing them too much, bring on the curl, spread it over the field and plough it in, rather than put it immediately over or under the sets in the furrows, especially as the latter mode is apt to make the Potatoes scabby. In a proper soil, with good management, planting in the best season, and due attention to procure good sorts in a sound healthy condition; changing the land, or bringing this in with other crops in a regular rotation; changing also the sorts which are intended for sets, or plant-

ing some by themselves for that purpose—the crop will not be generally infested with the curl; or, if a few of the plants should be curled, they must be carefully pulled out. In Lancashire, great attention is paid to changing the sets. If any of their favourite sets are infested with it, they send them to the Moss or Moor-lands to be cured. It is held as a general opinion in Scotland and the northern counties, that Moss or Peat earth prevents the curl. In the North Riding of Yorkshire, in the dales of the Moor-lands, they make use of sets of their own growth, only endeavouring to plant them on a soil different from that on which they grew, as by that means they in a great measure avoid the curl: but in the lower parts, the sets of the kinds for the table are procured either from the Moor-lands or from Scotland; and it is found necessary to renew them every year, for in the third year they are found very generally curled. In the West Riding they procure their sets of Red-nose Kidney from the neighbourhood of Berwick; and until they adopted this plan of changing, they were much troubled by the curl. In Argyleshire they attribute their freedom from the curl to their changing their sets very often, and planting most of them in new mossy ground; this is a strong inducement to cultivate such waste lands.—*Raising from Seed.* It is well known that this is the only way of obtaining new varieties; some of which will be better, and some not so good, as the parent seed. Thus, however, real improvement will be made, as the good will be preferred, and the bad thrown away; and if, as has been already intimated, the old varieties will be found to degenerate in time, which is the case with many vegetables, recourse must be had to the raising from seed, in order to make up for the deficiency. Great attention has been paid to raising their Potatoes of the best quality, from the seeds of the berries, or, as they call it, the Apple or Crab. They are sometimes three years, but always two, in bringing the Potatoes raised from seed to a full size, though it is asserted that, if transplanted in wide distances, they will attain their full size in one season. Every fourteen years it is necessary to bring back the sets from their original seed; and it should not be forgotten, that the increase of Potatoes, when raised from seed, is exceedingly great. The seedlings produce bulbs of all the varieties, and sometimes new ones. There seems to be no real difference, whether the fruit be taken from a round or a kidney Potato. Seed taken from a red Potato, that has flowered in the neighbourhood of a white one, will produce both red and white. To raise these roots from seed, hang a bunch of the berries in a warm room during winter, and in February separate the seeds from the pulp, by washing the berries in water, and pressing them with the fingers. Then dry the seeds upon paper; and in April sow the seeds in drills in a bed well dug, and manured with rotten dung. When the plants are about an inch high, draw a little earth up to them with a hoe, in order to lengthen their main roots. When they are about three inches high, dig them up with a spade, and separate them carefully for planting out in a piece of fresh ground well trenched, sixteen inches apart. As they advance in growth, earth them up once or twice, to lengthen the main roots, and encourage the shoots under ground; and by this management the bulbs, in the course of one season, will arrive at the size of hen's eggs, and the haulm also will be as vigorous as if sets had been planted. Another method is, to sow the seeds in the beginning of March or sooner, on a hot-bed, in lines about nine inches asunder, one-third of an inch deep, and very thin; to water between the lines frequently; and when the plants are risen a little height, to introduce fine rich earth between the lines, to strengthen them; and to admit air freely, and to water them plentifully, before they are transplanted, that they may rise with a large ball of earth to their roots. Old rotten horse-dung and yellow moss are the usual manures. Plant them in trenches, like Celery, with a space of four feet between the trenches, and twelve or fourteen inches between each plant: as they grow up, draw the earth to their stalks, but do not cover the top. When the ground is brought to a level, dig it, and earth up the plants till pretty deep trenches are formed between the lines. With this treatment, they will in the first season produce from a pound to five pounds weight, on a plant, and many considerably more than a hundred Potatoes each; the produce of which, for the next ten or twelve years, will be prodigious.—*Crops following.* There is no doubt that the Potato crop is an excellent preparation for corn, provided the ground was well manured before, and duly hoed after the setting. The frequent stirring of the land by hoeing, and the complete opening of it by taking up the crop, must leave it in a loose and friable state, fit for the reception of seed. If the soil be a strong loam or clay, Wheat may be sown immediately with advantage; but on lighter loams, which are most proper for Potatoes, the land is commonly left in too loose and friable a state for Wheat, and on that account it is more judicious to sow Barley or Oats. It also frequently happens, especially in cold exposed situations, and in wet seasons, that the Potato crop cannot be raised and got off the land before November, which protracts the sowing of Wheat beyond the proper time. In a cold climate, and on a light soil, never sow Wheat after Potatoes, but ridge up your land, and leave it for a sparing crop; and perhaps that on any soil is good husbandry.—*Domestic Uses.* There does not appear to be just ground for the opinion, that the meal of Wheat affords much more nourishment than that of Potatoes; because the proportion of animal matter, which each contains, is too nearly alike to occasion any great difference. To obtain the meal from Potatoes, they are well washed and grated down to a pulp, by a grater or in a hand-mill. The pulp is then put into a hair sieve, and repeatedly mixed with cold water, till the strainings are clear, and the fibrous part perfectly divested of the meal. The former may be set aside for the use of hogs or cows, and the strained liquor suffered to settle, after which the brown-coloured water is poured off, and fresh water repeated, mixed with the sediment, and poured off after it settles, till the water comes off perfectly clear. The sediment is then dried in the sun or in an oven, as quickly as possible, that it may not turn sour. It will keep many years, if kept dry. The quantity of meal will depend on the kind of Potatoes: but in general, one pound of meal may be obtained from seven or eight pounds of the root. By this process the meal is deprived of the greatest part, or all, of one of the ingredients, which is the soluble mucilage. This mucilage by itself is undoubtedly nutritive, and probably may be rendered more so by being mixed with the other constituent parts of the root. It is, however, admitted, that the most ready, profitable, and perhaps salutary mode of using this root as food, is, to prepare it by boiling, and roasting or baking; by the two last methods they are thought to be the most agreeable and nourishing, but the fact probably is, that the boiling is very little understood. It really is amazing, considering the universality of their use, that so vast a majority of those who undertake to boil Potatoes, seldom fail to spoil them; and it is a well-known fact, that in the Metropolis this is generally the case.—*To boil Potatoes.* Select them as nearly as possible of one size, pare off the skins, and wash them clean; then put them into an iron pot, and cover them with cold water: place the whole on the fire, and cause them to boil as soon as possible, then let them boil

slowly: in about ten or fifteen minutes after beginning to boil, try whether they be done enough; if done, pour off all the water, and putting the pot over the fire for about five minutes, throw in some salt, and continue to shake the pot so as to move the potatoes, until all the steam is evaporated. Then cover them close with a clean napkin, and keeping them near the fire, they will continue good-looking and well tasted for near an hour, if necessary. Some dress them in an iron pot, over a slow fire, without any water. Boiling by steam, which has lately become so general, is certainly an improvement; but, the boiling them as above directed, in water, has this material advantage, that it carries off some matter, which is detained in the process by steam, and which injures the flavour of the root. The use of Potatoes, as applied to the sustenance of cattle, is too obvious and simple to require any observation.—It is worthy of remark, that both yeast, or, as it is often called, barm, and also an ardent spirit, may be obtained from Potatoes. To obtain the barm, boil a pound of mealy Potatoes for every quart of yeast to be made, till they are quite soft; skin and mash them very smooth; mix as much in the water in which they were boiled, as will reduce them to the consistency of common yeast, but not thicker: add to every pound of Potatoes two ounces of coarse sugar or treacle; and, when lukewarm, stir in, for every pound of Potatoes, two table-spoonfuls of good new beer-yeast; keep it stirring and warm for twenty-four hours, or till it has done fermenting, when it will be fit for use; but if older the better. It will keep three months in bottles.—Many years ago, it was proposed in Sweden to extract spirit from Potatoes, in order to save corn; and it is said, that they found an acre of land, planted with this root, would yield a greater quantity of spirit than if it were sown with Barley. The practice was tried in Scotland with different degrees of success, supposed to be owing to the different care and attention bestowed in the process. Dr. Anderson obtained, from seventy-two pounds of Potatoes, an English gallon of pure spirit, considerably above proof, and about a quart more below proof. He celebrates it as the finest and most agreeable vinous spirit he ever tasted; somewhat like very fine brandy, but milder, with a peculiar coolness upon the palate, and a flavour as if it had been impregnated with Violets and Raspberries. The potatoes were boiled to a pulp, bruised, and passed through a sieve, with fresh water to separate the skins. The pulp was then gradually mixed with about twenty gallons of cold water; yeast was added to this mixture at a proper temperature, and in ten or twelve hours a fermentation began, and continued for about that time, and was then renewed by stirring it briskly at the same intervals, for a fortnight; at the end of which time it could not be renewed by agitation or otherwise, and was found, upon trial, to have acquired a kind of acid slightly-vinous taste, fit for distillation. It was then cautiously distilled, taking care to stir it till it began to boil, before the still head was applied. The fire was made so strong as to keep it boiling briskly till the whole came over, in order to prevent the thick matter from subsiding and burning to the bottom, which would have given it an intolerably offensive flavour. This experiment has been found to succeed upon a second trial, in every respect, except that the peculiar Raspberry flavour was not produced. Vast quantities of common starch are also made from Potatoes, and of late years it has greatly improved in quality.

32. Solanum Pimpinellifolium; *Burnet-leaved Nightshade.* Stem unarmed, herbaceous; leaves pinnate, quite entire; racemes simple.—Native of Peru. This, and the six following species, are all propagated by sowing their seeds on a moderate hot-bed in March; and when the plants are come up two inches high, they should be transplanted into another moderate hot-bed, at about four inches' distance from each other, observing to shade them until they have taken root; after which they must have frequent waterings, and a large share of fresh air; for if they are too much drawn while young, they seldom do well afterwards. In May they ought to be transplanted either into pots filled with light earth, or into borders near walls, pales, or reed-hedges, to which their branches may be fastened, to support them from trailing on the ground, which they are liable to do, and then the fruit will not ripen. Hence, where these plants are cultivated for the sake of fruit, they should have a warm aspect, with their branches regularly fastened as they extend, that the fruit may have the advantage of the sun's warmth to forward them, otherwise it will be late in the season before they are ripe, and they are unfit for use before; but when the plants are brought forward in the spring, and thus regularly trained to the south sun, the fruit will ripen by the latter end of July, and there will be a succession until the plants are killed by the frost. Some persons cultivate them for ornament, but the leaves emit so offensive an odour on being touched, as to render them very improper for a pleasure-garden; and their branches extend so widely and irregularly, especially when they are planted in good ground, that they will appear very unsightly; therefore the borders in the kitchen-garden where the plants are placed for the sake of their fruit, must not be too rich, for in a moderate soil they are less luxuriant, and more fruitful.

33. Solanum Lycopersicum; *Love-apple*, or *Tomato.* Stem unarmed, herbaceous; leaves pinnate, gashed; racemes two-parted, leafless; fruits smooth. It varies in form, size, and colour. One variety is commonly cultivated in the south of Europe, to put into soups and sauces, to which it imparts an agreeable acid flavour. The fruit of this variety is very large, compressed at both top and bottom, and deeply furrowed all over the sides, of a red or yellow colour. The other is round, about the size of a large cherry, either yellow or red. —Native of South America. It flowers from July to September, or till stopped by the frost; and the fruit ripens from the end of July till the autumnal frosts come on. The Italians and Spaniards eat it, as we do Cucumbers, with pepper, oil, and salt; and they are now much used in soups in England. For its propagation and culture, see the preceding species.

34. Solanum Pseudo-Lycopersicum; *False Tomato.* Stem unarmed, herbaceous; leaves pinnate, gashed; racemes simple; fruits subvillose; berry not grooved, less than in the preceding.—Native of St. Helena. See the thirty-second species.

35. Solanum Peruvianum; *Peruvian Nightshade.* Stem unarmed, herbaceous; leaves pinnate, gashed, tomentose; racemes two-parted, leafy; berries somewhat hairy. Root perennial; corollas bright yellow.—Native of Peru.

36. Solanum Montanum; *Mountain Nightshade.* Stem unarmed, herbaceous; leaves subcordate, repand.—Native of Peru.

37. Solanum Rubrum; *Red Nightshade.* Stem unarmed, subperennial; leaves in pairs, ovate, quite entire; peduncles subumbelled.—Native of St. Helena.

38. Solanum Nodiflorum; *Knot-flowered Nightshade.* Stem unarmed, shrubby; leaves smooth, ovate, acuminate at both ends; umbels peduncled, extrafoliaceous. This is an upright shrub, ten feet high, smooth, weak; branches round, subdichotomous, erect, knobbed at the divisions; flowers small. The Malays call it *Bret*, and cultivate it as a potherb.—Native of the island of Mauritius.

39. Solanum Nigrum; *Common* or *Garden Nightshade.* Stem unarmed, herbaceous, erect; leaves ovate, tooth-angular; racemes distich, nodding. Root annual, much branched; stem bushy, more or less angular; leaves scattered, stalked, slightly downy; umbels lateral, from the interstices of the stem between the leaves, nodding, downy, bearing a few white flowers, smelling like musk; berries globular, black when ripe, sometimes yellow. There are many varieties, in size, and in the hairiness of the leaves; but it may be always known at first sight, when it is in perfection, by the bunches of flowers or fruits hanging from the spaces between the joints of the stem and branches. There is little doubt of the herb and berries being both poisonous, though some persons have eaten them without any bad effects following. The whole herb is fetid, narcotic, and promotes perspiration and urine. From one to three grains of the leaves infused in boiling water, and taken at bed-time, occasions a copious perspiration, increases the urinary discharge, and commonly purges more or less the day following. These properties, judiciously applied, render it capable of doing very great service in several disorders; but at the same time its effects on the nervous system are so uncertain, and frequently so great, as to make the utmost caution necessary in the administration. Too large a quantity occasions violent sickness, with headache, giddiness, drowsiness, and other dangerous symptoms; and indeed its effects upon the system are so uncertain, and often so powerful, that it must always be administered with the greatest caution. The leaves, applied externally, ease pain, and abate inflammation; and the Arabians apply them to burns and ulcers. As a ridiculous application of this plant, it may be noticed, thet an ointment made of the leaves with hog's lard was used by Solano de Luque, a famous Spanish physician, to cure consumptions: the patient was to be buried for some time up to the chin in the earth, and afterwards rubbed with this ointment!—It should always be borne in mind, that the gennine properties of this plant, of the fifteenth species, (Woody Nightshade,) and of the Atropa Belladonna, are all three nearly the same.—This species is a common weed on dunghills and in gardens. All its varieties, like itself, are annual, and are propagated by sowing the seeds in spring, on a bed of rich earth, where the plants are designed to remain. When they come up, thin them to at least two feet distance. In July and August they will flower, and the seeds will ripen in autumn. A plant or two of the tenderer varieties may be set in pots and trained to sticks, to be removed into the green-house in autumn. During the winter, when the fruit is ripe, they will make a pretty appearance.

40. Solanum Ethiopicum; *Ethiopian Nightshade.* Stem unarmed, herbaceous; leaves ovate, repand, angular; peduncles fertile, one-flowered, drooping. Root annual; fruit red, large, depressed, so deeply furrowed as to be in a manner cut into lobes, hard.—Native of China, Cochin-china, and Japan, where it is cultivated for the table. This is propagated by seeds, which should be sown upon a hot-bed in the spring, and the plants afterwards treated in the same manner as has been directed for the *Capsicum;* with which treatment this plant will thrive, and produce plenty of fruit annually.

41. Solanum Melongena; *Large-fruited Nightshade,* or *Egg-plant.* Stem unarmed, herbaceous; leaves ovate, tomentose; calices armed. Herbage branched, clothed with starry, not very dense pubescence; flowers pale violet, or purplish, large, drooping; peduncles axillary, thickened, bent down, one-flowered, most commonly solitary, but not unfrequently two or three together; fruit large, egg-shaped, shining, two-celled, many-seeded, esculent. The varieties are, 1. With an oblong violet-coloured fruit. 2. With an oblong white large fruit. 3. With a globular violet-coloured fruit. 4. With a globular, white, or variegated fruit. In the first, the fruit is ovate, about the size of a swan's egg, of a dark purple on one side, and white on the other: sometimes it is white, and from that the species has obtained the name of the Egg-plant; sometimes it is yellow or pale red. In the second, the fruit is commonly eight or nine inches long, taper and straight, purplish or white. In the third, it is oblong and incurved, yellowish, and largest at the end. The fourth differs greatly from the others; the stalk and leaves being armed with very strong thorns, the leaves larger and deeply jagged on their sides, the flowers larger, and the fruit long, taper, and white. The fruit of the first is commonly eaten by the inhabitants of Asia, Africa, and America. The Spaniards cultivate it in their gardens under the name of *Barenkeena;* and the Turks, who eat it, call it *Badinjan;* the Italians name it *Melongana,* i. e. *Mala Insana* (Mad-apples); and the inhabitants of the British West Indies, *Brown John,* or *Brown Jolly.* Browne, however, says, that the Brown Jolly, or Bolangena, of Jamaica, is a rough prickly sort. The plant, he says, lives some years, and seldom rises above three or four feet in height. It was first introduced by the Jews, and bears a number of large berries, which being sliced, pickled for a few hours, and then boiled to tenderness, are used instead of greens. In the East Indies the fruit is broiled, and, being peppered and salted, is reckoned very delicious; but Dr. Russel remarks, that though Melongena is cultivated for eating in the Levant, the Insanum (the 45th species) is the kind used in the East Indies. It was cultivated by Gerarde in 1597, under the name of Mad or Raging Apple.—The different sorts or varieties are propagated by seeds sown upon a moderate hot-bed in March. When the plants come up, transplant them into another hot-bed, about four inches asunder, observing to water and shade them until they have taken root; after which give them a great share of air in warm weather. Water them frequently, and when they fill the frame, which will be by the middle or end of May, transplant them into a rich spot of ground, at two feet distance, or into the borders of the pleasure-garden, preserving a good ball of earth to the roots. Water them plentifully till they have taken root. About the middle of July the fruits will appear, and then, if the weather be dry, water the plants often, to increase the number and size of the fruit: in August it will ripen. In hot countries it is esteemed a delicacy, but is a mere curiosity in England.

42. Solanum Sabinerme; *Spear-leaved Nightshade.* Stem almost unarmed, shrubby; leaves lanceolate, elliptic, quite entire, smooth above, tomentose beneath; cymes mealy. Flowers collected into umbels, which stand erect, and come out from the side or at the end of the branches; they are of a bright blue colour, and are succeeded by round berries, which are yellow when ripe, and of the size of small black cherries.—Native of the West Indies. This, and all the following species which are natives of the same climate, or of the East Indies, must be raised from seed on a hot-bed early in the spring. When the plants are fit to remove, put each in a separate small pot filled with fresh rich earth; plunge them in a moderate hot-bed of tanners' bark, and shade them from the sun until they have taken new root; after which admit a large share of fresh air to them in warm weather, and water them frequently. Towards the end of June, harden them gradually; and soon after remove them into the stove, where they must have as much free air as possible in warm weather; but as the cold approaches in autumn they must be carefully protected, and in winter require a moderate share of warmth. Some of them will bear exposure to the open air in a warm situation, and in the height of summer; but in general it is

better to let them remain in the stove, with the glasses open in front, and daily in warm seasons to admit as much air as possible at the top of the stove.

43. Solanum Longiflorum; *Long-flowered Nightshade.* Unarmed: leaves elliptic, entire, attenuated, subtomentose beneath; racemes lateral; corollas five-parted.—Found at Cayenne.

44. Solanum Muricatum; *Warted Nightshade.* Stem almost unarmed, suffruticose, rooting; shoots warted; leaves oblong-lanceolate, entire, pubescent.—Native of Peru.

** *Prickly.*

45. Solanum Insanum; *Round-fruited Prickly Nightshade.* Stem prickly, herbaceous; leaves ovate, tomentose; peduncles pendulous, incrassated; calices prickly; fruit oblong, smooth, furrowed. This is the species which is cultivated for eating in the East Indies. One much-esteemed variety in some provinces is called *Mandia.* Swartz also observes, it has been introduced for culinary purposes in the West Indies. See the forty-first and forty-second species.

46. Solanum Torvum. Stem prickly, shrubby; prickles crooked; leaves subcordate, ovate, sinuate, tomentose; rachis prickly; calices unarmed.—Native of Jamaica, Hispaniola, and the Bermudas, in hedges.

47. Solanum Volubile; *Twining Nightshade.* Stem prickly, shrubby, scandent; leaves angular; petiole, rachis, and calix prickly; corolla larger, blue; segments long, tomentose beneath.—Found in the woods of Hispaniola and of the West Indies.

48. Solanum Ferox; *Malabar Nightshade.* Stem prickly, herbaceous; leaves cordate, angular, tomentose, prickly; berries rough-haired, covered with the calix.—Native of Malabar.

49. Solanum Campechiense; *Yellow-spined Nightshade.* Stem shrubby, prickly, rough-haired; leaves cordate-oblong, five-lobed, toothed; calices very prickly; flowers very large, of a fine blue colour; berries round, as large as in common cherries, marbled with white and green. It flowers in July and August.—Annual; sent by Houstoun from Campeachy.

50. Solanum Fuscatum; *Purple-spined Nightshade.* Stem herbaceous, prickly; leaves cordate, ovate, sinuate, lobed, with the lobes somewhat angular, the upper prickles coloured; flowers violet-coloured.—Native of America.

51. Solanum Mammosum; *Bachelor's Pear.* Stem herbaceous; leaves cordate, angular-lobed, villose and prickly on both sides; fruit pointed. An annual stove plant: herbage very villose; the footstalks and ribs of the leaves armed with straight yellow thorns. The flowers are produced in bunches from the side of the stalks; they are of a pale blue colour, and are succeeded by yellow fruit, of the shape and size of a Catharine Pear inverted.—It doth not however appear, why this fruit, which grows commonly all over the West Indies, has there universally obtained the name of Bachelor's Pear, except it be, as we shrewdly suspect, not edible, and thence so named, to insinuate that it is good for nothing. Merian says, it is very poisonous to men and beasts.

52. Solanum Hirtum; *Rough-haired Nightshade.* Shrubby, prickly: leaves cordate, angular, tomentose, prickly; peduncles lateral, aggregate, with the calices very hirsute.—Native of the island of Trinidad.

53. Solanum Paniculatum; *Panicled Nightshade.* Stem and petioles prickly; leaves sinuate-angular, smooth above; flowers panicled.—Native of Brazil.

54. Solanum Aculeatissimum; *Prickly Nightshade.* Stem shrubby, very prickly; leaves cordate, five-lobed and sinuate, somewhat hairy; calices prickly.—Native of America.

55. Solanum Virginianum; *Virginian Nightshade.* Stem erect, prickly; leaves pinnatifid, prickly all over; segments sinuate, obtuse, ciliate at the edge; calices prickly. Annual. Flowers large and blue; berries the size of black cherries, variegated with green and white.—Native of America.

56. Solanum Jacquini; *Jacquin's Nightshade.* Stem decumbent, diffused, prickly; leaves pinnatifid, prickly all over; segments sinuate, obtuse, naked at the edge; calices prickly; fruit globose, the size of a gooseberry, variegated with light green. It varies with the segments of the leaves scarcely sinuate. Annual.—Native of the East Indies.

57. Solanum Xanthocarpum; *Yellow-fruited Nightshade.* Stem decumbent, diffused, prickly; leaves pinnatifid, prickly, stellate, pubescent; segments sinuate, acute, naked at the edge; calices prickly. Annual.—Native of the Cape.

58. Solanum Coagulans. Stem prickly, shrubby; leaves oblong, repand-sinuate, tomentose, prickly; lobes rounded, entire.—Native of Arabia Felix.

59. Solanum Jamaicense; *Jamaica Nightshade.* Stem prickly, shrubby; leaves wedged, wider in the middle, obtuse-angled, tomentose on both sides; rachises and calices prickly; prickles bent back; berry roundish, first green, veined with black, but wholly black when ripe, smooth, having a dot at the top, size of a red currant.—Native of Jamaica and Hispaniola, in waste places.

60. Solanum Indium; *Indian Nightshade.* Stem prickly, shrubby; leaves wedge-shaped, angular, subvillose, quite entire; prickles straight; berries round, of a gold colour, as large as cherries.—Native of both Indies, and of Cochin-china.

61. Solanum Carolinense; *Carolina Nightshade.* Stem prickly, annual; leaves hastate, angular; prickles straight; racemes loose.—Native of Carolina.

62. Solanum Sinuatum; *Sinuate-leaved Nightshade.* Stem shrubby, round, prickly; leaves bipinnatifid, sinuate, villose, prickly on both sides; calices villose, prickly; corolla yellow; berry the size of a cherry.—Native place not stated.

63. Solanum Sodomeum; *Black-spined Nightshade.* Stem prickly, shrubby, round; leaves pinnatifid sinuate, sparsedly prickly, naked; calices prickly. The flowers come out in small bunches on the side of the branches; they are blue, appear in June and July, and are succeeded by round yellow berries, as large as walnuts.—Native of Africa and the south of Europe.

64. Solanum Capense; *Cape Nightshade.* Stem prickly, shrubby, round; leaves sinuate, pinnated, prickly, naked; segments alternate, entire, obtuse.—Native of the Cape.

65. Solanum Marginatum; *White Nightshade.* Prickly: leaves cordate, repand, with a white edge; flowers racemed, bell-shaped, plaited, tomentose, white like those of the Common Potato; fruit ovate, of a dirty yellow. It flowers most part of the summer.—Native of Abyssinia, where it was found by the celebrated traveller Bruce.

66. Solanum Stramonifolium; *Broad-leaved Nightshade.* Stem prickly, shrubby; leaves cordate, angular lobed, entire, almost unarmed, somewhat tomentose beneath. It flowers from June to September.—Native of both Indies.

67. Solanum Vespertilio; *Canary Nightshade.* Stem prickly, shrubby; leaves cordate, entire; corollas somewhat irregular; lower anthera more produced. It flowers here in March and April.—Native of the Canary Islands.

68. Solanum Sanctum; *Palestine Nightshade.* Stem prickly, shrubby; prickles tomentose; leaves obliquely ovate, repand; corolla like that of Borage, purplish blue.—Native of Palestine; whence the trivial name Sanctum.

69. Solanum Hybridum; *Mule Nightshade.* Stem prickly, shrubby; leaves ovate, almost unarmed, acute, repand, when

young having a violet-coloured meal on the back and at the edge; corolla pale blue, wrinkled, with a white border divided to the middle into five, six, or ten parts.—Native of Guinea.

70. Solanum Tomentosum; *Woolly Nightshade.* Stem prickly, shrubby; prickles acerose; leaves cordate, unarmed, subrepand, when young having a purple meal on them. The flowers are produced in small, loose, axillary bunches; they are blue and large, appearing in June and July, and are succeeded by round berries as large as common cherries, of a gold colour, but turning black when ripe. There is a variety which differs only in having whitish flowers, and smaller fruit of a scarlet colour.—Native of the Cape.

71. Solanum Polygamum; *Polygamous Nightshade.* Stem, petioles, and leaves, prickly; leaves ovate-oblong, mostly entire, somewhat rugged above, tomentose beneath.—Native of the island of Santa Cruz.

72. Solanum Bahamense; *Bahama Nightshade.* Stem prickly, shrubby; leaves lanceolate, repand, obtuse, bent back at the edge; racemes simple; flowers in long bunches from the side of the stalk, of a fine violet colour; berries saffron-coloured, the size of peas.—Native of Jamaica, and of Providence, one of the Bahama islands.

73. Solanum Obscurum; *Obscure Nightshade.* Leaves elliptic-lanceolate, flat, villose beneath; racemes lateral; stem and petioles prickly; branches purple, smooth at bottom; corollas villose on the outside.—Native of Cayenne.

74. Solanum Giganteum; *Tall Nightshade.* Stem prickly, shrubby; prickles tomentose; leaves lanceolate, acute, unarmed, smooth above, snow-white and hoary beneath; racemes dichotomous, cymed, terminating. A shrub of a tall and striking habit, flowering in June and July. Branches thick and round; prickles copious, short; leaves numerous about the tops of the branches, three to five inches long, dark green above, soft and white beneath; flowers numerous, small, purple, drooping.—Native of the Cape.

75. Solanum Flexuosum; *Waving-branched Nightshade.* Leaves geminate, elliptic-lanceolate, somewhat rugged, entire underneath, with the petioles prickly; flowers four-stamined. This is very nearly allied to the seventy-third species, which has also geminate leaves; but differs in having the branches more rigid and flexuose, the leaves larger and more attenuated, the prickles more frequent on the petioles, and four stamina; corolla deeply four-cleft.—Native of Cayenne.

76. Solanum Lanceæfolium; *Lance-leaved Nightshade.* Stem shrubby, scandent, prickly; leaves geminate, oblong, attenuated to both ends, somewhat rugged, prickly beneath; flowers five-stamined.—Native of South America.

77. Solanum Lanceolatum; *Lanceolate Nightshade.* Stem shrubby, tomentose, prickly; leaves narrow, lanceolate, quite entire, tomentose beneath, unarmed; panicle terminating; flowers blue, large.—Native of Mexico.

78. Solanum Eleagnifolium. Stem shrubby; petioles and leaves lanceolate, obtuse, tomentose beneath, subaculeate; racemes lateral.—Native of South America.

79. Solanum Polyacanthos; *Many-thorned Nightshade.* Very prickly: leaves linear-lanceolate, subrepand, subsessile, obtuse; peduncles axillary, one-flowered. Flowers very small, white, drooping; prickles like needles; berries globular, smooth, shining, the size of a Coriander seed.—Native of Dominica.

80. Solanum Igneum; *Red-spined Nightshade.* Stem prickly, shrubby; leaves lanceolate, acuminate, rolled back at the base on both sides; racemes simple; flowers in long bunches from the side of the stalks, white, and succeeded by red berries, almost as large as the small black cherry. It very much resembles the seventy-second species; but the flowers in that are violet, in this white. The leaves of this also are acuminate, not bluntish; the spines stouter, more abundant, and of a fiery red colour. It flowers from March to November.—Native of South America.

81. Solanum Milleri; *Miller's Nightshade.* Stem shrubby, prickly; leaves smooth, pinnatifid, with about five lobes, quite entire, prickly; peduncles one-flowered, subgeminate. This is distinguished from the next species, by its pinnatifid leaves, much smaller white flowers, and other marks. The flowers are in long bunches from the side of the stalks; and are succeeded by red berries. Perennial.—Native of the Cape.

82. Solanum Trilobatum; *Three-lobed Nightshade.* Stem prickly, shrubby; leaves wedge-form, angular, subtrilobate, obtuse, smooth; flowers large, violet-coloured; berries small like those of Elder.—Probably a native of both Indies.

83. Solanum Heterandrum. Stem aculeate, annual; leaves bipinnatifid, rough, tomentose and aculeate on both sides; segments somewhat obtuse; racemes lateral; anthers patulous, corniform; berry subquadrilocular, included in the echinated calix; flowers large, yellow. This curious plant was discovered by Mr. T. Nuttall, on the banks of the Missouri. Pursh observes, that it is very nearly allied to Solanum Cornutum; and surmises that these two plants, together with some others not yet fully examined, will probably be constituted a distinct genus by some future botanist.

84. Solanum Lycioides. Stem shrubby, thorny; leaves elliptic; flowers lateral, solitary.—Native of Peru.

85. Solanum Biflorum; *Two-flowered Nightshade.* Stem unarmed, shrubby; leaves ovate, villose; peduncles in pairs.—Native of China and Cochin-china.

86. Solanum Album; *White Nightshade.* Stem unarmed, suffruticose; branches prostrate; leaves oblong, angular; peduncles many-flowered; flowers lateral, white; berries middle-sized, globular, green, spotted with white, esculent. The root is reckoned good in the toothache.—Native of Amboyna and China.

87. Solanum Dichotomum. Stem unarmed, suffruticose; leaves cordate-lanceolate; peduncles dichotomous.—Native of China; found near Canton.

88. Solanum Procumbens. Stem prickly, suffruticose, procumbent; flowers heaped, terminating; corolla wheel-shaped, four-parted; berry very small, round, deep-red, shining, many-seeded.—Native of Cochin-china.

89. Solanum Angustifolium; *Narrow-leaved Nightshade.* Stem prickly, shrubby; leaves pinnate-laciniate, tomentose, prickly on both sides; peduncles axillary, two-flowered.—Found at Vera Cruz, in New Spain.

90. Solanum Quercifolium; *Oak-leaved Nightshade.* Stem prickly, shrubby; leaves oblong, sinuate-pinnate, prickly; umbels sessile. The flowers come out in small loose bunches by the side of the branches, to which they sit close; they are small and white; the berries are about the size of those of Juniper, and are red when ripe.—Found at Vera Cruz.

91. Solanum Scandens; *Twining Nightshade.* Stem unarmed, frutescent, flexuose; leaves ovate, tomentose beneath; flowers solitary, axillary, they are large, of a fine blue colour, not divided into segments, but having fine angles, each ending in a point; berries round, red when ripe, size of peas.—Found at Vera Cruz.

92. Solanum Houstoni; *Houstoun's Nightshade.* Stem prickly, shrubby; leaves ovate, sinuate-toothed, tomentose beneath; prickles every way straight; umbels sessile, terminating. The flowers are produced in large umbels, at the ends of the branches, they are large, of a fine blue colour, in woody calices; berries round, the size of large peas when ripe.—Found at La Vera Cruz.

SOLANUM INERME.

SOLANUM HETERANDRUM. *American Horned Nightshade.*

G. Doble sc.

Published by Fisher, Son & Cº Caxton, London. 1828.

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93. Solanum Umbellatum. Stem frutescent, unarmed; leaves lanceolate, quite entire, hairy underneath; umbels erect, terminating; flowers small, star-pointed, and white; berries size of peas, yellow when ripe.—Found at Campeachy.

94. Solanum Racemosum. Stem unarmed, shrubby; leaves ovate, quite entire, tomentose underneath; umbels erect, terminating; calices obtuse, lanuginous; flowers large and white; berries round, the size of small cherries, turning yellow when ripe.—Native of Carthagena in New Spain.

95. Solanum Inerme. Leaves smooth on both sides; stalk taper and smooth, from two to three feet high, sending out irregular branches on every side; flowers coming from the wings of the stalks; they are five, large, blue-coloured, appearing in June, and continuing in succession till winter. —Native of India; it can only be preserved here in a stove.

96. Solanum Stelligerum; *Starry Nightshade.* Stem shrubby, prickly, with taper thorns; leaves lanceolate, entire, unarmed, smooth above, densely woolly and veiny beneath; wool starry; corymbs lateral. A bushy shrub, three to five feet high, with round, downy, leafy branches; flowers light blue; berries scarlet, erect, the size of currants.—Native of New South Wales.

Soldanella; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, straight, permanent; segments lanceolate. *Corolla:* one-petalled, bell-shaped, widening gradually, straight; mouth torn into many-cleft acute segments. *Stamina:* filamenta five, awl-shaped; antheræ simple, sagittate. *Pistil:* germen roundish; style filiform, length of the corolla, permanent; stigma simple. *Pericarp:* capsule oblong, round, obliquely striated, one-celled, opening by a many-toothed top. *Seeds:* numerous, acuminate, very small; receptacle columnar, free. Essential Character. *Corolla:* bell-shaped, lacerotifid. *Capsule:* one-celled, many-toothed at the top.——The only known species is,

1. Soldanella Alpina; *Alpine Soldanella.* Root fibrous; stem none; leaves almost kidney-shaped, about three-quarters of an inch over each way, of a dark-green colour, on long footstalks; among these arises a naked flower-stalk or scape, about four inches long, sustaining at the top two small, open, bell-shaped flowers, with the brim cut into many fine segments like a fringe. The most common colour is blue, but it is sometimes snow-white. It flowers in April, and ripens seed in July.—Native of the alps of Austria and Switzerland, and of the Pyrenean mountains. Seeds that ripen in England may be sown in a box or pot soon after they are ripe, placed in the shade, and frequently watered in dry weather. The plants will sometimes appear in autumn, but generally not till the following spring. When they appear, water them in dry weather, and keep them constantly in the shade. Transplant them in the following autumn, into a shady border, six or eight inches asunder, or rather into small pots. Or, part the roots in September: if they be removed in spring, the plants never flower strong; and if the season should prove dry, they will decay, unless they are constantly supplied with water.—Like most other alpine plants, it requires shade and moisture in the summer, and thrives best in a pot, set in a northern aspect: in winter it requires the shelter of a frame, in lieu of snow, its natural covering.

Soldier Wood. See *Mimosa Purpurea.*

Solidago; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common oblong, imbricate; scales oblong, narrow, acuminate, straight, converging. *Corolla:* compound radiate; corollets hermaphrodite, tubular, very many in the disk; female ligulate, fewer than ten, generally five in the ray: proper of the hermaphrodite funnel-form, with a five-cleft patulous border: female ligulate, lanceolate, three-toothed. *Stamina:* in the hermaphrodites; filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* in the hermaphrodites; germen oblong; style filiform, length of the stamina; stigma bifid, spreading: in the female; germen oblong; style filiform, length of the hermaphrodite; stigmas two, revolute. *Pericarp:* none, the calix scarcely changed. *Seeds:* in the hermaphrodites, solitary, obovate-oblong. *Down:* capillary; in the females, very like the others. *Receptacle:* flattish, naked. Essential Character. *Calix:* scales imbricate, closed. *Corollets of the ray:* about five. *Down:* simple. *Receptacle:* naked.——The species are,

* *With Racemes directed one way.*

1. Solidago Canadensis; *Canadian Golden Rod.* Stem villose, erect; leaves lanceolate, serrate, triple-nerved, rugged; racemes panicled, directed one way, recurved; ligules abbreviated. Stem angular, from eighteen inches to five feet high, terminated by an ample downy panicle of innumerable very small yellow flowers. There are several varieties. —Grows in hedges, old fields, and along fences, from Canada to Pennsylvania, flowering from July to September. ——Many of the plants of this genus are great ornaments to the English gardens at the end of summer, when there is a scarcity of other flowers; which renders these more valuable. The European species are seldom admitted into gardens, as they do not make any great appearance; but those from North America are more esteemed. They may easily be propagated by parting their roots, the best time for doing which is in autumn, as soon as their flowers are past; but those which do not flower till very late in the year, should be transplanted early in the spring, before they begin to shoot, and the roots may then be parted; and if the spring should turn out dry, they will require water to establish them well in the ground, otherwise they will not flower well in the succeeding autumn. Some of the sorts spread their roots, and propagate much faster than others; such may be transplanted and parted every other year; or, if the plants be wanted, they may be every year divided, but in that case they cannot flower so strongly as those which may be suffered to remain longer unremoved. Those species, the roots of which do not multiply so fast, should be parted only once in three years, if they be expected to flower strong. Those which are tall plants are not very proper furniture for small gardens, because they require much room; for these should be allowed four or five feet, otherwise their roots will intermix with those of the neighbouring plants, and draw away their nourishment; therefore these plants are proper ornaments for large extended walks round fields, or for the borders of wood-walks, where they will make a fine appearance during their season of flowering; they will thrive in almost any soil, but will grow much larger, and make a better appearance, in good ground. They may also be propagated by seeds, but it is only the early flowering kinds which perfect their seeds in England. The seeds should be sown in autumn, soon after they are ripe, for those which are kept out of the ground till spring seldom succeed, or, at best, do not come up the same year; they may be sown in drills, upon a bed of fresh earth, at about a foot asunder, but the seeds should be scattered pretty thick in the drills, and covered lightly over with fine earth. When the plants come up, they must be kept clean from weeds, and where they are too close, part of them may be drawn out, and planted in a shady border, to allow room for the others to grow till autumn, when they should be transplanted where they are intended to remain. In the following year they will flower, and their roots will last for many years.

2. Solidago Procera; *Great Golden Rod.* Stem villose, upright; leaves lanceolate, serrate, triple-nerved, rugged, villose underneath; racemes spike-shaped, erect, before they open nodding; ligules abbreviated. Flowers small, brimstone-coloured, appearing in September, and generally continuing till October. From four to seven feet high.—Grows in swamps, hedges, and about fences, from Canada to Virginia.

3. Solidago Serotina; *Upright Smooth Golden Rod.* Stem upright, round, even; leaves linear-lanceolate, smooth, rough at the edge, serrate, triple-nerved; racemes panicled, directed one way.—Found from New England to Pennsylvania.

4. Solidago Gigantea; *Gigantic Golden Rod.* Stem upright, smooth; leaves lanceolate, smooth, serrate, rugged at the edge; racemes panicled, directed one way; peduncles rough-haired; ligules abbreviated.—Found in open low places, on the sides of fertile hills, from New England to Virginia.

5. Solidago Reflexa; *Reflexed Golden Rod.* Stem upright, villose; leaves lanceolate, subserrate, triple-nerved, rugged, reflexed; racemes panicled, directed mostly one way.—Found in Pine woods and old fields from New Jersey to Carolina, flowering in August and September.

6. Solidago Lateriflora; *Lateral-flowered Golden Rod.* Stem upright, somewhat hairy; leaves lanceolate, subtriple-nerved, smooth, except at the edge, which is rugged, the lower ones subserrate; racemes panicled, subrecurved, directed one way. The upper part of the stalk branches out into a panicle, and these branches have long spikes of flowers coming out from the wings, which are recurved, and of a bright yellow colour: they appear in the beginning of August, and, if the autumn proves favourable, will ripen at the end of September.—Native of New Jersey.

7. Solidago Aspera; *Rough-leaved Golden Rod.* Stem upright, round, hairy; leaves ovate, subelliptic, very rugged, wrinkled, serrate, nerveless; racemes panicled, directed but one way. At a foot or a foot and half from the top, the stem puts out branches, which are very full of small flowers on spikes, a little reflexed. It flowers here in September.—Native of Virginia and Carolina.

8. Solidago Altissima; *Tall Golden Rod.* Stem upright, rough-haired; leaves lanceolate, very rugged, wrinkled, serrate, nerveless; panicles directed one way; flowers very many on the upper branches, in long rod-like spikes, somewhat reflexed, having four, five, and six florets in the ray. They appear in August and September.—There are several varieties, all natives of North America.

9. Solidago Nemoralis; *Woody-stalked Golden Rod.* Stem upright, tomentose; stem-leaves lanceolate, hispid, quite entire; root-leaves subcuneiform, serrate; racemes panicled, directed one way. It flowers in September.—Native of North America.

10. Solidago Arguta; *Sharp-notched Golden Rod.* Stem upright, smooth; leaves smooth, sharply and unequally serrate; stem-leaves elliptic; root-leaves ovate-oblong; racemes panicled, directed one way; ligules elongated.—Native of North America.

11. Solidago Juncea; *Rush-stalked Golden Rod.* Stem upright, smooth; leaves lanceolate, smooth, rugged at the edge, the lower ones serrate; racemes panicled, directed one way. It flowers in August and September.—Native of North America.

12. Solidago Elliptica; *Oval-leaved Golden Rod.* Stem upright, smooth; leaves elliptic, even, serrate; racemes panicled, directed one way; ligules middling; flowers from the upper axils in short, erect, obtuse spikes, of a pale yellow colour, and appearing in August.—Native of Canada.

13. Solidago Sempervirens; *Narrow-leaved Evergreen Golden Rod.* Stem upright, smooth; leaves linear-lanceolate, somewhat fleshy, even, quite entire, rugged at the edge; racemes panicled, directed one way; peduncles hairy. The flowers are of a bright yellow, disposed in a loose panicle at the top of the stalk, and appear here from October to December.—Native of North America.

14. Solidago Odora; *Sweet-scented Golden Rod.* Stem upright, pubescent; leaves linear-lanceolate, quite entire, smooth, rugged at the edge; racemes panicled, directed one way. It flowers in July and August.—Native of the Alleghany mountains; and used by the inhabitants as an agreeable substitute for Tea.

15. Solidago Villosa. Stem erect, villous; leaves lanceolate, serrate, enerved; racemes paniculate, fruitful.—Grows from eighteen inches to three feet high, and is frequent in the fields and woods of North America.

16. Solidago Pyramidata. Stem erect, cylindrical, hairy; leaves oblong, acute, subamplexicaul-sessile; panicles naked, fruitful, pyramidal; branches reflex; peduncles glabrous. Grows to the height of about two feet; the leaves decrease toward the beginning of the panicle, which consists of lively yellow and very small flowers.—It is found in the pine-barrens of Georgia.

17. Solidago Asperata. Stem paniculate-corymbose; racemes suberect; flowers ascending; leaves lanceolate, serrate, scabrous.—Grows in Canada.

18. Solidago Virgata. Stem glabrous, very simple; leaves subcuneate-lanceolate, obtuse, very entire, very glabrous; peduncles glabrous, fruitful.—An extremely smooth and slender plant, about two feet high, growing in the shady wet woods of Lower Carolina and Georgia.

19. Solidago Retrorsa. Stem erect, cylindrical, rough; leaves sessile, reflex, linear-lanceolate, mucronate; panicles with recurved racemes.—Grows in the open swamps of Virginia and Carolina.

** *With upright Racemes.*

20. Solidago Lanceolata; *Grass-leaved Golden Rod.* Stem smooth, very much branched; leaves linear-lanceolate, quite entire, three-nerved, smooth; corymbs terminating; ligules the height of the disk; flowers bright yellow, appearing in August.—Found from Canada to Pennsylvania.

21. Solidago Lævigata; *Fleshy-leaved Golden Rod.* Stem upright, even; leaves lanceolate, fleshy, quite entire, even all over; racemes panicled, upright; peduncles scaly, villose; ligules elongated. This seldom shews its flowers till late in October, so that unless the autumn proves favourable, the stalks are pinched by the frost before the flowers blow. The seeds seldom ripen in England unless the plants be sheltered.—Native of North America, imported from Canada.

22. Solidago Mexicana; *Mexican Golden Rod.* Stem oblique, smooth; leaves lanceolate, somewhat fleshy, quite entire, even all over; racemes panicled, upright; peduncles scaly, smooth; ligules elongated; flowers appearing at the end of August.—Native of North America.

23. Solidago Viminea; *Twiggy Golden Rod.* Stem upright, subpubescent; leaves linear-lanceolate, membranaceous, attenuated at the base, smooth, except at the edge, which is rugged, the lowest subserrate; racemes upright; ligules elongated. Flowers large, bright yellow, appearing in September.—Native of North America.

24. Solidago Stricta; *Willow-leaved Golden Rod.* Stem upright, smooth; stem-leaves lanceolate, quite entire, smooth, rugged at the edge; root-leaves serrate; racemes panicled, upright; peduncles smooth. It flowers in September.—Native of North America, in sandy woods.

25. Solidago Petiolaris; *Late-flowering Golden Rod.* Stem upright, villose; leaves elliptic, somewhat rugged, petioled; racemes upright; ligules elongated.—It flowers from October to December, and is a native of North America.

26. Solidago Bicolor; *Two-coloured Golden Rod.* Stem and leaves hairy; leaves elliptic, the lower ones serrate; the branches have smaller leaves on them; racemes upright; calix-scales blunt. The flowers, which appear in September, are in close racemes, with a white ray and a yellow disk.—Native of North America.

27. Solidago Rigida; *Hard-leaved Golden Rod.* Stem and leaves ovate-oblong, hairy, rugged; stem-leaves quite entire, the lowest serrate; flowering branches panicled; racemes compact, upright; ligules elongated. The flowers are in short, clustered, roundish spikes, bright yellow, appearing in August.—Native of New England.

28. Solidago Cæsia; *Maryland Golden Rod.* Stem even, straight; leaves lanceolate, serrate, smooth; racemes upright; ligules middling. Flowers in a loose terminating panicle, with the spikes thicker and closer towards the top: they appear in September.—Native of Maryland.

29. Solidago Flexicaulis; *Crooked-stalked Golden Rod.* Stem flexuose, smooth, angular; leaves ovate, acuminate, serrate, smooth; racemes upright; ligules middling. The flowers are produced in short bunches from the axils almost the whole length; the lower spikes are an inch long, but the upper ones are almost round: they are brimstone-coloured, and appear late in the season.—Native of Canada, and other parts of North America.

30. Solidago Ambigua; *Angular-stalked Golden Rod.* Stem subflexuose, smooth, angular, branched; leaves oblong-lanceolate, closely serrate, somewhat hairy underneath; racemes upright; ligules elongated. Flowers in long bunches from the axils, disposed loosely, of a pale yellow colour, appearing in August, and continuing part of September.—Native place unknown.

31. Solidago Virgaurea; *Common Golden Rod, Woundwort,* or *Aaron's Rod.* Stem somewhat flexuose, pubescent, angular; leaves serrate, somewhat hairy; racemes panicled, erect, clustered; ligules elongated. Root perennial, consisting of long simple fibres; height of the stem very various, from ten inches to three feet; flowers in terminating, axillary, erect clusters or corymbs, forming a dense, leafy, pubescent panicle, which varies extremely as to luxuriance and the number of flowers, in a barren soil and on mountains being shorter, more dense, and less compound; corolla of a gold colour. This plant has been suspected to be different from that described under the same name by Linneus; but Dr. Smith, whose authority is decisive, declares, that on a careful comparison of specimens they are found to be precisely the same. The herb, when bruised, smells like Wild Carrot. The root, dried and powdered, is a good medicine for violent purgings, excessive menstrual discharges, bloody stools, and all other fluxes and hæmorrhages. An infusion of the whole plant taken inwardly is an excellent medicine for wounds, bruises, spitting of blood, &c. A case is related in the *Gentleman's Magazine* for February 1788, of the efficacy of a decoction of this plant in the stone. A boy, ten or eleven years of age, after taking a decoction or infusion of the Golden Rod for some months at times, voided great quantities of gravel, with many small stones; and after that, fifteen large stones, from three-fourths of an ounce to an ounce and a quarter; besides fifty or more, not less than a large pea.—There are many varieties of this species; as, the Narrow-leaved Golden Rod; the Dwarf Golden Rod; and the Welsh Golden Rod, which last is a well marked variety, distinguished by its very simple pubescent stem, wedge-lanceolate, serrate, and somewhat hairy leaves, upright racemes, and elongated ligules. This has been found near Llanberys and on Llyn y Cyn, near Snowden in Wales; also on the mountains of Yorkshire and Westmoreland, and the Highlands of Scotland.—The Common Golden Rod is a native of bushy, heathy, mountainous, and alpine situations throughout Europe, flowering at the end of summer.

32. Solidago Multiradiata; *Labrador Golden Rod.* Stem somewhat villose; leaves sessile, lanceolate, smooth, ciliate, the lower ones serrate at the top; raceme terminating, upright; ligules elongated, numerous. It flowers in July.—Native of Labrador.

33. Solidago Minuta; *Least Golden Rod.* Stem quite simple, hairy; leaves lanceolate-acute, serrate, smooth; raceme terminating, simple, upright; ligules elongated. It flowers in July.—Common in the Alps and Pyrenees.

34. Solidago Urticifolia; *Nettle-leaved Golden Rod.* Stem round, hairy; leaves ovate-lanceolate, crenate, opposite, rugged; racemes very short, lateral; flowers in short bunches from the upper axils, deep yellow, and rather large.—Native of La Vera Cruz in New Spain. This, and the next species, being natives of a warm climate, will not thrive here, except assisted by artificial heat in winter, especially the latter, which requires a warmer situation than the other. They should be planted in pots, and then treated in the same way as other tender plants from the same country. This may be propagated by cuttings, planted in pots filled with loamy earth, and plunged into a moderate hot-bed.

35. Solidago Fruticosa; *Shrubby Golden Rod.* Stem shrubby; leaves lanceolate, smooth, quite entire; flowers corymbed, terminating, of a pale yellow colour, upon pretty long peduncles. The common calix is cut almost to the bottom.—Native of La Vera Cruz in New Spain. This is propagated by parting the roots, in the same manner as the sorts before mentioned under the first species.

36. Solidago Pauciflosculosa. Plant glabrous, suffruticose; leaves lanceolate, obtuse, enerved; panicles compound, many-flowered; fascicles erect; calices narrow-oblong, five-flowered; ray single.—Grows in the sand-barrens of Virginia and Carolina.

37. Solidago Sarothræ. Stem angular, scabrous, the lower part naked, the upper part corymbose; branches with few flowers at the summits; leaves linear; axils naked; ligules longer than twice the disk.—Found by Mr. Lewis on the plains of the Missouri.

38. Solidago Erecta. Stem subvillose; leaves lanceolate, venous, glabrous, very entire, subpetiolate.—A North American plant.

39. Solidago Macrophylla. Lower leaves ovate, acuminate; stem-leaves lanceolate, subsessile, serrate; racemes axillary, peduncled, leafy; calices oblong, turgid, many-flowered; ligules subelongate. This is about three feet high; and is intermediate between this genus and *Aster.*—Grows in Canada.

40. Solidago Glomerata. Stem low, very simple; leaves glabrous, oblong-lanceolate, serrate; raceme simple; calices turgid, many-flowered.—Grows on the mountains of Carolina.

41. Solidago Axillaris. Stem glabrous, cylindrical, very upright; leaves lanceolate, serrate, glabrous; racemes axillary, subglobose, erect; ligules elongate.—Grows in shady woods from Canada to Virginia.

42. Solidago Humilis. Stem simple, erect, glabrous; leaves lanceolate, serrate, glabrous, elongate; raceme erect.—Grows in North America.

Solomon's Seal. See *Convallaria.*

Sonchus; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common imbricate, ventricose; scales very many, linear, unequal. *Corolla:* compound imbricate, uniform; corollets hermaphrodite, numerous, equal; proper one-petalled, ligulate, linear, truncate, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* germen subovate: style filiform, length of the stamina; stigmas two, reflexed. *Pericarp:* none; the calix converging into a depressed acuminate globe. *Seeds:* solitary, oblongish. *Down:* capillary, sessile. *Receptacle:* naked. Essential Character. *Calix:* imbricate, ventricose. *Down:* hairy. *Receptacle:* naked.—Many of the species are weeds, and therefore not to be planted in gardens, but extirpated continually, not only in the garden itself, but in all the parts near it, their winged seeds being wafted to a considerable distance. The foreign sorts may be propagated by seeds, and those which are shrubby by cuttings.——The species are,

1. Sonchus Maritimus; *Sea Sow-Thistle.* Peduncle naked; leaves lanceolate, embracing, undivided, sharply toothed backwards. It flowers from July to September.—Native of the south of Europe, and of Barbary, in sandy wet places.

2. Sonchus Cœruleus; *Blue Sow-Thistle.* Peduncles and calices hispid and racemed; leaves sublyrate, terminating; lobe deltoid and very large. Root perennial, fleshy, branched, in tufts; corolla blue purple, twice as long as the calix.—Native of Canada and the European Alps. Found also on the borders of corn-fields about Willington and Howden Pans in Northumberland.

3. Sonchus Palustris; *Marsh Sow-Thistle.* Peduncles and calices hispid, subumbelled; leaves runcinate, sagittate at the base, rugged at the edge. Root perennial, fleshy, branched, but not creeping; panicle composed of several yellow flowers. When old, it forms a large stool, and throws out numerous stems from four to seven feet in height. This is the tallest of our English herbaceous plants. It flowers in July and August, three weeks later than the next species, which it nearly resembles.—Native of Germany, Flanders, France, Italy, Hungary, Denmark, and England. Found on the banks of the Thames, not far from Greenwich; sparingly in the marshes about Blackwall and Poplar; also between Greenwich and Woolwich.

4. Sonchus Arvensis; *Corn Sow-Thistle.* Peduncles and calices hispid, subumbelled; leaves runcinate, toothletted, cordate at the base. Root creeping, perennial, milky, composed of oblong fleshy branches, which render it very difficult to be extirpated; stem three or four feet high, nearly simple; flowers very large and conspicuous, of a bright gold colour, externally reddish. Mr. Curtis observes, that this is properly named *Arvensis,* being commonly found in corn-fields, where its large yellow flowers towering above the corn, render it a very conspicuous plant. Its size, creeping root, and numerous globular hairs on the calices and peduncles, sufficiently distinguish it from the sixth species. Cows and goats are said to eat the plant, of which horses also are very fond.—The leaves, like those of the Common Sow-Thistle, applied outwardly by way of cataplasm, have been found serviceable in inflammatory swellings.

5. Sonchus Agrestis. Peduncles tomentose, many-flowered; calices smooth; stem striated; leaves gash-serrate, sessile. Flowers yellowish-white. Annual.—Native of Jamaica.

6. Sonchus Oleraceus; *Common Sow-Thistle.* Peduncles tomentose; calices even; leaves runcinate, toothed. Root annual, fusiform, whitish, milky; stem from one to three feet high, upright, branched, especially towards the top, round, except near the top, where it is somewhat angular, smooth, tender, brittle, hollow, leafy, sometimes purplish. This plant is subject to great variations, which are merely owing to soil and situation; even the prickly one may be readily traced into the smooth in gardens overrun with these plants. It appears to have nearly the same properties as Dandelion and Succory, but is little regarded as a medicine. It is a favourite food with hares and rabbits; and is eaten by goats, hogs, and sheep, but disliked by horses. In some countries the young tender leaves are boiled and eaten as greens; and it is even asserted that the tender shoots of the smooth variety, boiled like Spinach, are superior to any greens not in common use.—It abounds in most gardens, and is often met with on walls, being more injurious to the slovenly gardener than the husbandman. It flowers chiefly in July, August, and September.

7. Sonchus Tenerrimus; *Clammy Sow-Thistle.* Peduncles tomentose; calices hairy. Root annual; stem very much branched, with scattered glutinous hairs on it; flowers yellow, corymbed. It varies greatly, and is distinguished from the other species by the very tender pinnatifid leaflets, and the tomentose base of the calix. It flowers perpetually; and is eaten by the common people as a salad.—Native of Italy and the south of France. Found also in Barbary, both in corn-fields and on the sea-shore.

8. Sonchus Plumieri; *Plumier's Sow-Thistle.* Peduncles naked; flowers panicled; leaves runcinate. This very much resembles the next species, but the corolla has only one row of florets, or are fewer by half than that, but four times as big; stem the height of a man; corollas blue.—Native of the Pyrenees.

9. Sonchus Alpinus; *Alpine Sow-Thistle.* Peduncles scaly; flowers racemed; leaves runcinate. Root annual; stem simple, upright, round, striated, glaucous, the height of a man and upwards; corolla blue. This has been much confounded with the second species, from which it is totally different.—Found on the sides of hills, and in valleys, among the Lapland alps; where the natives eat the stalks raw like Angelica, stripping off the bark; but Linneus, who there discovered it, found them too bitter for his palate.

10. Sonchus Fruticosus; *Shrubby Sow-Thistle.* Peduncles somewhat scaly; leaves attenuated at the base, and lyrate; lobes rounded, obtuse; flowering calices squarrose. Stem shrubby, smooth, milky, upright, scarcely branched, round, thick, gray.—Native of Teneriffe and Madeira.

11. Sonchus Pinnatus; *Wing-leaved Sow-Thistle.* Peduncles naked; calices even; leaves pinnate; pinnas linear-lanceolate, somewhat toothed.—Native of Madeira.

12. Sonchus Radicatus; *Long-rooted Sow-Thistle.* Peduncles naked, together with the calices smooth; stem almost naked; root-leaves lyrate, even on both sides; lobes triangular, ovate.—Native of the Canaries.

13. Sonchus Floridanus; *Small-flowered Sow-Thistle.* Peduncles scaly; leaves lyrate-hastate. Stem annual, four feet high; flowers yellow, terminating, many, appearing in July.—Native of North America, and China near Canton.

14. Sonchus Sibiricus; *Willow-leaved Sow-Thistle.* Peduncles scaly; leaves lanceolate, undivided, sessile; flowers yellow, in a large spreading panicle, appearing in July and August. Perennial.—Native of Sweden and Russia.

15. Sonchus Tataricus; *Tartarian Sow-Thistle.* Peduncles naked; leaves lanceolate, toothed, runcinate. Root perennial, creeping; flowers blue; plant very like the preceding species.—Native of Siberia.

16. Sonchus Tuberosus; *Tuberous-rooted Sow-Thistle.* Lower leaves runcinate, upper sagittate. Corolla blue; all the pistilla in the centre of the flower.—Native place unknown.

17. Sonchus Quercifolius; *Oak-leaved Sow-Thistle.* Stem shrubby; leaves wedge-form, lobed at the edge; lobes remote, acute, toothed, the end ones in threes. Stem one or two feet high, branched, thick and fleshy. Flowers yellow; floscules twice as long as the calix. This is quite distinct, and a very handsome and singular species.—Native of the mountains of Cafsa in Barbary.

18. Sonchus Angustifolius; *Narrow-leaved Sow-Thistle.* Leaves glaucous, smooth, linear; pinnules distant, toothletted. Root long, fusiform, the thickness of a goose-quill, or the little finger, putting forth fibres all over; stem none or short; corolla yellow.—Found near Cafsa in Barbary.

19. Sonchus Chondrilloides. Root-leaves unequally pinnatifid, toothed, narrow; branches rod-like, rushy, one-flowered; plant glaucous and very smooth; floscules yellow, twice as long as the calix; seed small, oblong, brown.—Native of sandy fields in Barbary, Sicily, and Zante.

20. Sonchus Pulchellus. Plant with squamous peduncles; flowers corymbose-racemose; stem-leaves cordate-amplexicaul, ovate-oblong, acute, very entire, glabrous. The flowers of this plant are large, and of a beautiful blue colour.—It grows on the banks of the Missouri.

Sonneratia; a genus of the class Icosandria, or Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, flat, six-cleft, permanent; segments ovate. *Corolla:* petals six, awl-shaped, spreading, inserted into the base of the calix, and scarcely longer than it. *Stamina:* filamenta very many, filiform, inserted into the base of the calix, long; antheræ globular. *Pistil:* germen superior, globular; style filiform; stigma simple. *Pericarp:* berry placed upon the permanent patulous calix, subglobular, acuminate, smooth, with a bladdery pulp, many-celled. *Seeds:* some in each cell. Observe. Sonnerat says, the cells are commonly twenty-six: Gærtner says, twelve or more. Essential Character. *Calix:* six-cleft. *Petals:* six. awl-shaped. *Berry:* many-celled, with several seeds in each cell.——The species are,

1. Sonneratia Acida; *Red-flowered Sonneratia.* Leaves opposite, subsessile, oblong, quite entire; flowers terminating, solitary, large; petals red. This tree is often cultivated near the houses by the Malays, for the sake of the fruit, which smells like rotten cheese, and is, as well as the young leaves, eaten with fish and other food. The beautiful half-expanded flowers are worn as ornaments for the dead.—Native of the Moluccas, the bogs of New Guinea, and of Cochin-china, on the banks of rivers.

2. Sonneratia Apetala; *Small-flowered Sonneratia.* Leaves on the twigs few, opposite, oval-lanceolate, one of the margins more gibbous than the other, quite entire, commonly blunt, without nerves or veins, flat, somewhat fleshy; flowers drooping, greenish, smooth, the size of a nutmeg, axillary, subsolitary, the terminating ones mostly in threes; corolla none; calix coriaceous, thick, four-cleft beyond the middle; segments patulous, acute. This is clearly distinguished from the preceding species, by having the calix divided into four parts only, and in the want of a corolla; but in these distinctions it recedes from the generic character. It is a most beautiful tree, resembling the Weeping Willow, but loftier. The branches are scattered, pendulous, round, and smooth; the twigs opposite, divaricating, subbrachiate, smooth, filiform; fruit an orbicular depressed pome or berry, containing very numerous seeds, having the appearance of fragments of broken teeth, but for the most part irregularly club-shaped, curved, and resembling ivory; they lie in the pulp like pebbles in a pavement.—Native of Rangoon, in the kingdom of Ava, upon inundated banks on the sea-coast.

Sophora; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, short, bell-shaped, gibbous at the base above; mouth five-toothed, oblique, obtuse. *Corolla:* papilionaceous, five-petalled; standard oblong, gradually wider, straight, reflexed at the sides; wings two, oblong, appendicled at the base, length of the standard; keel two-petalled, with the petals conformable to the wings, the lower margins approximating and boat-shaped. *Stamina:* filamenta ten, distinct, parallel, awl-shaped, length of the corolla, within the keel; antheræ very small, rising. *Pistil:* germen oblong, cylindrical; style size and shape of the stamina; stigma obtuse. *Pericarp:* legume very long, slender, one-celled, knobbed at the seeds. *Seeds:* very many, roundish. *Observe.* This genus agrees in every thing with the plants of the class Diadelphia, except in having all the filamenta separate. Essential Character. *Calix:* five-toothed, gibbous above. *Corolla:* papilionaceous, with the wings of the same length with the standard. *Legume:* headed, many-seeded.——The species are,

1. Sophora Tetraptera; *Wing-podded Sophora.* Leaves pinnate; leaflets numerous, (from seventeen to nineteen,) lanceolate, oblong, somewhat villose; legumes quadrangular, membranaceous; stem arboreous.—This magnificent tree is a native of New Zealand, where it displays its pendulous branches of large golden flowers in May and June. Both it and the following species may be raised from seeds, which sometimes ripen in this country: they may also be increased by cuttings and layers; and will endure our climate if planted against a wall, where they may be covered with mats to protect them from severe frost. A finer sight can hardly be imagined than a tree of this sort, extending to a great breadth on a wall with a western aspect.

2. Sophora Microphylla; *Small-leaved Shrubby Sophora.* Leaves pinnate; leaflets very numerous, obovate, somewhat villose; legumes quadrangular, membranaceous. Stem arboreous; flowers large and yellow, appearing in May and June.—Native of New Zealand. See the preceding species.

3. Sophora Flavescens; *Siberian Sophora.* Leaves pinnate; leaflets numerous, oblong, smooth; stem herbaceous, smooth all over.—Native of Siberia.

4. Sophora Alopecuroides; *Fox-tail Sophora.* Leaves pinnate; leaflets numerous, oblong, villose; stem herbaceous. Root perennial, creeping, from which arise several stalks from three to four feet high; flowers pale, greenish-white, in long axillary spikes, standing erect close to the stalk; they have a sweet smell, and appear in July and August.—This increases fast enough by its creeping root, in the same manner as Liquorice; and being very hardy, may be planted in some corner of the garden, at a distance from other plants, which it will otherwise soon overbear. It will thrive in almost any soil and situation.—Native of the Levant.

5. Sophora Tomentosa; *Downy Sophora.* Leaves pinnate; leaflets numerous, roundish, tomentose. Stem downy, six or seven feet high; flowers in short loose axillary spikes, large, pale yellow, scentless, not unlike those of Spanish Broom.—Native of the East and West Indies. This, and the two following species, require the protection of a stove; and may be propagated by seeds, when they can be procured from the countries where they grow naturally. Sow the seeds in pots, plunging them in a good hot-bed, and they will appear in a month or six weeks. When fit to remove, transplant them into separate pots, filled with soft loamy earth, and plunge them into the bark-pit; shading them till they have taken new root. They must be kept in the bark-pit, and have little water in winter.

6. Sophora Occidentalis; *Occidental Sophora.* Leaves

pinnate; leaflets numerous, roundish, hoary, subtomentose. This is suspected to be a mere variety of the preceding species.—Native of the West Indies. In Jamaica it flowers in May and June, and grows chiefly in low-lands near the sea, where it generally rises to the height of six or seven feet.

7. Sophora Monosperma; *One-seeded Sophora.* Leaves unequally pinnate; pinnas five-paired; legumes one-seeded; stem arboreous. This is a small tree ten feet high, with a whitish bark, and a hard wood; corolla large, blue, sweet-smelling.—Native of Jamaica, and other West India Islands.

8. Sophora Japonica; *Shining-leaved Sophora.* Leaves pinnate; leaflets many, ovate, smooth. Stem arboreous; branches round, even, purplish; flowers on panicled racemed branchlets, white, of the same size as in Indigo.—Native of Japan. This may be increased by cuttings.

9. Sophora Heptaphylla; *Seven-leaved Sophora.* Leaves pinnate; leaflets seven, smooth; raceme terminating, long, naked.—Native of the East Indies.

10. Sophora Capensis; *Vetch-leaved Sophora.* Leaves pinnate; leaflets numerous, lanceolate, hoary beneath, pointed; legumes tomentose. Stem shrubby; raceme terminating, composed of white flowers resembling those of *Crotalaria*, and recurved; seeds from three to six, very hard.—Native of the Cape.

11. Sophora Aurea; *Golden-flowered Sophora.* Leaves pinnate; leaflets numerous, elliptic, sharpish, very smooth above, almost naked; legumes smooth; stem shrubby. This shrub is about the height of a man. The root has the smell and taste of Liquorice.—Found in Africa by Bruce.

12. Sophora Argentea; *Silvery-leaved Sophora.* Petioles two-leaved, spinescent; leaflets silky, tomentose, oblong, acute at both ends; legumes flat and one-seeded.—Native of Siberia, on sandy hills in the Songarian Desert.

13. Sophora Genistoides; *Broom-leaved Sophora.* Leaves ternate, sessile; leaflets linear, mucronate, revolute at the edge. The keel of the corolla is horned on both sides, as in *Indigofera.* Shrubby.—Native of the Cape.

14. Sophora Ternata; *Ternate-leaved Sophora.* Leaves sessile; leaflets lanceolate, silky.—Native of the Cape.

15. Sophora Australis; *Blue Sophora.* Leaves ternate, petioled; leaflets obovate, lanceolate, obtuse; stipules lanceolate, acute, twice as long as the petiole. Stem herbaceous, commonly decumbent; flowers blue: they appear in June and July.—Native of Carolina. This, and the two following species, may be propagated by seeds sown on a warm border, in shallow drills, at the beginning of April. When the stalks decay in autumn, take the plants up carefully, and set them in a warm border, where they are designed to remain; for they do not bear transplanting well. They may also be raised on a moderate hot-bed. The first winter they may be placed in a common frame, or covered with mats; and in the following spring turned out of the pots and planted in the full ground, where, if the soil be dry, and the situation sheltered, they will live many years, flowering and producing seeds.

16. Sophora Tinctoria; *Dyer's Sophora.* Leaves ternate, petioled; leaflets roundish, obovate, obtuse, mucronate; stipules obsolete, oblong, acute, many times shorter than the petiole. Root perennial, from which arise several stalks about a foot and half high, sending out from the bottom a great number of small branches. The flowers, which are yellow, and appear in July, come out towards the end of the branches in short spikes. The pods are short and swelling, and in warm seasons come to maturity in England. The stalks decay to the root in autumn. A coarse sort of Indigo was formerly made from this plant in America; whence the trivial name.—Native of Barbadoes and Virginia.

17. Sophora Alba; *White Sophora.* Leaves ternate, petioled; leaflets oblong, obtuse; stipules filiform, shorter than the petiole. Root perennial, sending up every spring a number of leaves in proportion to its size: their footstalks are smooth, rising two feet high, and dividing upwards into three or five branches. The corolla is either white or deep blue.—Native of Virginia and Carolina.

18. Sophora Lupinoides; *Lupine-leaved Sophora.* Leaves ternate, petioled; leaflets elliptic, lanceolate, obtuse, pubescent; stipules lanceolate, longer than the petiole; flowers subsessile, yellow.—Native of Kamtschatka.

19. Sophora Trifoliata; *Three-leaved Sophora.* Leaves ternate, petioled; leaflets ovate, silky.—Native of the Cape.

20. Sophora Calyptrata; *Veiled Sophora.* Leaves simple, elliptic, somewhat rugged above, beneath villose and netted, veined; peduncles one-flowered; calices villose, having a deciduous veil at the base. Stem shrubby; branches stiff, obscurely angular, leafy, tomentose, subdivided; corolla very large, purple; flowers axillary, solitary, on tomentose peduncles, shorter than the adjoining leaf, having a single joint near the flower, the rudiment of which is covered with a globular villose veil, fastened to the joints of the peduncles: as the flower increases, this veil separates from the joint, and falls off when the flower is about half opened: being villose like the calix, and of the same colour, this veil is not easily remarked by an inattentive observer, before it begins to separate, and, failing off before the flower expands, is seldom found in dried specimens, which have generally been gathered when the plants are in full flower.—Native of the Cape.

21. Sophora Biflora; *Two-flowered Sophora.* Leaves simple, ovate, subtomentose; peduncles two-flowered; calices thrust in at the base, tomentose, coloured. Stem shrubby, round, leafy, even, yellow; branches round, tomentose; flowers at the ends of the branches at the last axils of the leaves; corolla large, pale yellow, with purple streaks.—Native of the Cape.

22. Sophora Myrtillifolia; *Round-leaved Sophora.* Leaves simple, elliptic-obovate, obtuse, cusped, silky on both sides; peduncles one-flowered. Stem shrubby, round, leafy, even; branches almost upright, tomentose, somewhat angular towards their tops; flowers towards the ends of the branches; corolla purple, with a paler keel. It flowers from November to January.—Native of the Cape.

23. Sophora Hirsuta; *Hairy Sophora.* Leaves simple, hirsute, the upper ones ovate, the lower roundish; branches round; segments of the calix lanceolate, and length of the wings. Shrubby; flowering in July and August.—Native of the Cape.

24. Sophora Buxifolia; *Box-leaved Sophora.* Leaves simple, oval, smooth above, silky beneath; peduncles one-flowered; calices thrust in at the base, tomentose, coloured. Stem suffruticose, loose, round, leafy, tomentose; branches short, spreading, more tomentose; corolla purple, with paler wings.—Native of the Cape.

25. Sophora Cordata; *Heart-leaved Sophora.* Leaves simple, ovate, hirsute.—Native of the Cape.

26. Sophora Chrysophylla; *Golden-leaved Sophora.* Leaflets obovate, emarginate, silky; clusters lateral. Flowers yellow.—Found in the Sandwich islands.

Sorbus; a genus of the class Icosandria, order Trigynia.—Generic Character. *Calix:* perianth one-leafed, concave, spreading, five-cleft, permanent. *Corolla:* petals five, roundish, concave, inserted into the calix. *Stamina:* filamenta twenty, awl-shaped, inserted into the calix; antheræ roundish. *Pistil:* germen inferior; styles three, filiform, erect; stigmas headed. *Pericarp:* berry soft, glo-

bular, umbilicate. *Seeds:* three, somewhat oblong, distinct, cartilaginous. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Petals:* five. *Berry:* inferior, three-seeded.——The species are,

1. Sorbus Aucuparia; *Mountain Service, Mountain Ash, Quicken Tree,* or *Roan Tree.* Leaves pinnate, smooth on both sides; corollas white, with very concave petals. The flowers are in large terminating pubescent corymbs, very much branched; fruit a pome; seeds three, sometimes four or five. This is a slow-growing and elegant tree, which, as Mr. Gilpin remarks, arrives to a considerable size in the Highlands of Scotland. There, he adds, on some rocky mountains, covered with dark Pines and waving Birch, a few of these trees intermixing have a fine effect. In summer the light green tint of the foliage, and in autumn the glowing berries which hang clustering upon them, contrast beautifully with the deeper green of the Pines: if they are happily blended, and not in too large a proportion, they add some of the most picturesque furniture with which the sides of those rugged mountains are invested. In ancient days, when superstition held that place in society which dissipation and impiety now hold, the Mountain Ash was considered as an object of great veneration. Often, at this day, a stump of it is found in some old burying-place, or near the circle of a Druid temple, whose rites it formerly invested with its sacred shade. Another author observes, that even to this day it may be observed to grow more frequently than any other tree in the neighbourhood of the Druidical circles of stones so often seen in North Britain; and superstitious persons still believe that any small part of it, carried about them, will prove a sovereign charm against all the effects of enchantment and witchcraft. The dairy-maid will not forget to drive her cattle to the *shealings*, or summer pastures, with a rod of the Roan Tree, which she carefully lays up over the door of the *shealboothy*, or summer house, and drives them home again with the same. In Strathspey, they make, on the first of May, a hoop with the wood of this tree, and in the evening and morning cause all the sheep and lambs to pass through it. In Wales, says Mr. Evelyn, this tree is reputed so sacred, that there is not a church-yard without one of them planted in it: so, on a certain day in the year, every body religiously wears a cross made of the wood, and it is reputed to be a preservative against fascinations and evil spirits, whence perhaps we call it *Witchen;* the boughs being stuck about the house, or the wood used for walking-staves. It is curious to observe how the same old superstitions have been driven with the ancient inhabitants into the remote corners of our island, so distinct from each other as Scotland and Wales. In the south of England, the tree is generally known by the name of the *Mountain Ash*, from its growing in high situations, and having pinnate leaves like the Ash; but this name has led ignorant persons to suppose that it has an affinity with the Ash; and even Mr. Gilpin speaks of it as a variety of that tree; whereas it is totally different, except a small resemblance in the leaves. Gerarde calls it the Wild Ash, Quickbeam, or Quicken Tree; Evelyn, the Quickbeam, Wild Sorb, or Witchen, which is otherwise written Whicken or Whitten: but all these names, except Ash and Sorb, are evidently the same, and are derived from the supposed efficacy of the tree in repelling witchcraft. In Scotland and the north of England, it is called *Roan Tree;* and even this name is spelt variously, Rowne, Roddan, and Rantry. The wood is tough and close-grained, but not hard. It may be used in mill-work, and converted into tables, chairs, spokes for wheels, shafts, screws for presses, &c. If the tree be large, it will saw into planks, boards, or timber, and is preferred by wheelwrights because it is all heart. Besides the use of it in making husbandmen's tools, the roots are formed into handles for knives, and spoons. Withering and Lightfoot say, that the berries dried and reduced to powder make wholesome bread; and that an ardent spirit of a fine flavour may be distilled from them in small quantities. The Scotch Highlanders, as well as the inhabitants of Kamtschatka, make use of the berries for those purposes; and the poor people in Wales infuse the berries in water, and drink the liquor, which is acid, and like perry. In the island of Jura, the juice of the berries is used in making punch. The German fowlers bait springes or nooses of hair with these berries, to entrap the redwings and fieldfares; whence the trivial name *Aucuparia.* —Native of the colder parts of Europe, of Mount Libanus, and Siberia. Found in woods and hedges, on mountainous and boggy situations in the north of England, and in Wales, Scotland, and Ireland, flowering in May. In the southern counties it is seldom found of any size, but in the northern counties and in Wales there are trees of very large growth. The leaves make a pretty variety, when mixed with other trees in plantations. It is also handsome in flowering and fruiting; but blackbirds and thrushes are so fond of the fruit, that they devour it before it is properly ripe.—*Propagation and Culture.* All the species may be propagated by sowing their seeds in pots soon after the fruit is ripe, sheltering them under a common frame in winter, and plunging the pots into a moderate hot-bed in the spring, which will soon bring up the plants, which should be carefully freed from weeds, and watered in dry weather, and then should be exposed to the open air; for the only reason for putting them in a hot-bed is to forward the growth of the seeds; but when the plants are come up, if the bed be kept covered, it will draw the plants and spoil them. Let them remain in this bed till the middle of October; when the leaves will decay, and a warm light spot of ground must be prepared to receive them; into this they should be planted, in rows two feet asunder, and a foot distant in the rows, observing to take them up carefully, and to plant them as soon as possible, that their roots may not dry. During the summer, the ground should be kept constantly clear from weeds, and in winter there should be a little mulch laid upon the surface of the ground about their roots, to protect them from being injured by frost; but in the spring the ground between them should be dug, burying the mulch therein, in doing of which you must be careful not to cut or injure the roots of the plants. In this nursery they may continue three or four years, according to their growth; it will then be proper to transplant them out where they are to remain; the best season for which is in October, or in the spring, just before they begin to shoot. The soil should be warm in which they are planted, and the situation defended from cold winds, which will cause them to thrive, and produce fruit in a few years. Mr. Boutcher recommends, when the seedling plants have stood a year, to remove them and let them stand two seasons more; then cutting away all cross, downright, or superfluous roots, to remove them into another nursery, planting them three feet and a half by eighteen inches asunder, there to remain three years, when they will be of proper size to remove where they are to continue. They may also be raised by layers, but the trees so obtained will neither be so straight nor so handsome as those which are raised from seeds.

2. Sorbus Hybrida; *Bastard Service,* or *Mountain Ash.* Leaves semipinnate, tomentose beneath. This is a middle-sized tree, with white flowers, and fruit as in the preceding species, but a little larger.—It may be propagated in the same way, but requires a moist strong soil, and will grow in

the most exposed places, being extremely hardy, which renders them worthy of care, since they will succeed where few other trees can live. If the fruit be sown in the common ground, it will frequently be the second spring before it makes its appearance, as in the Hawthorn. It should therefore be stripped of its pulp, and put in sand.

3. Sorbus Domestica; *True Service*, or *Sorb*. Leaves pinnate, villose underneath; flowers in terminating panicles, subcorymbed, tomentose; petals cream-coloured, concave, with hairy claws; calix very woolly; fruit pear-shaped, reddish and spotted, extremely austere, and not eatable till it is quite mellowed by frost or time, when it becomes brown and very soft. In the middle are five cells, with one seed in each, as in the Apple and Pear, with which this certainly agrees in the fruit and number of styles; but if general habit has any weight in the arrangement of plants, this tree ought not to be united to them. There are several varieties, which differ in the number of their seeds; some having three only, others four or five. When it is said, therefore, that one character of the genus is to have three seeds, it must be understood of the wild tree; but in trees that are cultivated, the number of seeds is as uncertain as in Apples and Pears.—Great numbers of these trees grow wild about Aubigny in France; this species is indeed a native of the warm countries of Europe, where it becomes a large and lofty tree, and the wood is used by the turners, and for making mathematical instruments, and excisemen's gauging-sticks. The fruit, which is like an inferior Medlar, is there reputed good in the dysentery and fluxes. Ray observed it growing in many mountainous parts of Cornwall. It flowers in May.—Those persons who raise many of these trees from seeds, will obtain some varieties of the fruit, from which the best may be selected, and propagated for the table; and the others may be planted for variety in wilderness or wood-walks, or may be used for stocks to graft the better kinds upon. There is a variety with variegated leaves, which is preserved by such as are curious in collecting the several sorts of striped plants, but there is no great beauty in it: it may be propagated by layers, or by being budded on the plain sort, but they become plain on a very rich soil.

4. Sorbus Microcarpa. Leaves pinnate; little leaves acuminate, unequally inciso-serrate; serratures setaceous-mucronate; branches covered with a shining dark brown gloss; berries small, scarlet.—A large shrub, growing on the peaks of high mountains from New Jersey to Carolina. Pursh considers this species very distinct from the first; though other authors appear to have confounded them.

Sorrel. See *Rumex*.

Sorrel Tree. See *Andromeda Arborea*, and *Ramex*.

Sorrel, Wood. See *Oxalis*.

Sour Gourd. See *Adansonia*.

Soursop. See *Annona*.

Southernwood. See *Artemisia*.

South Sea Tea. See *Ilex*.

Sowbane. See *Chenopodium Murale*.

Soy, Soya, or *Soye*. See *Dolichos*.

Sowbread. See *Cyclamen*.

Sowthistle. See *Sonchus*.

Spanish Brown. See *Spartium*.

Spanish Cress. See *Vella*.

Spanish Elm. See *Cordia Gerascanthus*.

Spanish Hedge Nettle. See *Prasium*.

Spanish Potatoes. See *Convolvulus Batatas*.

Sparganium; a genus of the class Monœcia, order Triandria.—Generic Character. *Male flowers* numerous, collected into a head. *Calix*: ament common roundish, very closely imbricate on all sides, consisting of proper perianths, that are three-leaved, linear, deciduous. *Corolla*: none. *Stamina*: filamenta three, capillary, longer than the calix; antheræ oblong. *Females*: below the males. *Calix*: as in the male, according to Gærtner, six-leaved; receptacle, common roundish. *Corolla*: none. *Pistil*: germen ovate, ending in a short awl-shaped style; stigma one or two acute, channelled, permanent. *Pericarp*: drupe juiceless, turbinate, with a point, angular below. *Seed*: nut bony, oblong-ovate, angular. *Observe*. Tournefort remarked, that the seed in some species is one-celled, in others two-celled; though neither Adanson nor Gærtner could ever find two seeds or a two-celled drupe. Essential Character. *Male* and *Female*. *Ament*: roundish. *Calix*: three-leaved. *Corolla*: none. *Female*. *Stigma*: bifid. *Drupe*: juiceless, one-seeded.——The species are,

1. Sparganium Ramosum; *Branched Bur-reed*. Leaves triangular at the base, their sides concave; common flower-stalk branched; stigma linear. Root perennial, creeping; stem upright, about three feet high, round, leafy, smooth; heads of flowers alternate, sessile, many-flowered. The fruit ripens into brown prickly heads of dry, deciduous drupes, by which, as well as its spreading roots, the plant increases abundantly. The parts of fructification vary much in number, as is usual in Monœcious and Diœcious plants, and is one of the many reasons for keeping them in distinct classes from the hermaphrodite ones.—It is common in ditches, and along the banks of rivers, not only in Europe, but in Barbary, Siberia, and North America, flowering in July and August. Having a very strong creeping root, it soon fills up a ditch or pond, if suffered to remain unmolested; the smaller brooks are soon clogged by it, and it forms dams with other aquatic plants, which arrest the descending soil, and acumulate islands or banks of earth.

2. Sparganium Simplex; *Unbranched Bur-reed*. Leaves triangular at the base, their sides flat; common flower-stalk simple; stigma linear. This is seldom found more than one-fourth of the height of the preceding species, but the flower is larger in proportion: the flowers of the former look yellow before they blow, and have none of that blackness about them so conspicuous in the latter.—It is found, in general, upon particular spots, especially on heaths and commons in pools of water made by digging gravel, throughout Europe, as well as in North America; and flowers in July and August.

3. Sparganium Natans; *Floating Bur-reed*. Leaves drooping, flat; heads of flowers in a single spike, most of them accompanied by leaves; style not longer than the germen. Root perennial, creeping, with long fibres, running deep into the muddy bottoms of ditches or slow streams; stems ascending, round, leafy; the fruit is a one-seeded drupe. When the plant flowers, the flowering-stem is very slender, and does not rise about six inches out of the water; it is simple, with few balls of female flowers, not larger than a pea, while the leaves float on the water to a considerable length.—It prefers a muddy or clayey soil, and occurs in Cambridgeshire, near Lawston Moor; on Wilbraham Moor, and Burwell Fen; near Norwich; in Yorkshire and Westmoreland; in Scotland, and in Wales; flowering in July.

4. Sparganium Angustifolium; *Narrow-leaved Bur-reed*. Leaves flat, lax, larger than the stem; heads of male flowers numerous; stigma oval; drupe obovate, even, depressed at the summit.—Found in New South Wales.

Sparrmannia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix*: perianth four-leaved; leaflets lanceolate, entire, reflex, villose. *Corolla*:

petals four, equal, wedge-shaped, entire, flat, twice as long as the calix; nectaries proper, difform, filiform, torulose, shorter than the stamina; swellings inflated, turbinate. *Stamina:* filamenta very many, inserted into the germen, filiform; outer like the nectaries, but longer, shorter however than the corolla; antheræ ovate-cordate, placed on the top of the filamenta. *Pistil:* germen subglobular, five-cornered, hispid, superior; style filiform, straight, hanging down among, and much longer, than the stamina; stigma truncate, terminated by elongated papillæ. *Pericarp:* capsule five-cornered, five-celled, echinate, with straight, rigid, hairy bristles; terminated by a pellucid, straight, pungent spine, larger, and more pungent at the corners. *Seeds:* two in each cell, oblong, smooth, keeled on one side. Essential Character. *Calix:* four-leaved. *Corolla:* of four reflexed petals. *Nectary:* several, torulose. *Capsule:* angular, five-celled, echinate.——The only species known is,

1. Sparrmannia Africana. This beautiful shrub grows to the height of six feet or more, and is thickly divided into alternate branches, finely clothed with large cordate and lobed pendulous leaves, upon erect footstalks, making a very handsome appearance, even in foliage, in which state it much resembles a *Sida*. Its fine umbels of flowers are produced plentifully along the branches, opposite to the leaves, in the same manner as in the common species of *Pelargonium*, which it much resembles in its inflorescence, the flowers nodding before they are expanded, and becoming erect as they approach maturity. The petals, which are of a snowy white, remain but a short time open, being soon reflected with the calix, which is white like the petals, but covered, as is the whole plant, except the petals, with fine hairs. The singular nectaries surround the filamenta, which they so nearly resemble, that a superficial observer might easily confound them; they are numerous, shorter than the purple filamenta, of a yellow colour, and torulose or knobbed at the upper part: they have no antheræ, but purple tips, not unlike them.—Native of the Cape of Good Hope, growing in Essebosch and Hontinquas woods, and the sides of the mountains at Large Kloof, where it was found by the celebrated traveller Andrew Sparrmann, after whom it was accordingly named.—It may be readily increased by cuttings, if treated in the same manner as the tenderer species of *Pelargonium*.

Sparrowwort. See *Passerina*.

Spartium; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, cordate-tubular; at the upper edge very short, below towards the tip marked with five toothlets, coloured, small. *Corolla:* papilionaceous, five-petalled; standard obcordate, the whole reflexed, very large; wings ovate-oblong, shorter than the standard, annexed to the filamenta; keel two-petalled, lanceolate-oblong, longer than the wings, (the carinal margin connected by hairs,) inserted into the filamenta. *Stamina:* filamenta ten, connate, adhering to the germen, unequal, gradually longer; the upper one very short, the lower nine in one set; antheræ oblongish. *Pistil:* germen oblong, hirsute; style awl-shaped, rising; stigma growing to the upper side of the top, oblong, villose. *Pericarp:* legume cylindric, long, obtuse, one-celled, two-valved. *Seeds:* many, globe-kidney-form. Essential Character. *Calix:* produced downwards. *Filamenta:* adhering to the germen. *Stigma:* longitudinal, villose above.——The species are,

1. Spartium Contaminatum: *Narrow-leaved Broom.* Branches round; leaves alternate, filiform, stained at the base; stem shrubby, rod-like, branched at the base, round, even; raceme long, erect, terminating, with the flowers alternate, of a tawny colour, with a yellow keel.—Native of the Cape. This, and all the natives of warm climates, require the dry-stove.

2. Spartium Separium; *Hedge Broom.* Branches rugged; upper leaves clustered, filiform; racemes terminating; flowers yellow.—Native of the Cape of Good Hope.

3. Spartium Junceum; *Spanish Broom.* Branches opposite, round, flowering at the top; leaves lanceolate. The flowers are disposed in a loose spike; they are large, yellow, with an agreeable odour, appearing in July, and in cool seasons continuing in succession to September. The bees are very fond of the flowers; and the same qualities which are attributed to the Common Broom, belong also to this, at least in an inferior degree. In Languedoc they make a thread of it, and use the plant as green food for sheep. There is a variety of it with double flowers, which is very unusual in the natural order to which it belongs.—Native of all the southern countries of Europe; Spain, Portugal, Italy, Sicily, Carniola, the south of France: found also in Judea, between Joppa and Ramah. It is easily propagated by seeds, sown in the spring upon a bed of common earth, in a shady situation, where the plants will rise very freely. They must be kept clear from weeds during the following summer, and in autumn may be taken up and transplanted into a nursery, which should be chosen in a warm sheltered situation.

4. Spartium Monospermum; *White-flowered Single-seeded Broom.* Branches round, striated; racemes few-flowered; flowers subaggregate; leaves lanceolate, silky. Stem upright, very much branched, as thick as the thumb, and sometimes as the arm. This is a very handsome shrub, remarkable for its numerous snow-white flowers. It is of very great use in stopping the sand, and converts the most barren spot into a fine odoriferous garden, by its flowers, which continue a long time. It serves to shelter hogs and goats against the scorching heat of the sun, and affords to the latter animals a favourite food in its leaves and young branches. The twigs are used for tying bundles; and all kinds of herbs, when brought to market, are found tied with them. It has been found on the sandy coast of Barbary, and in Arabia. The Spaniards call it Retamas, from the Arabic name Rœtam.—Native of dry barren hills in Spain and Portugal, and Morocco: observed about Cadiz, near the coast, flowering in February; also in abundance in Arragon. Osbeck remarks, that it grows like Willow bushes, along the shores of Spain, as far as the flying sands reach, where hardly any other plant except Ononis Repens, will grow. To propagate this, and the next species, sow the seeds about the middle of April, upon a bed of fresh light earth, in drills half an inch deep; the drills not less than a foot asunder, and the seeds three inches apart. Remove them at Michaelmas, for, if suffered to stand longer, they shoot downright roots to a great depth, and if these roots be cut or broken when they are grown large, the plants frequently miscarry. If the season be unfavourable, defer the sowing, for the seeds are liable to perish in the ground by cold or wet. The best rule is to sow them at the same time with Kidney-beans. At Michaelmas some of the plants may be potted, to be sheltered in winter, and the rest planted in a warm soil, where, if the winter should not prove severe, they will stand very well. If some of the plants are left in the seed-bed, they may be sheltered with mats in severe frosts, and some mulch laid about their roots. In this country it flowers in June and July.

5. Spartium Sphærocarpum; *Yellow-flowered Single-seeded Broom.* Branches round, striated; racemes many-flowered; flowers remote; leaves lanceolate, sessile, pubescent beneath; stem upright. It flowers in June and July.—Native of the south of Europe, and of Barbary.

6. Spartium Purgans; *Purging Broom.* Branches round, striated; leaves lanceolate, subsessile, pubescent; stalks striated, taper, four feet high; flowers in spikes, terminating, large, and pale yellow.—Native of the south of France, the county of Nice, of Arragon in Spain, and of Japan. Treat it in the same manner as the fourth species.

7. Spartium Aphyllum; *Leafless Broom.* Branches round, striated, smooth, rod-like; leaves very short, linear, propped; flowers small, dull violet, pedicelled, forming a raceme on the side of the branchlets.—Found in the driving sands of the Wolga Deserts.

8. Spartium Virgatum; *Twiggy Broom.* Branches round, striated; leaves lanceolate, oblong, silky; calices funnel-form, two-lipped, rough-haired; standard and keel pubescent. It is a shrub, about three feet high, with a trunk of about a finger's thickness, divided into numerous branches. The flowers are yellow, and sweet-scented. It flowers from March to June.—Native of the island of Madeira.

9. Spartium Decumbens; *Trailing Broom.* Stem decumbent, branched; leaves solitary, ovate; flowers on long peduncles. Flowers smaller by half than in the Common Broom, and less placed on one side. It flowers here in May and June.—Found in Burgundy and Switzerland. For its culture, see the third species.

10. Spartium Scorpius; *Scorpion Broom.* Branches spiny, spreading; leaves ovate. The whole shrub is covered with alternate spines, on which the flowers are placed; these spines render it quite inaccessible. The flowers are yellow, and rather large: they appear in March and April.—Native of the south of Europe and of Barbary. To be cultivated in the same manner as the third species.

11. Spartium Aspalathoides; *Tubercular Thorny Broom.* Branchlets bowed, smooth, tubercled, flower-bearing; leaves linear-lanceolate; flowers axillary, pedicelled; calix three-parted; corollas silky. This is a very branching shrub.—Native of Barbary. See the fourth species.

12. Spartium Multiflorum; *Portuguese White Broom.* Leaves ternate or simple, silky; shoots strict, striated, flowering on every side. This shrub is very much branched. Flowers in long lateral racemes, so numerous that it seems wholly covered with them; standard of the corolla erect, not reflex, involute, beautifully marked with purple lines radiating from the base; the rest of the corolla white.—Native of Portugal and Mount Atlas. See the third species.

13. Spartium Angulatum; *Angular-branched Broom.* Leaves ternate and solitary; branches hexangular, flowering at the end; flowers small, of a pale yellow colour, produced in loose spikes at the end of the branches, which, as well as the stalks, are slender.—Native of the Levant.

14. Spartium Scoparium; *Common Broom.* Leaves ternate and solitary; branches unarmed, angular; flowers axillary, solitary; legumes ciliate. This grows from three to six feet high, and is very much branched; leaves deciduous, smooth or somewhat hairy; flowers loosely pendulous, on long stalks; corolla large, handsome, of a fine gold colour, sometimes tinged with orange or tawny on the outside, and sometimes, but less often, wholly lemon-coloured; legume compressed, two inches long, smooth, fringed at the margin with dense deciduous hairs; seeds as many as eighteen or twenty, small, of an oblong-elliptic form, compressed, glossy, dingy yellow, beaked above the navel, with a short point. It merits a place among our flowering shrubs, especially the variety with a purple calix, and the flowers strongly tinged with orange. There is another variety much more hoary than usual. But even in its common state, such is the profusion of golden-coloured blossoms with which its branches are loaded in summer, and such the verdure of its twigs in winter, that it may vie with most of the foreign Brooms, and is superior to some of them as an ornamental shrub.—Common on sandy or gravelly dry hills, in the north or middle of Europe, and abundant in this country, flowering in May and June. It is used for besoms, which are generally called Brooms on that account, of whatever substance they happen to be made. In the northern parts of Great Britain, it serves for thatching cottages, corn and hay-ricks, and as a substitute for reeds, in making fences or screens. In some parts of Scotland, where coals and wood are scarce, whole fields are said to be sown with it for fuel. The twigs, when bruised, smell disagreeably, which, in addition to their nauseous bitter taste, may be the reason why cattle in general will not eat it; though they shew great fondness for Broom fields, probably because they can best brush off the swarms of flies, which torment them in summer, with its tough yielding branches. Bees are fond of the flowers; and the flower-buds are pickled in the same manner as capers just before they become yellow. The branches are said to be capable of tanning leather; but whether that be the fact or not, it is pretty certain that the brewers are very capable of substituting those branches in great abundance, for the sake of sparing themselves the cost of the more pleasant and wholesome Hop. The branches are also said to be capable of being manufactured into coarse cloth; and when tender, they are sometimes used along with Hops, in private brewing. The old wood of this plant furnishes the cabinet-maker with the most beautiful material for veneering.—We have seen that the Broom claims some attention in rural and domestic economy; we shall now advert to its use in medicine, upon the authorities of Ray, Mead, Cullen, and Withering. A decoction of the young twigs is an excellent medicine in the jaundice and dropsy. It operates by urine, and removes obstructions of the liver, reins, bladder, and other parts. A dropsical patient, who had borne the operation of tapping three times, and taken all the remedies usually prescribed in such cases, without experiencing the least relief, was perfectly cured by taking, every night and morning, half a pint of a decoction of Green Broom tops, with a spoonful of whole Mustard-seed. After taking it a little while, the thirst, which before was excessive, became moderate, the swelling subsided, and the urinary discharge increased to the quantity of a gallon and half, or more, in a day. An infusion of the seeds drank freely, has been known to produce similar happy effects; but whoever expects that every dropsy will yield to this medicine, will be very much deceived. Out of a great number of cases, in which this medicine was allowed a fair trial, only one succeeded. A strong lye, made of the ashes, was used in the Swedish army in the year 1759, to cure dropsies, which succeeded a catarrhal epidemic fever; in consequence of which the urine became plentiful, and the dropsies quickly disappeared. Cullen ordered half an ounce of fresh Broom tops to be boiled in a pound of water, till one half was consumed, and gave two table-spoonfuls of the decoction every hour, till it operated by stool, or till the whole was taken. It seldom failed to operate both by stool and urine; and by repeating the medicine every day, or every second day, some dropsies have been cured. The plant, when burnt, affords a tolerably pure alkaline salt; and upon this salt the efficacy of Broom in dropsies must depend. The ashes were used principally on the authority of Sydenham, whose account of their good effects has been since confirmed by Dr. Monro and other writers. The same qualities with good reason have been attributed to the third species, and to *Genista Tinctoria*; which see.

15. Spartium Umbellatum; *Umbelled Broom.* Leaves ternate and simple; branches very numerous, round, striated, opposite and alternate; flowers in terminating heads; corollas and legumes silky.—Native of Barbary, on dry hills on the sea-coast, near Arzau.

16. Spartium Ferox; *Sharp-thorned Broom.* Leaves ternate and simple, mucronate; flowers in terminating racemes; branches striated, spinescent; legumes compressed, somewhat torulose, elongated, hoary, with a very short lanugo. Stem upright, three or four feet high, with numerous straight leafy branches; flowers numerous; corolla yellow.—Native of Barbary.

17. Spartium Horridum; *Rough Broom.* Leaves ternate, complicate, silky; branchlets round, spiny, opposite; corolla yellow. This is a very densely branched shrub like a Furze bush, beset with innumerable thorny, clustered, somewhat hairy branches, bearing a very few and small leaves.—Found in Spain.

18. Spartium Patens; *Woolly-podded Broom.* Leaves ternate; branches rod-like; flowers lateral, in pairs, drooping. The branches being fully furnished with flowers in every part, during the continuance of the flowers this shrub makes a fine appearance.—Native of Portugal. See the third species for its culture.

19. Spartium Arboreum; *Tree Broom.* Leaves ternate, obovate; branches striated; flowers aggregate, axillary, nodding; legumes villose, with the hairs pressed close. This grows from eight to twelve feet high, with a trunk often as thick as the human arm; corolla deep yellow, shining, a little inflated.—Native of Mount Atlas, and the valleys near Algiers. See the fourth species.

20. Spartium Biflorum; *Two-flowered Broom.* Unarmed: branchlets angular; leaves petioled, ternate, linear, subvillose; flowers in pairs, terminating; legumes smooth.—Native of Mount Atlas, near Tlemsen.

21. Spartium Linifolium; *Flax-leaved Broom.* Unarmed: branches angular; leaves sessile, ternate; leaflets linear, hoary beneath; flowers in terminating racemes; corolla yellow.—Native of the mountains near Algiers.

22. Spartium Sericeum; *Silky Broom.* Unarmed, silky: leaves ternate; leaflets linear; racemes terminating; branches angular.—Native of the Cape.

23. Spartium Cytisoides; *Cytisus-leaved Broom.* Unarmed, silky: leaves ternate; leaflets lanceolate, bluntish; racemes terminating; branches round. It flowers in April.—Native of the Cape.

24. Spartium Nubigenum; *Cluster-flowered White Broom.* Leaves ternate, lanceolate, hairy, petioled; flowers in lateral bundles; legumes smooth; branches round, striated. This, at first sight, resembles the third species, but the leaves are ternate, and the branches grooved; the ends of the branches are often leafless. It is a valuable shrub, on account of the abundance of its white flowers.—Native of the Peak of Teneriffe.

25. Spartium Radiatum; *Starry Broom.* Leaves ternate, linear, sessile; petioles permanent; branches opposite, angular; clusters capitate, terminal; legume ovate, hairy. In its natural state this is a low shrub; when cultivated, it becomes much larger, though rarely exceeding two feet and a half in height; but the branches spread very much, and form a large bush. The great abundance of naked radiating branches, crowned with tufts of handsome yellow flowers, readily distinguish this species. It flowers in June, and the seed ripens in August.—Native of the mountains of Italy and Carniola. Sow the seed in autumn, in a bed of common earth, in rows. The following autumn remove the plants from the seed-bed to the places where they are to remain, or into a nursery for a year or two, to get strength; but they will not bear transplanting when large. It is tolerably hardy with us, and will bear our winters, except when severe.

26. Spartium Spinosum; *Prickly Broom.* Leaves ternate; branches angular, spiny; flowers numerous, pedicelled, axillary, solitary, and aggregate; corolla yellow, smooth, only half the size of the Common Broom.—Native of Italy and Spain, near the sea-coast; also of Algiers.

27. Spartium Villosum. Leaves ternate; branches spiny; calices and legumes villose. This resembles the preceding very much; but is distinguished from it by its thick legume, covered with a very close wool.—Found in Barbary, and the neighbourhood of Naples.

Spathelia; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth five-leaved; leaflets oblong, coloured. *Corolla:* petals five, oblong, equal. *Stamina:* filamenta five, awl-shaped, ascending, marked with a tooth at the base; antheræ ovate. *Pistil:* germen ovate, shorter than the stamina; styles three, very short; stigmas three, roundish. *Pericarp:* capsule oblong, three-cornered, three-winged, three-celled; cells accompanied by a lateral resiniferous canal. *Seeds:* solitary, oblong, three-sided. Essential Character. *Calix:* five-leaved. *Petals:* five. *Capsule:* three-cornered, three-celled. *Seeds:* solitary.——The only known species is,

1. Spathelia Simplex; *Rhus-leaved Spathelia,* or *Spathe.* This tree rises by a single slender stem, like the Palms, and bears all its oval leaves in a pinnated order, on moderate ribs, disposed closely together about the top, from the centre of which the flower-spike rises; this is very spreading, and generally shoots so as to appear a large blooming pyramid of purple flowers, many feet above the foliage. The trunk is seldom divided, but is so very like that of the Maiden Plum-tree (see *Comacladia*) both in size and appearance, that they cannot be distinguished out of flower. This would make a beautiful flowering shrub, for it seldom rises above fourteen or sixteen feet, and its flowering top is generally from four to six feet in height.—Native of Jamaica, where Browne says it is frequent by the sides of rivers, among the rocky hills; and makes a beautiful appearance in the woods when in bloom.

Spatling Poppy. See *Cucubalus Behen.*

Spear, King's. See *Asphodelus.*

Spearmint. See *Mentha.*

Spearwort. See *Ranunculus.*

Speedwell. See *Veronica.*

Spelt, Spelta. See *Triticum.*

Sperage. See *Asparagus.*

Spergula; a genus of the class Decandria, order Pentagynia.—Generic Character. *Calix:* perianth five-leaved; leaflets ovate, obtuse, concave, spreading, permanent. *Corolla:* petals five, ovate, concave, spreading, bigger than the calix, undivided. *Stamina:* filamenta ten, awl-shaped, shorter than the corolla; antheræ roundish. *Pistil:* germen ovate; styles five, from erect reflex, filiform; stigmas thickish. *Pericarp:* capsule ovate, straight, one-celled, five-valved. *Seeds:* very many, depressed, globular, girt with an emarginate rim. *Observe.* It is distinguished from *Cerastium* by its entire petals. The second species has only five stamina. Essential Character. *Calix:* five-leaved. *Petals:* five, entire. *Capsule:* ovate, one-celled, five-valved.——The species are,

1. Spergula Arvensis; *Corn Spurrey.* Leaves whorled; fruiting peduncles reflexed; seeds kidney-shaped, angular, rough. Root annual, small, fibrous; stems numerous, a span or a foot in length; panicle dichotomous, divaricating,

many-flowered. The chief use made of this plant abroad is for feeding sheep and cattle in winter, when the common grass is eaten bare. The inhabitants of Finland and Norway make bread of the seeds, when their crops fail. Poultry, and birds in general, are very fond of the seeds. Mutton which has been fed upon it is well-tasted, and it is thought to cause cows to yield an extraordinary quantity of milk, and poultry to lay abundance of eggs. Cattle prefer it when green to almost any other plant, and sheep especially are exceedingly fond of it. Though cultivated in Holland as a useful plant, and in some parts of Scotland, where they call it *Yarr*, it is a very pernicious weed among corn-crops, particularly in spongy soils. In Norfolk they call it *Pickpurse* and *Sandweed*, by way of contempt.—Native of corn-fields and waste ground, on a sandy soil, throughout Europe, flowering from July to September. The usual time for sowing the seed of this plant to feed cattle, is in July or August, that they may acquire strength before winter. As it will grow on the poorest sand, it may be cultivated in many places to good advantage, where no grass will thrive well; and by feeding it off the ground, the dung of the cattle or sheep will improve the land. About twelve pounds of seed is sufficient to sow an acre: the ground should be well harrowed before they are sown. In the Low Countries it follows a crop of corn: and the second species is now much cultivated in Flanders; for though it is a much lower plant, the Flemings prefer it to this species. If sown in April, they will ripen in August. The crop must be cut before the heads are quite brown, otherwise the seeds will soon scatter.

2. Spergula Pentandra; *Little Corn Spurrey*. Leaves whorled; flowers five-stamined; seeds depressed, winged. This has all the habits of the preceding, but is smaller, and has fewer and less fleshy leaves; the chief difference is found in the seeds, which are compressed and lenticular, smooth, and bordered by a conspicuous whitish membrane. It is cultivated in the same way as the preceding species.—Native of Germany, France, Spain, and Ireland.

3. Spergula Nodosa; *Knotted Spurrey*. Leaves opposite, awl-shaped, even, the upper ones in bundles; calix nerveless. Root perennial, fibrous; stems several, four inches or more in length, procumbent, but sometimes nearly upright. This elegant little plant recommends itself to our notice by the beauty of its verdure, and the largeness of its flowers; the size and pure whiteness of which, joined to its place of growth, serve to distinguish it from those plants which have some resemblance to it in the foliage.—It is found in the greatest part of Europe, in moist situations, frequently among herbage, and sometimes growing out of walls, rocks, or stones. It flowers in July and August, and is a very scarce plant in the neighbourhood of London; but has been observed growing out of the wall by the Thames' side in several places betwixt Lambeth and Putney; and on Hounslow and Hampstead heath; also at Harefield Moor in Middlesex. It is very common in the north of England on the borders of rivulets; found also in plenty on the boggy ground below the Red Well of Wellingborough in Northamptonshire; on Shotover hill, and near Stow wood in Oxfordshire; at Ampthill and Stevington, in Bedfordshire; on Hinton and Feversham moors, and at Gamlingay in Cambridgeshire; on the boggy ground in Sutton Park, Warwickshire; on the bogs about Settle, Yorkshire; and Chorley Forest and Beacon Hill in Leicestershire; not seldom in Dorsetshire; but in abundance by the river Avon, in the marsh between the town and the river at Ringwood: in Wales, by the side of the lake at Llanberis; and in the wet pastures, and on the sides of lakes and marshes in Scotland.

4. Spergula Laricina; *Larch-leaved Spurrey*. Leaves opposite, awl-shaped, ciliate, in bundles. Root perennial; stems decumbent, branched, leafy, round; flowers terminating and lateral, solitary.—Native of Siberia.

5. Spergula Saginoides; *Smooth Awl-shaped Spurrey*. Leaves opposite, awl-shaped, awnless, naked; peduncles solitary, very long, smooth. Root perennial, fibrous; herb entirely smooth.—Native of Sweden, Switzerland, France, Siberia, and Scotland, on mountains.

6. Spergula Subulata; *Ciliated Awl-shaped Spurrey*. Leaves opposite, awl-shaped, awned, ciliate; peduncles solitary, very long, somewhat hairy. Root perennial, fibrous; stems several, an inch or two in length; flowers drooping a little; petals white.—Native of Denmark, Sweden, Germany, and Britain, on sandy commons and dry gravelly pastures. It flowers from June to August. It is often found on Putney Heath; about Coombe Wood; on Bagshot Heath, near Cobham and Esher; on Uxbridge Moor; in Dorsetshire, Devonshire, and Cornwall, in Scotland near Forfar, and between Dundee and St. Andrew's; also in the Isle of Bute. It flowers from June to August.

7. Spergula Glabra; *Smooth Spurrey*. Leaves opposite, bundled, filiform, smooth; flowers ten-stamined. Petals white, larger than the calix; stems procumbent, round, knotted, at each knot a pair of linear subulate leaves. Sometimes the flowers have six styles.—Native of Piedmont, in alpine pastures.

Spermacoce; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth small, four-toothed, superior, permanent. *Corolla:* one-petalled, funnel-shaped; tube cylindric, slender, longer than the calix; border four-parted, from spreading reflexed, obtuse. *Stamina:* filamenta four, awl-shaped, shorter than the corolla, or standing out; antheræ simple. *Pistil:* germen roundish, compressed, inferior; style simple, but cloven above; stigmas obtuse. *Pericarp:* capsules two, connate, oblong, gibbous on one side, flat on the other, obtuse, each two-horned. *Seeds:* solitary, roundish. *Observe.* The fourteenth species has a turbinate-campanulate erect corolla, and is manifestly one-capsuled and two-celled, not two-capsuled. Gærtner describes the first species as one-capsuled. Swartz says, that the fruit is always two-celled, bipartile when ripe, naked, or covered with a thin crust, like a capsule, and therefore nearest to Diodia. Essential Character. *Corolla:* one-petalled, funnel-shaped. *Capsules:* two, combined, two-toothed.——The species are,

1. Spermacoce Tenuior; *Slender Button-weed*. Smooth: leaves lanceolate, rough on the upper side; flowers whorled; seeds rough-haired; stamens shorter than the corolla. Stalks stiff, a little angular, and covered with a brown bark. The flowers grow in slender whorls toward the top of the stalks; they are small, white, and sessile.—It is an annual plant, native of Carolina, and of the West Indies. In Jamaica it is found only in the woods, and is there observed to be sometimes upright and sometimes a climber; when erect, it generally rises to the height of two or three feet; but when assisted by the neighbouring shrubs, it grows commonly to twice or three times that length. It is called there Iron-grass. It flowers from June to August.——Sow the seeds of these plants on a hot-bed, and when the plants come up, transplant them to a fresh hot-bed to bring them forward, and afterwards treat them in the same way with other tender plants from the East and West Indies. If they are placed in a stove, they will live through the winter, and produce good seeds.

2. Spermacoce Latifolia; *Broad-leaved Button-weed*. Smooth: leaves ovate; stamina standing out; flowers in

whorls; stipules ciliate. This is an herbaceous plant. The flowers are white.—Native of Cayenne, growing by pathways, and in open plains.

3. Spermacoce Cœrulescens; *Blue-flowered Buttonweed.* Leaves ovate-acute, somewhat hairy, even; stipules equalling the whorled flowers; stamina standing out.—Native of Cayenne and Guiana, by way-sides.

4. Spermacoce Alata; *Wing-stalked Buttonweed.* Smooth: leaves ovate, the uppermost sessile; flowers terminating in heads. Stem four-cornered, winged, creeping; corollas blue. —Native of Cayenne and Guiana, on the banks of rivers.

5. Spermacoce Hexagona; *Hexagon-stalked Buttonweed.* Smooth: leaves ovate, petioled; flowers terminating, six-stamined; stems prostrate. This differs from the preceding, in having the stems hexangular, and scattered over the neighbouring plants; the leaves ovate, smaller, and petioled. —Native of Guiana.

6. Spermacoce Prostrata; *Prostrate Buttonweed.* Smooth: leaves subsessile, elliptic, acute; flowers in whorls. Stem prostrate.—Native of Guiana, near rivers.

7. Spermacoce Radicans; *Rooting Buttonweed.* Smooth: leaves subsessile, lanceolate; flowers in whorls. Stem procumbent, rooting; flowers small and blueish. Perennial.—Native of Guiana, growing about the borders of rivers.

8. Spermacoce Longifolia; *Long-leaved Buttonweed.* Smooth: leaves lanceolate, acute at both ends, rugged at the edge; whorls halved. Stem four-cornered, smooth, purplish, even, ash-coloured at the top, with very short hairs visible only with the naked eye.—Native of Cayenne and Guiana.

9. Spermacoce Verticillata; *Whorl-flowered Buttonweed.* Smooth: leaves lanceolate; whorls globular. Stem rather herbaceous, only a little shrubby at the base, erect, a foot high. Browne says, that this little bushy plant is frequent in the low and hilly lands of Jamaica; that it branches very much, is adorned with many small leaves, and bears all its flowers at the upper joints of the branches. Swartz remarks, that when it is in flower, it smells like Melilot.—Seeds brought from near the river Gambia in Africa.

10. Spermacoce Sumatrensis; *Sumatra Buttonweed.* Hispid: leaves lanceolate; corymbs terminating, dichotomous. Stem herbaceous, four-cornered, tomentose, with long joints. —Found in Sumatra by Wennerberg.

11. Spermacoce Aspera; *Rough Buttonweed.* Leaves elliptic, very rugged, acute, smoothish; flowers axillary, clustered; stamina included. Stem herbaceous, erect, four-cornered, with the corners hairy and branched. Flowers several on each side in every axil.—Native of the West Indies.

12. Spermacoce Hirta; *Rough-haired Buttonweed.* Rugged, branched: leaves ovate-lanceolate; flowers clustered, axillary, sessile; stamina standing out. Stem herbaceous, from one to two feet high, four-cornered, stiff, striated; flowers small, white. Annual.—Native of the West Indies.

13. Spermacoce Villosa; *Villose Buttonweed.* Villose, simple: leaves ovate-lanceolate, pubescent, the uppermost in fours; flowers in whorls; stamina included. This is distinguished from the preceding species, by its more simple stem, and shorter stamina within the throat of the corolla, and by the whorls of white flowers. Annual.—Native of Jamaica.

14. Spermacoce Hispida; *Shaggy Buttonweed.* Hispid: leaves obovate, oblique. Root-annual; stem herbaceous, erect, obscurely four-cornered, opposite; lower branches opposite; corolla violet-coloured.—Native of Ceylon and the East Indies.

15. Spermacoce Scabra; *Rugged Buttonweed.* Leaves roundish; with the stem hispid, rugged; flowers in whorls; stamina standing out.—Native of India.

16. Spermacoce Articularis; *Jointed Buttonweed.* Leaves elliptic, bluntish, somewhat rugged. Root annual; stem herbaceous, red, round, channelled on every side; flowers white, narrow.—Native of the East Indies.

17. Spermacoce Stricta; *Stiff Buttonweed.* Leaves linear-lanceolate, marked with lines. Root annual; flowers white, in narrow whorls.—Native of the East Indies.

18. Spermacoce Linifolia; *Flax-leaved Buttonweed.* Leaves linear-lanceolate, villose, even, the uppermost in fours; flowers in whorls; stamina standing out. Stem herbaceous, four-cornered, somewhat villose, especially at the corners, ash-coloured at the tip.—Native of Cayenne.

19. Spermacoce Procumbens; *Procumbent Buttonweed.* Procumbent: leaves linear; corymbs lateral, peduncled. Stems herbaceous, angular, weak, diffused; flowers in bundles, or in a simple umbel.—Native of the East Indies.

20. Spermacoce Spinosa; *Thorny Buttonweed.* Suffruticose: leaves linear, ciliate, with spinules. Stem herbaceous, almost simple, subdivided at the base, hard, leafy, four-cornered, rugged, a foot high; flowers numerous, white, gathered into compact axillary heads, that grow gradually larger and more distinct as they draw nearer to the top.—Native of Jamaica.

21. Spermacoce Glabra. Stem procumbent, glabrous; leaves ovate-lanceolate, glabrous; flowers verticillate, white; seeds glabrous.—Grows on the banks of rivers, in most of the western territories of North America.

22. Spermacoce Diodina. Stem diffuse, rough; leaves linear lanceolate, slightly glabrous; margin and keel serrulate-scabrous; stipules multisetous at great length; flowers axillary, sessile, solitary, alternate, white, very small; seeds rough.—Grows in dry barren soil, on iron-ore hills, from Virginia to Carolina.

23. Spermacoce Involucrata. Stem alternate; branches very hispid; leaves ovate-lanceolate, acuminate, rough; stipules multisetous; heads terminal, involucrate; stamina standing out; flowers white, with a very long tube.—Grows to about the height of a foot, and is found in Carolina.

Sphæranthus; a genus of the class Syngenesia, order Polygamia Segregata.—Generic Character. *Calix:* common globular, imbricate; scales acuminate, permanent, clothing the universal receptacle all round; perianth partial many-flowered, five-leaved, within each scale of the common calix, solitary, composed of linear, equal, erect leaflets. *Corolla:* partial, corollets hermaphrodite, few in the disk; females in the ray commonly five: proper of the hermaphrodite one-petalled, funnel-shaped, with a five-cleft patulous border; female, awl-shaped, tubular, with a very small, trifid, closed mouth. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindric, tubular, longer than the corolla. *Pistil:* in the hermaphrodites, germen shrivelled; style longer, thicker; stigma quite simple. In the females; germen oblong; style bristle-shaped, length of the stamina; stigma two-parted. *Pericarp:* none; the calix unchanged. *Seeds:* in the hermaphrodites none; in the females solitary, oblong, naked. *Receptacle:* common scaly; partial naked. Essential Character. *Calix:* eight-flowered. *Corolla:* tubular, hermaphrodite, and indistinctly female. *Receptacle:* scaly. *Down:* none.—— The species are,

1. Sphæranthus Indicus; *Indian Sphæranthus.* Leaves decurrent, lanceolate, serrate; peduncles curled. Stem herbaceous, about a foot high; flowers solitary, terminal, globular, of a blue or purplish colour. It flowers from August to December. Perennial.—Native of the East Indies. Sow

the seeds in a hot-bed in the spring; and keep the plants in a stove or glass-case, giving them as much air as possible in warm weather.

2. Sphæranthus Africanus; *African Sphæranthus.* Leaves decurrent, ovate, serrate; peduncles round. Stem herbaceous, about a foot high; leaves alternate; peduncles sustaining three or four globular heads of flowers of a pale yellow colour.—Native of India.

3. Sphæranthus Chinensis. Leaves sessile, pinnatifid.—Native of India.

4. Sphæranthus Cochin-chinensis. Leaves decurrent, oblong, quite entire; heads of flowers cordate-ovate, subsessile, terminating. Stem herbaceous, a foot and half high, upright, round, smooth, whitish; flowers whitish, tinged with a little purple, in small solitary heads on short peduncles.—Native of China and Cochin-china, among the corn and in gardens. They use it chiefly in cataplasms, to resolve tumors in the breast; the expressed juice in ophthalmia; and the decoction internally, as a gargle for inflamed jaws.

Sphæria; a genus of the class Cryptogamia, order Fungi. Essential Character. Capsules roundish, immersed, filled with jelly, which becomes a mass of minute volatile seeds. Persoon enumerates 184 species, distributed in eight sections; and to his work the reader is referred.

Sphærocarpus; a genus of the class Cryptogamia, order Algæ, or more probably Hepaticæ. Essential Character. *Calix:* inferior, of one leaf, inflated, entire. *Seeds:* very numerous, collected into a globe at the bottom of the calix.——The only known species is,

1. Sphærocarpus Terrestris; *Reticulated Sphærocarpus.* Fronds simple, ovate or roundish, crowded, wavy, each attached by a fibrous, probably annual root.—Observed in the turnip and clover fields of Norfolk, in winter, especially on strong land, in patches of a pale glaucous green.

Sphagnum; a genus of the class Cryptogamia, order Musci. Essential Character. *Capsule:* sessile, without a fringe. *Veil:* cut round, its base remaining on the base of the capsule. *Antheræ:* each surrounded with a ring. *Observe.* Weber and Mohr have justly remarked, that it is the only known genus of Mosses in which the germen and capsule are truly sessile, not at any stage of growth elevated on a pedicellus, or partial stalk, above the base of the flower. The whole flower indeed, and consequently the ripe capsule, is stalked, which being rarely the case with other Mosses, whose pedicels are very long, the two different kinds of stalks have been confounded together.——The known species are,

1. Sphagnum Latifolium; *Broad-leaved Bog Moss.* Branches tumid, deflexed; leaves ovate, obtuse, concave.—Found on watery turfy bogs throughout Europe.

2. Sphagnum Squarrosum; *Prominent-leaved Bog Moss.* Branches deflexed, tapering; leaves ovate, acute, with recurved, prominent, keeled points.—Native of Germany, Sweden, and England. Found on bogs in Belton near Yarmouth, fruiting in June and July.

3. Sphagnum Capillifolium; *Slender Bog Moss.* Branches slender, deflexed; leaves ovate-lanceolate, pointed, flattish, close-pressed, with straight points.—Abundant on bogs in mountainous places.

4. Sphagnum Cuspidatum; *Long-leaved Floating Bog Moss.* Branches spreading rather downwards; leaves lanceolate, long pointed, wavy, lax.—Found in pools and rivulets among bogs in mountainous situations. Observed near Yarmoth, bearing fruit in summer.

Spider Orchis. See *Ophrys.*

Spiderwort. See *Anthericum* and *Tradescantkia.*

Spielmannia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, erect, short, permanent; segments linear-subulate, acute, almost equal. *Corolla:* one-petalled, salver-shaped; tube cylindric, incurved, globular at the base, villose within, the mouth inclosed with hairs; border five-cleft; almost equal; segments oblong, truncate, flat, spreading very much. *Stamina:* filamenta four, very short, in the tube of the corolla, two a little higher than the others; antheræ oval. *Pistil:* germen roundish; style short, permanent; stigma hooked. *Pericarp:* drupe globular, one-celled, succulent. *Seed:* nut globular-depressed, wrinkled, striated and tubercled longitudinally, two-celled; kernels solitary, oblong, more gibbous towards the outside, tuberculated and striated longitudinally, each fastened to a fleshy aril, gibbous on one side, hollowed on the other, adhering to the partition. Essential Character. *Calix:* five-cleft. *Corolla:* bearded at the throat, with a five-cleft almost equal border. *Drupe:* with a two-celled tuberculated nut.——The only known species is,

1. Spielmannia Africana; *Ilex-leaved Spielmannia,* or *Lantana.* This rises with a shrubby stalk five or six feet high, sending out many irregular branches, closely garnished with thin oval leaves, ending in points, serrate and embracing. From the bosom of each leaf comes out one solitary white flower, which is cut at the top into five parts, and at first sight has the appearance of a Jasmine flower. The flowers appear from February to November.—Native of the Cape, flowering from February to November. The plants are easily propagated by cuttings, which, if planted upon an old hot-bed any time in July, and covered with a bell or hand glass, and shaded from the sun, will put out roots in a month or five weeks; then they may be planted in pots, and placed in the shade until they have taken fresh root: after which they may be removed to a sheltered situation, where they may remain till the frosts come on. It is not very tender, and may be preserved in a good green-house in winter; but during that season it must have a large share of air in mild weather, or it is liable to grow mouldy, and this will cause the tender branches to decay. In the summer it may be exposed in the open air, with other green-house plants, in a sheltered situation, where it will add to the variety; and although the flowers are small, and produced singly from between the leaves, so do not make any great appearance, yet as there is a succession of them most part of the year, and the leaves continue green, it is worthy of a place in every good collection.

Spigelia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, acuminate, small, permanent. *Corolla:* one-petalled, funnel-shaped; tube much longer than the calix, narrowed below; border spreading, five-cleft; segments wide, acuminate. *Stamina:* filamenta five, simple; antheræ simple. *Pistil:* germen composed of two globes, superior; style one, awl-shaped, length of the tube; stigma simple. *Pericarp:* capsule twin, two-celled, four-valved. *Seeds:* numerous, very small. Essential Character. *Corolla:* funnel-shaped. *Capsule:* twin, two-celled, many-seeded.——The species are,

1. Spigelia Anthelmia; *Annual Worm-grass.* Stem herbaceous; uppermost leaves in fours. Root annual, fibrous; stem eighteen inches high; leaves opposite; flowers in short herbaceous clustered spikes, ranged on one side of the footstalk.—Native of the West Indies and South America. This plant has been long in use among Negroes and Indians, and takes its names from its peculiar efficacy in destroying worms, which Dr. Browne, from a number of successful experiments, asserts it does in so extraordinary a manner, that no other simple can be of equal efficacy in any other

disease, as this is in those that proceed from worms, when attended with fever or convulsions. Take of the plant, roots and all, either fresh or dry, two moderate handfuls, and boil them over a gentle fire, in two quarts of water, until one half of the liquid is consumed; then strain off the remainder, and add a little sugar and lemon-juice, to give it a more agreeable taste, and to keep it from growing viscid or ropy. To a full-grown person give half a pint at the hour of rest, and a proportionate quantity to all weaker and younger subjects. Repeat the dose once in twenty-four hours for two or three days after. But as the largeness of this dose may render its operation too violent, the following method is less hazardous, and as effectual: Give about four ounces to a full-grown person for the first dose, and two or three ounces every six hours after, if its anodyne quality will permit; but to persons of a delicate constitution, it should be repeated only every ten or twelve hours: this is to be continued for thirty-six or forty-eight hours, when the double dose may be again repeated, and after this takes its full effect, it must be worked off with some gentle purgatives. This medicine procures sleep almost as certainly, and in an equal degree, with opium; but the eyes seem distended, and appear bright and sparkling, as they generally do before the eruption of the small-pox and measles, after the sleepy effects are over. In a short time after the first dose is administered, the pulse grows regular, and begins to rise; the fever cools; the convulsions, if any, abate; and the worms are generally discharged in great quantities, by the use of the subsequent purgatives, if not before: but when a few only are voided, and those alive, which seldom happens, the dose must be repeated, and then hardly ever fails to cure.—To propagate this plant, sow the seeds in pots filled with soft loamy earth in the autumn, and plunge them into the bark-bed, where they should remain till the spring, when they must be plunged into a fresh hot-bed. Afterwards plant them in several pots, shading them till they have taken root, and then treat them in the same way as other tender annual plants from the same countries, keeping them constantly in the hot-bed under cover, to perfect the seeds.

2. Spigelia Marilandica; *Perennial Worm-grass.* Stem four-cornered; all the leaves opposite. Root perennial, fibrous; stem herbaceous, erect, six or eight inches high, terminated by a short spike of flowers, which are outside of a bright red, and the inside of a deep orange colour. It flowers here in July and August.—Native of the warmer parts of North America, as in Virginia, Maryland, and Carolina, where it is called *Indian Pink.* The accounts of the vermifuge virtues of this genus, given by Doctors Garden and Linnings, refer to this species; and as the efficacy resides principally in the root, which in the preceding is but small, this is by some thought to be preferable. Dr. Garden, in his first letter to Dr. Hope, about the year 1763, says, "About forty years ago, the anthelminthic virtues of the root of this plant were discovered by the Cherokee Indians; since which time it has been much used by physicians and planters. I never found it do much service, except when it proved gently purgative. Previous to the use of it, I have lately given a vomit, when the circumstances of the case permitted it, and have found it to answer so well, that it should never be omitted. I have known half a drachm of this root purge as briskly as the same quantity of rhubarb; but at other times it has produced no such effect in larger quantities. It is in general safer to give it in larger doses; for giddiness, dimness of sight, and convulsions, frequently result from small ones, whereas large ones only prove emetic or violently cathartic. To a child of two years of age, who had been taking ten grains of the root twice a day, without any other effect than making her dull and giddy, I prescribed twenty-two grains morning and evening, which purged her briskly, and brought away five large worms. After some months, an increased dose had the same good effects. Of the root, properly dried, I give from twelve to sixty or seventy grains in substance. In infusion, it may be given to the quantity of two, three, or four drachms twice a day." In subsequent letters, the same medical gentleman confirms the above statements of the efficacy of this root in worm cases. In what he terms continued or remitting low fevers, he found its efficacy promoted by the addition of the root of Serpentaria Virginica.—It is not easily propagated in England, for the seeds do not ripen here, and the roots increase slowly: hence the plant is very uncommon in the English gardens at present. It delights in a moist soil, and must not be often transplanted.

Spignel. See *Æthusa* and *Athamanta.*

Spikenard. See *Andropogon* and *Nardus.*

Spikenard, Plowman's. See *Baccharis* and *Conyza.*

Spilanthus; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common subhemispherical, imbricate; scales lanceolate-linear, compact, in a double row. *Corolla:* compound uniform, tubular, conico-convex; corollets hermaphrodite, numerous, equal; proper one-petalled, funnel-shaped; border four or five cleft, reflexed. *Stamina:* filamenta four or five, capillary, very short; antheræ cylindric, tubular. *Pistil:* germen oblong, compressed; style filiform, length of the stamina; stigmas two, recurved. *Pericarp:* none; the calix unchanged. *Seeds:* solitary, oblong, compressed, flat. *Down:* membranaceous-margined, two-awned at the tip, one awn often smaller than the other. *Receptacle:* chaffy, conical; chaffs compressed, deciduous. Essential Character. *Calix:* almost equal. *Down:* two-awned. *Receptacle:* conical, chaffy.——The species are,

1. Spilanthus Urens; *Biting Spilanthus.* Leaves lanceolate, quite entire; stem prostrate. Root perennial, fibrous; peduncles one-flowered, solitary, suberect, together with their branchlet, long, subterminating, bearing a whitish scentless flower, variegated with black dots, which proceed from the antheræ shedding their dark pollen over the corolla: after the flower is perfectly opened, from the side of the peduncle at the base, a new leafy stemlet springs forth, which in time produces its flower. It flowers from May to October.—Native of America, about Carthagena, in sandy fields. Sow the seeds upon a moderate hot-bed in the spring; and when the plants are fit to remove, transplant them into a fresh hot-bed, shading them till they have taken new root, and then treating them as other tender plants, being careful not to draw them up too weak. In June take them up with balls of earth to their roots, and plant them in a warm border, shading and watering them: several of them may be kept through the winter in a stove.

2. Spilanthus Pseudo-Acmella; *Spear-leaved Spilanthus.* Leaves lanceolate, serrate; stem erect. Branches opposite; flower, together with the calix, ovate, yellow, without any ray. It flowers in July. Annual.—Native of Ceylon.

3. Spilanthus Albus; *White-flowered Spilanthus.* Leaves ovate, almost entire, lower alternate, upper opposite; stem panicled; root annual, fibrous, whitish, exciting salvia; flowers terminating, solitary, erect, conical, obtuse, white; they appear in June and July.—Native of Peru.

4. Spilanthus Acmella; *Balm-leaved Spilanthus.* Leaves ovate, serrate; stem erect; flowers radiate. It is difficult to distinguish this from the second species, so great is the resemblance. Stalks two feet high, much branched. The pedun-

cles are very long, and support one yellow flower with very short rays. There is a succession of flowers from July till the frost puts a stop to them.—Native of Ceylon and the East Indies; where it is reputed to be a specific in the stone.

5. Spilanthus Tinctorius; *Dyer's Spilanthus.* Leaves lanceolate, serrate, smooth; peduncles many-flowered, terminating; stem diffused, herbaceous, three feet high, round, with a creeping root; flowers whitish-blue; seeds three-awned. —It is cultivated for dyeing, both in China and Cochin-china. The leaves when bruised yield an excellent blue colour; and a green, prepared by a method more easy than from Indigo, and by no means inferior in brightness.

6. Spilanthus Uliginosus; *Boggy Spilanthus.* Leaves ovate-lanceolate, crenate; stem erect, dichotomous; peduncles terminating; flowers radiate.—Native of Jamaica.

7. Spilanthus Atriplicifolius; *Orache-leaved Spilanthus.* Leaves alternate, deltoid, toothed, petioled, stipuled; stem panicled.—Native of South America.

8. Spilanthus Insipidus. Leaves obovate, somewhat toothed, sessile. Stems shrubby, round, branched, procumbent. It flowers in December and January.—Native of America.

9. Spilanthus Oleraceus; *Esculent Spilanthus.* Leaves subcordate, serrulate, petioled; stems procumbent, a foot long, round, somewhat rugged; flowers solitary, on long peduncles, yellow. It flowers from July to November.—Native of the East Indies.

Spinacia; a genus of the class Dicœcia, order Pentandria. —Generic Character. *Male. Calix:* perianth five-parted; segments concave, oblong, obtuse. *Corolla:* none. *Stamina:* filamenta five, capillary, longer than the calix; antheræ oblong, twin. *Female. Calix:* perianth one-leafed, four-cleft, acute, with two opposite segments, very small, permanent. *Corolla:* none. *Pistil:* germen round, compressed; styles four, capillary; stigmas simple. *Pericarp:* none: calix unites and hardens. *Seed:* one, roundish, covered by the calix. *Observe.* Fruit occasionally round, but generally two-horned, or four-horned. Essential Character. *Male. Calix:* five-parted. *Corolla:* none. *Female. Calix:* four-cleft. *Corolla:* none. *Styles:* four. *Seed:* solitary, within the hardened calix.——The species are,

1. Spinacia Oleracea; *Garden Spinach* or *Spinage.* Fruits sessile. Root annual; sheaves sagittate; stem hollow, branching, herbaceous, about two feet high. The male flowers are herbaceous, in long spikes; they abound in pollen, which when ripe flies out, if the plants be shaken, and spreads all round, after which they soon decay. The female flowers, which are on a separate plant, sit in clusters close to the stalks at every joint; they are succeeded by roundish seeds, which, in one variety, are armed with short acute spines, and in another without spines. The varieties of the garden spinach are two or three in number, and differ also in the size and shape of their leaves.—Much stress has been laid, by the opponents of the sexual system of plants, upon plants having been produced from the seeds of female Spinage, from which all male plants have been carefully separated: but they ought to have been aware, that it is by no means uncommon in this, and other dicœcious vegetables, to have some hermaphrodite flowers mixed among the females. The etimology of this well-known pot-herb is involved in much obscurity. Latin names terminating in *aca,* as Verbenaca, Portulaca, or in *acia,* as Spinacia, are deduced from something to which they are supposed to bear a resemblance, as Verbena, Portula, Spina; whence our English names Smallach and Spinach, not uncommonly spelt Smallage and Spinage.—The native place of its growth is unknown: the ancients do not mention it, but it has been long in use among the moderns. The Arabian physicians speak of it, and it has been known from time immemorial in Spain.—The juice of the leaves being diuretic, is sometimes serviceable in the gravel; and the leaves themselves, frequently eaten tend to prevent costiveness. The variety called Prickly Spinach, was formerly more cultivated in the English Gardens than at present, because it bears cold much better, and was therefore preferred for winter use.—*Propagation and Culture.* Sow the seeds upon an open spot of ground in the beginning of August, observing, if possible, to do it when there is an appearance of rain; for if the season should prove dry for a long time after the seed is sown, the plants will not come up regularly; part of them will come up soon, and the greater part not till refreshed by rain. As soon as the plants shew four leaves, the ground ought to be hoed to destroy the weeds, and also to cut up the plants where they are too close, leaving those which remain three or four inches asunder; but this should always be done in dry weather, that the weeds may be destroyed as soon as pulled up. About a month or five weeks after the first hoeing, the ground must be hoed again, also in dry weather; but in wet seasons it will be proper to hoe and gather all the weeds, in order to carry them off the ground; for if the plants be not thoroughly weeded before winter, the weeds will stifle and rot them by their numbers. In October, the Spinach will be fit for use. Take off only the largest outer leaves, leaving those in the centre of the plants to grow larger; and continue thus to crop it all the winter and spring, until the young Spinach, sown in the spring, becomes large enough for use, which is generally in April, when the winter plants will run up to seed, and should therefore all be cut, except what may be wanted to furnish seeds for sowing. If the ground in which the Winter Spinach is sown, be planted with early Cabbages, it is not proper to let any of the Spinach remain there for seed, and on that account should be cleared off as soon as ever the Spring Spinach is fit for use, that the Cabbages may be earthed up and laid clear, which is of great service to them: hence it will be well to sow a small spot of ground with this sort of seed, where there should be no other plants among it.—Smooth-seeded or Round-leaved Spinach is sown in the spring, upon an open spot of ground, separate, or else mixed with Radish seed, as is the common practice of the London gardeners, who always endeavour to extract as many crops in a season as possible from their land; but in the country where land is cheap, it will be the best method to sow it alone; and when the plants are come up, the ground should be hoed, to destroy the weeds, and cut out the plants where too close, leaving them about three inches asunder. When these have grown so large as to meet, cut out a part for use, thinning them where room is wanted, that they may spread. This may be done twice, as the herb is wanted; and at the last time the roots should be left eight or ten inches asunder, and the ground ought then to be hoed over again to destroy the weeds, which will be of great service to the plants: for if they be sown upon good land, the sort with broad thick leaves, generally called Plantain Spinach, will, with this weeding and management, often produce leaves as large as the Broad-leaved Dock, and prove very fine for the table.—In order to have a succession of this pot-herb through the season, sow the seeds at three or four different times in the spring, first in January, on a dry soil; next in the beginning of February, in a moist soil; third on a moist soil, at the beginning of March; and lastly, at the beginning of April. These late sowings should be hoed out thinner at the first time than either of the former, for there will be no necessity for leaving it for cutting out thin for use, because the former sowings will be sufficient to supply the table till

these are full grown; besides, by leaving it thin at first, it will not be apt to run up to seed, so soon as it would if the plants were close. The sowings here directed, are those practised by the kitchen-gardeners near London; but as Spinach is much used in soups for great tables, there should be some seeds sown every three weeks during the summer season, to supply the kitchen; but these late sowings should be on moist strong ground, or, if the season turn out hot and dry, it will run to seed before the plants obtain strength, especially if the plants be close together. In order to secure seeds of either of these kinds, you should sow an open rich spot of ground with the sort you intend, in February, after the danger of being injured by frost is over; and when the plants are come up, they should be hoed out to six or eight inches' distance, observing to cut down the weeds at the same time; and when the plants have grown about three weeks or a month longer, they should be hoed a second time, and left at least a foot asunder. Take care to keep them free from weeds, which force them up weak, and greatly injure the plants. When the plants have run up to flower, two sorts will be readily distinguished. The male will produce spikes of stamineous flowers, which contain the farina, and are absolutely necessary to impregnate the embryos of the female plants, in order to render the seeds prolific. These male plants are, by the gardeners, commonly called She-Spinach, and are often, by the ignorant, pulled up as soon as they are distinguished from the female, in order, as they pretend, to give room for the seed being spread; but wherever the male plants are entirely removed before the farina is shed over the female plants, the seeds which the latter produce will not grow, and hence it is absolutely necessary to leave a few of the male plants in every part of the ground; for a small number, properly selected, will be sufficient to impregnate the females, as the farina, when ripe, spreads to a considerable distance, whenever the plants are shaken by the wind. When the seeds are ripe, which may be known by their changing colour, and beginning to scatter, the plants should be drawn up, and spread abroad for a few days to dry; observing to turn them every other day, to dry the seeds equally on both sides, and also to guard them from birds, which would soon devour them. When the plants are dried, thresh out the seeds, free them from dirt, and lay them up where mice, who are extremely fond of them, cannot penetrate.

2. Spinacia Fera; *Wild Spinach*, or *Spinage*. Fruits peduncled. Root annual, whitish; stem about two feet high, smooth, erect, branched; leaves deltoid, ovate, sometimes sinuate, obtuse, petioled.—Native of Siberia, in damp, unfrequented places.

Spindle Tree. See *Euonymus*.

Spinifex; a genus of the class Polygamia, order Diœcia.—GENERIC CHARACTER. *Hermaphrodite Flowers. Calix:* head terminating, composed of several bundles, involucred; bundles partial, approximating, involucred, in each a rachis, solitary, awl-shaped, excavated a little above the base, flower-bearing, the rest naked, and others similar without flowers; involucre common two-leaved; leaflets lanceolate, channelled, subulate, mucronate, unequal; proper four-leaved, similar; glume one-flowered, two-valved; valves lanceolate, awl-shaped at the top, unequal; outer longer, inner concealed within an excavation of the rachis. *Corolla:* glume two-valved; valves lanceolate, convoluted; inner involving the organs of fructification. *Stamina:* filamenta three, filiform; antheræ linear, long, cloven at both ends. *Pistil:* germen oblong; styles two, filiform, longer than the glumes; stigmas villose, standing out. *Pericarp:* none; the calix unchanged, growing to the seed. *Seed:* one, oblong, smooth. *Male Flowers. Calix:* head as in the hermaphrodite; bundles involucred, with glumes longer, dagger-pointed, pungent; rachis, each subtrigonal, flowering almost from top to bottom; flowers from five to seven, sessile, alternate, bifarious, parallel, ovate, oblong, awnless; glume two-flowered, two-valved; valves oblong, obtuse, striated, channelled, shorter than the corolla, unequal, outer shorter; one floscule hermaphrodite, barren. *Corolla:* glume two-valved; valves lanceolate, channelled, convolute, inner narrower; nectary of two valves, linear, membranaceous, loose, diaphanous, short. *Stamina:* filamenta three, filiform; antheræ linear, long, cloven at both ends, standing out. *Pistil:* (in one floscule) germen oblong; style bifid; stigmas none. *Observe.* This genus differs from *Lolium*, in having two valves to the calix; and from *Triticum*, in their not being transverse. ESSENTIAL CHARACTER. *Hermaphrodite. Calix:* glume two-valved, two-flowered; valves parallel to the rachis. *Corolla:* two-valved, awnless. *Stamina:* three. *Styles:* two. *Male. Calix:* common with the hermaphrodite. *Corolla* and *Stamina:* similar.——The species are,

1. Spinifex Squarrosus. Leaves grassy, convolute, recurved, spreading, rigid, spiny at the end; sheaths widened, striated, with a woody ligule; culms very large, as thick as the finger, glaucous, as is the whole plant, jointed, with heaps of leaves at every joint, even, not hollow but full. Each spike nearly a finger's length, with a three-sided rachis, ending in a spine, and five alternate, lateral, sessile, remote flowers.—Native of the East Indies, China, and Cochin-china, on the sandy coasts.

2. Spinifex Longifolius; 3. S. Fragilis; 4. S. Sericeus; and, 5. S. Hirsutus, all natives of New Holland.

Spiræa; a genus of the class Icosandria, order Pentagynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-cleft, flat at the base; with acute segments, permanent. *Corolla:* petals five, inserted into the calix, oblong, rounded. *Stamina:* filamenta more than twenty, filiform, shorter than the corolla, inserted into the calix; antheræ roundish. *Pistil:* germina five or more; styles as many, filiform, length of the stamina; stigmas headed. *Pericarp:* capsules oblong, acuminate, compressed, two-valved. *Seeds:* few, acuminate, small, fastened to the internal suture. *Observe.* The thirteenth species is trigynous; the fifteenth differs from the rest in being diœcious; the sixteenth has numerous capsules in a ring; and the seventeenth has numerous capsules contorted, as in Helicteres. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Petals:* five. *Capsule:* many-seeded. The shrubby sorts may all be propagated by *suckers*, which are plentifully sent forth from the stems of the old plants in general; also by *laying down the tender branches*, which, when rooted, should be transplanted out in rows at three feet distance, and two feet asunder. In this nursery they may remain two years, observing to keep the ground free from weeds, and in the spring to dig it up between the rows, that the roots may the more easily extend themselves; but the suckers, if they put out any, should be taken off. Afterwards, they may be transplanted where they are to remain among other flowering shrubs, observing to place them among the shrubs of equal growth. For *layers*, the branches must be laid down in autumn, and in one year they will take root. These shrubs require no other pruning, but to cut out all the dead branches and such as grow irregularly, and to take off the suckers every year, otherwise the suckers will starve the plants. The ground between them should be dug every spring, and every third year rotten dung should be added; the first will assist their root, and the last will make them flower strong.——The species are,

** Stem Shrubby.*

1. Spiræa Lævigata; *Smooth-leaved Spiræa.* Leaves lanceolate, quite entire, sessile; racemes compound: shrubby, with round branches; flowers longer than the pedicel, white, alternate.—Native of Siberia, in valleys, at the foot of the loftier Altaic mountains, which are covered with snow. It flowers there in the spring, ripening its capsules at the beginning of August, and then flowering again from the lateral branches. The shoots being tough, straight, and of a proper size, are used by the Cossacks for ram-rods. The leaves are gently and pleasantly astringent, and may serve as a succedaneum for Tea. It flowers here from April to June.

2. Spiræa Salicifolia; *Willow-leaved Spiræa.* Leaves oblong, serrate, smooth; racemes decompounded. Four feet high, with smooth rod-like stems, and yellow branches; corollas of a rose-red colour, paler when expanded. On the banks of rivers it is often a fathom high, with longer leaves and large handsome racemes of flowers, as it appears in gardens; but on the rocky sides of mountains it is smaller and more branched, with shorter leaves, and a very short simple raceme.—It is found in Siberia, beginning from the river Obi, and thence becomes gradually more abundant about the Jenisca, and in the country beyond lake Baikal: it is sometimes found in the moist hedges of Westmoreland, and in many places on the borders of Winandermere; and also between Poolbridge and Colthouse, near Hawkshead in Cumberland; and in a wood at Hafod in Cardiganshire. There are several varieties; one with broad leaves, a native of North America.

3. Spiræa Callosa; *Callous Spiræa.* Leaves lanceolate, acute, serrate, subvillose; stem downy; panicle decompounded, subfastigiate. Flowers red; branches and branchlets alternate, roundish, villose, purplish, erect.—Native of Japan, flowering in June.

4. Spiræa Tomentosa; *Scarlet Spiræa.* Leaves lanceolate, unequally serrate, tomentose beneath; flowers doubly racemed: they are very small, and of a beautiful red colour, appearing in July, August, and September.—Native of Pennsylvania.

5. Spiræa Argentea; *Silvery-leaved Spiræa.* Leaves silky, wedge-shaped, marked with lines, serrate at the tip, and somewhat plaited; racemes compound; stalks slender, branching out near the ground.—Native of New Granada.

6. Spiræa Alpina; *Siberian Alpine Spiræa.* Leaves linear-lanceolate, toothletted, very smooth; corymbs lateral. Shoots a yard high; flowers white.—Native of Siberia.

7. Spiræa Hypericifolia; *Hypericum-leaved Spiræa.* Leaves obovate, quite entire; umbels sessile. The flowers are white: they appear in May and June, and being produced on almost the whole length of the branches, this shrub makes a good appearance during the time of flowering.—Native of North America, in dry swamps.

8. Spiræa Chamædrifolia; *Germander-leaved Spiræa.* Leaves obovate, gash-toothed at the tip; corymbs peduncled. Flowers biggish, white, fugacious, and having a weak virose smell; shoots abundant, seldom two ells high, the thickness of the finger, wand-like, branched; wood brittle. This species varies very much, especially with larger or smaller leaves, more or less cut, but more commonly quite entire and ovate-acute.—Native of Siberia, Hungary, Japan, and China. In Kamtschatka the leaves are used as a succedaneum for Tea; and they make tobacco-pipes of the straight shoots. This shrub makes beautiful hedges, being entirely covered with flowers in June. The capsules ripen in autumn; but it does not grow readily from seed; nor throw out suckers so readily as some of its congeners.

9. Spiræa Ulmifolia; *Elm-leaved Spiræa.* Leaves ovate, lanceolate, doubly toothed; corymbs peduncled. Flowers larger, and stem higher, than those of the preceding species.—Native of Carniola, and Siberia.

10. Spiræa Crenata; *Hawthorn-leaved Spiræa.* Leaves obovate, acute, toothed at the tip, three-nerved; corymbs clustered, peduncled. Stems several, scarcely two ells high, very much branched from the bottom; flowers smallish, white, odorous. Pallas says, this is the only plant of its genus that is indigenous of Russia, and that the leaves are so astringent as to tan leather. It flowers about the middle of May, ripening fruit in August.—Native of Spain, Hungary, Russia, and Japan.

11. Spiræa Triloba; *Three-lobed-leaved Spiræa.* Leaves roundish, subcordate, obtusely lobed, toothed; umbels peduncled. Flowers middle-sized, white; stems numerous, scarcely thicker than a swan's quill, very much branched. It multiplies very little by the root.—This elegant shrub is a native of Siberia, but is not found until we arrive at the Altaic chain of mountains; thence it continues eastward to the Jenisca and the lake Baikal, and seldom exceeds two feet.

12. Spiræa Thalictroides; *Meadow-rue-leaved Spiræa.* Leaves obovate, obtuse, subtrilobate; umbels lateral, sessile. Flowers white; branches straight.—This elegant species is a native of the transalpine parts of Dauria.

13. Spiræa Opulifolia; *Currant-leaved Spiræa.* Leaves ovate, three-lobed, serrate; corymbs peduncled. The flowers are produced in roundish bunches at the end of the branches; they are white, with some spots of a pale red. This species rises with many shrubby branching stalks, eight or ten feet high in good ground, but ordinarily five or six feet only. It is commonly known in the nurseries by the name of Virginian Guelder Rose.—Native of Canada and Virginia, on the banks of rivers.

14. Spiræa Sorbifolia; *Service-tree-leaved Spiræa.* Leaves pinnate; leaflets uniform, serrate; stem shrubby; flowers panicled, small, and white. This rises with shrubby stalks like the second species, but sends out horizontal branches, which are slender, and covered with a brown bark.—Native of Eastern Siberia, in boggy woods, wet valleys, and on the banks of torrents: it is abundant as far as Kamtschatka; and flowers at the beginning of July.

15. Spiræa Betulifolia; *Birch-leaved Spiræa.* Leaves wide-ovate, inciso-serrate, glabrous; corymbs terminal, compound, fastigiate, leafy; flowers tinged with red.—Grows to the height of about a foot, and is found in the mountains of Virginia.

16. Spiræa Capitata. Leaves ovate, sublobate, duplicate-dentate, tomentose; corymbs terminal, heaped together, subcapitate, peduncled at great length; calices tomentose.—Found on the north-west coast of North America.

17. Spiræa Discolor. Leaves ovate, lobed, dentated, subplicate; panicles terminal, peduncled, very branchy.—This shrub grows to the height of about five feet, and is found on the banks of the Kooskoosky.

*** Stem Herbaceous.*

18. Spiræa Aruncus; *Goat's-beard Spiræa.* Leaves superdecompound; spikes panicled; flowers diœcious. Root perennial; stem annual, from three to four feet high; flowers white, and feathery.—Native of Germany, Austria, Carniola, Dauphiny, Switzerland, Piedmont, Siberia, Japan, and Virginia. It flowers in June and July.

19. Spiræa Filipendula; *Common Dropwort.* Leaves interruptedly pinnate; leaflets uniform, serrate, smooth; stem herbaceous; flowers cymed, many-styled. Root perennial, consisting of oval tubers or solid lumps, hanging from the main body by threads; whence the common name. The tubers enable it to resist drought, and make it hard to be

eradicated.—Native of high chalky or gravelly pastures in England, and other parts of Europe, flowering in July. The whole herb is astringent. A decoction of the roots operates by urine, and brings away gravel. A tincture of it made in wine is good in epileptic fits and other disorders; and given in powder, it has been found serviceable in the whites, and also in the bloody flux. Hogs are fond of the roots. It is an elegant plant, very common in high pastures, on a calcareous soil, where it is sometimes very small. In gardens it often becomes very luxuriant, producing double flowers, which appear early in July; they are cream-coloured, often tipped with red, or red on the outside.

20. Spiræa Ulmaria; *Meadow-Sweet.* Leaves interruptedly pinnate, tomentose beneath, the end leaflet larger, lobed; flowers cymed, many-styled, white. Root perennial, fibrous stems erect, three or four feet high, angular and furrowed, tinged with red, leafy, branched in the upper part. It abounds in moist meadows, about the banks of rivers, brooks, and ditches, perfuming the air with the sweet Hawthorn-like scent of its plentiful blossoms, from June to August. The green parts of the herb partake of a similar aromatic flavour, when rubbed or chewed, approaching to the taste of Orange-flower water; a flavour possessed in higher perfection by the American Gualtheria. The flowers infused in boiling water give a fine flavour, which rises in distillation. Sheep and hogs eat the herb; goats are fond of it; and cattle generally refuse it. An infusion of the fresh-gathered tops of this plant promotes sweating, and has a small degree of astringency. It is an excellent medicine in fevers attended with purgings, and may be given to the quantity of a moderate bason-full once in two or three hours. It is likewise a good wound herb, whether taken inwardly, or externally applied. The flowers infused in any kind of liquors, impart a pleasant taste thereto, and, mixed with mead, give it the flavour of the Greek wines. A water distilled from them is good for inflammation of the eyes.—There is a variety with double flowers, and another with variegated leaves; both are to be found in some gardens.

21. Spiræa Digitata; *Finger-leaved Spiræa.* Leaves pinnate, tomentose beneath, the end one larger, seven-lobed, the lateral ones five-lobed; corymb branched, contracted. It has much of the habit, taste, and smell, of the preceding species.—Native of the eastern parts of Siberia, in meadows and moist valleys in the subalpine regions.

22. Spiræa Lobata; *Lobe-leaved Spiræa.* Leaves pinnate, smooth, the end one larger, seven-lobed, the lateral ones three-lobed; corymbs proliferous. Flowers red, in large clusters; root sweet-smelling.—Native of North America.

23. Spiræa Camtschatica; *Ear-petioled Spiræa.* Leaves five-lobed; petioles eared; stem hirsute; corymbs proliferous. Root thick, white, black on the outside; stems two or three, a fathom high or more, as thick as the finger or thumb at bottom; flowers a little larger than those of the Meadow-sweet, with white ovate petals. Willdenow remarks that the petiole is furnished above with roundish leafy appendages, and that it appears to be allied to the next species.—Native of Kamtschatka and Behring's Island.

24. Spiræa Palmata; *Hand-leaved Spiræa.* Leaves palmate, serrate; panicle superdecompound; stem herbaceous, striated, erect, wholly smooth. Flowers white or red, the latter with four styles.—Native of Japan.

25. Spiræa Trifoliata; *Three-leaved Spiræa.* Leaves ternate, serrate, almost equal; flowers subpanicled, on slender peduncles; petals long, lanceolate, spreading; stamina no longer than the tube of the flower. Root perennial; stalks annual, about a foot high, sending out side-branches the whole length. This is one of the most elegant species, and is a most desirable plant; it is by no means common, but rather scarce, and increases but little, being difficult to propagate, and liable to be wholly lost, except planted in a favourable soil and situation.—Found in shady woods, and on bogs, from Canada to Florida, flowering in June and July. Sow the seeds on a shady border soon after they are ripe; for if they are sown in spring, the plants will either never come up at all, or at best not till the year after. Remove them in autumn, when the leaves begin to decay, either where they are to remain, or into a nursery-bed, where they may grow a year or two to get strength. It delights in a shady situation, and a moist light soil. It is usually increased by parting the roots; which possibly might succeed as cuttings. The best situation, according to Mr. Curtis, is a north border, in a light bog or peat earth, or bog or peat mixed with hazel loam.

Splachnum; a genus of the class Cryptogamia, order Musci. Essential Character. *Capsule:* cylindrical, placed on a fleshy receptacle. *Fringe:* simple, of sixteen teeth, standing in pairs.—This genus is more remarkable than any of its tribe for size, beauty, and singularity. There are between twenty and thirty species, the most remarkable of which are: The Green Tapering Gland Moss: receptacle globular, green; leaves elliptic-lanceolate, bearded, entire; fruit-stalk capillary: is principally found in moist alpine situations in Wales and Scotland, growing on the dung of badgers and foxes. The Green Globular Gland Moss; found in Germany, Scotland, &c. The Purple Gland Moss; the most common species in England, growing chiefly on rotten cow-dung on moist turfy heaths in the spring. The Crimson Globular Gland Moss; found in the turfy bogs near Upsal in Sweden. The Red Umbrella Gland Moss; found in Norway, Sweden, Russia, and Siberia: and, the Yellow Umbrella Gland Moss, native of Lapland and Sweden.

Spleenwort. See *Asplenium*, *Blechnum*, and *Osmunda.*

Spondias; a genus of the class Decandria, order Pentagynia.—Generic Character. *Calix:* perianth one-leafed, subcampanulate, small, five-cleft, coloured, deciduous. *Corolla:* petals five, oblong, flat, spreading. *Stamina:* filamenta ten, awl-shaped, erect, shorter than the corollas, alternately longer; antheræ oblong. *Pistil:* germen ovate; styles five, short, distant, erect; stigmas obtuse. *Pericarp:* drupe oblong, large, marked with five dots from the falling of the styles, ten-valved. *Seed:* nut ovate, woody, fibrous, five-cornered, five-celled. Essential Character. *Calix:* five-toothed. *Corolla:* five-petalled. *Drupe:* with a five-celled nut.——The species are,

1. Spondias Mombin; *Purple Hog Plum*, or *Spanish Plum.* Leaves with the common petiole compressed. Browne describes this as a small spreading tree, which seldom rises above ten or twelve feet in height, with dark gloomy green foliage, which generally begins to shoot as the blossoms fall. It is cultivated by many for the sake of the fruit, which is rather pleasant, though not greatly esteemed in Jamaica, where superior fruits are very abundant. There is a variety called the *Leathercoat*, from the appearance of its skin; but the variation proceeds from the dry soil in which it is found. —Native of South America, whence it has been transplanted into the Caribbee islands; it is very common in St. Domingo, also in Jamaica, Curaçao, and St. Martin's, but scarce in most of the other islands.—Like the other plants of this genus, it grows easily from cuttings planted in pots filled with rich light earth, and plunged into a hot-bed, covering them down either with bell or hand glasses to exclude the external air, and shading them from the sun. The best time

for this is in the spring, before the plants put out their leaves. They may also be propagated by the stones, if brought over fresh. Put these into small pots filled with the same rich earth, and plunge them into a hot-bed of tanners' bark, observing duly to water the earth, and in six or seven weeks the plants will appear.

2. Spondias Myrobalanus; *Yellow Hog Plum*, or *Jamaica Plum*. Petioles round; leaflets shining, acuminate. This rises to the height of thirty feet or more, sending out many crooked irregular branches, which are destitute of leaves for some months. The flowers come out before the leaves appear, and are succeeded by yellow plums, an inch or more in length, growing in a sort of raceme; they have large fibrous stones, with a thin covering of flesh. The fruit is sometimes eaten by children; and is an excellent food for hogs.—Native of all the Caribbee Islands, and the neighbouring continent. As the branches or cuttings grow so readily, it is used by some for hedges; and a tree or two is frequently planted in pastures, to afford shade to the sheep. There is a variety with slightly pinnate leaves, which is much esteemed by some West India planters, and also by the wild hogs, whom it principally supplies with food.

3. Spondias Mangifera; *Mango Hog Plum*. Leaflets oblong, quite entire; panicle racemed; nut five-celled. Fruit oval, yellowish-green, eatable.—Native of the East Indies.

4. Spondias Dulcis; *Otaheite Apple*. Petioles round, six-paired; leaflets serrate, ribbed. This is a tall shady tree, with a handsome spreading head; trunk thicker than a man's body, upright, fifty feet high, flowering before the time of leafing, in September; branches diffused, spreading, round, with a brown rugged bark; flowers small, of a greenish yellow colour; drupe oval, obtuse, large, very smooth, of a golden colour, resembling an apple in flavour; outer shell very thin, dotted; pulp fleshy, succulent, sweet, aromatic, fragrant; nut hard, woody, ovate, echinate all over with hard pungent fibrils, five-celled, with membranaceous partitions. It is easily distinguished from the other species, by its peduncled shell and cells, removed both from each other, and from the axils.—Cultivated in the Society and Friendly Islands of the South Sea, especially in Otaheite. The golden fruit hangs in little nodding bunches, and is esteemed one of the most tasteful and wholesome; it has almost the same flavour with Ananas, and not only assuages thirst, but is given to the sick without distinction.

Spoonwort. See *Cochlearia*.

Spruce Fir. See *Pinus*.

Spurge. See *Euphorbia*.

Spurge-Laurel. See *Daphne*.

Spurrey. See *Spergula*.

Squash Gourd. See *Cucurbita*.

Squill. See *Scilla*.

Squirting Cucumber. See *Momordica*.

Stachys; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix*: perianth one-leafed, tubular, angular, half five-cleft, acuminate, permanent; toothlets acuminate, awl shaped, a little unequal. *Corolla*: one-petalled, ringent; tube very short; throat oblong, at the base gibbous downwards; upper lip erect, subovate, arched, often emarginate; lower lip larger, reflexed on the sides, trifid, the middle segment very large, emarginate, folded back. *Stamina*: filamenta four, two of them shorter, awl-shaped; when the antheræ have shed their pollen, curved back to the sides of the opening; antheræ simple. *Pistil*: germen four-parted; style filiform, situation and length of the stamina; stigma bifid, acute. *Pericarp*: none; the calix scarcely changed. *Seeds*: four, ovate, angular. Essential Character. *Calix*: five-cleft, awned. *Corolla*: upper lip arched; lower reflexed at the sides; the middle segment larger, emarginate. *Stamina*: finally reflexed towards the sides. Most of the species of this genus are hardy, and may be propagated by seeds sown in March, upon a bed of light fresh earth: when the plants come up, set them out into beds six inches asunder, watering them till they have taken root, and keeping them clear from weeds. At Michaelmas transplant them where they are to remain, in an open situation, and upon a dry and light, but not very rich soil. In the following summer these plants will flower, and in August their seeds will ripen; many of them die soon after. Some continue several years, and may be increased by parting the roots.——The species are,

1. Stachys Sylvatica; *Hedge Woundwort*, or *Hedge Nettle*. Whorls six-flowered; leaves cordate, petioled. Root perennial, creeping, but not very extensive; stems about two feet high, or from one to three feet high, upright, little branched, square, hairy, leafy; corolla of a deep blood-colour, prettily marbled about the orifice with a darker hue intermixed with white. This herb has a pungent fetid smell when rubbed, approaching to that of Black Horehound. Being one of those that powerfully affect the nerves, it might prove no contemptible stimulant, if judiciously used. Toads are thought to be fond of living under its shade. Sheep and goats eat it, but cows and hogs refuse it. The herb will dye yellow.—It is common in hedges, and shady places throughout Europe, flowering in July and August.

2. Stachys Circinata; *Blunt-leaved Stachys*. Whorls six-flowered; leaves cordate-rounded, crenate. Root perennial; stems several, decumbent at the base, and then ascending, scarcely a foot high, very hairy; corolla purple, with the upper lip pubescent. It flowers here from May to July.—Found in the mountains Zavans of Tunis.

3. Stachys Palustris; *Marsh Woundwort*. Whorls six-flowered; leaves linear-lanceolate, half embracing. Root perennial, creeping to a great extent, the extremities, at the close of summer, becoming tuberous; stems two feet high, upright, hollow, four-cornered, the sides flattish, the corners rough with hairs, pointing downwards; the joints also are hairy and purple; corolla pale reddish purple. If Linneus be accurate in stating that swine are fond of the roots, these animals might be turned into fields, where this plant abounds, with great advantage, after the crop has been removed; for it is a very noxious plant in many corn-fields, increasing much by its roots, and also by seed. Gerarde calls it *Clown's Woundwort*, because he was instructed by a clown to use it as a vulnerary; which he did with much success.—Native of Europe, in marshes, on the banks of rivers, in watery places, by road-sides, particularly in moist situations; flowering in July and August.

4. Stachys Alpina; *Alpine Stachys*. Whorls many-flowered; serratures of the leaves cartilaginous at the tip; corollas with a flat lip. Root perennial: colour of the plant dusky; colour of the corolla pale purple, with one blood-red line, running.—Native of Germany, Switzerland, Carniola, Italy, and the south of France. It flowers from June to August.

5. Stachys Germanica; *Downy Woundwort*. Whorls many-flowered; leaves crenate; stem woolly, erect; root perennial. The whole herb is remarkably invested with a white, soft, silky pubescence; corollas purple within, streaked about the mouth with white, their outside whitish and very downy. It flowers in July.—Native of Denmark, Germany, Switzerland, France, England, Austria, Carniola, Piedmont, and Siberia. It is found on the lime-stone soil of Oxfordshire, in corn-fields, and by the way-sides; between Blenheim and

Ditchley; near Witney, and Stonesfield; between Woodstock, Enstone, and at Brizenorton: it has also been found four miles south of Grantham, near the London road, opposite Easton; and on a hill two miles from Bedford.

6. Stachys Intermedia; *Oblong-leaved Stachys.* Whorls many-flowered; calices subspungent; leaves oblong, subcordate, crenate; stem somewhat woolly. Perennial, flowering in June and July.—Native of Carolina.

7. Stachys Lanata; *Woolly Stachys.* Whorls many-flowered; leaves woolly; stems procumbent and rooting at the base. Root perennial.—Native of Siberia.

8. Stachys Cretica; *Cretan Stachys.* Whorls thirty-flowered; calices pungent; stem rough-haired. It flowers from June to August. Perennial.—Native of Crete.

9. Stachys Patens; *Spreading Stachys.* Very much branched: branches filiform, spreading; leaves lanceolate, serrate, smooth; flowers subverticillate.—Native of Cuba.

10. Stachys Glutinosa; *Clammy Stachys.* Branches very much branched; leaves lanceolate, smooth. This is a little shrub, a foot high, clammy all over, with a strong bituminous scent; corolla villose on the outside.—Native of Candia.

11. Stachys Spinosa; *Thorny Stachys.* Branches terminated by a spine; stem very much branched; flowers on the extreme branchlets, axillary, solitary, or in threes, small, white, tipped with red.—Native of the western parts of Candia.

12. Stachys Orientalis; *Levant Stachys.* Leaves tomentose, ovate, lanceolate; floral leaves shorter than the whorl; stem very hairy; whorls remote, many-flowered; corolla yellow, with the upper lip very hirsute on the outside.—Native of the Levant.

13. Stachys Palestina; *Palestine Stachys.* Flowers subspiked; leaves lanceolate, sessile, tomentose, wrinkled, quite entire; calices awnless. Stems shrubby, round, white, tomentose; upper lip of the corolla concave, entire, purple, with a deeper purple line along the edge; lower lip also purple, spotted with white at the throat; middle lobe larger, concave; calix ten-cornered.—Native of Palestine and Greece.

14. Stachys Maritima; *Yellow* or *Sea Stachys.* Leaves cordate, obtuse, tomentose, crenate; bractes oblong, quite entire. Root perennial; stem suffruticose, a span high, erect, pubescent; corollas yellow. It flowers in July.—Native of sea-coasts on the south of Europe.

15. Stachys Æthiopica; *Cape Stachys.* Whorls two-flowered. Root perennial. The whole plant hairy; corolla incurved, three times as long as the calix; the upper lip villose on the outside, erect, arched, obovate, entire; stem a palm high, erect or diffused.—Native of the Cape.

16. Stachys Hirta; *Procumbent Stachys.* Whorls six-flowered; stems prostrate; upper lip of the corolla bifid, divaricate, reflexed. Root perennial. It flowers from June to August.—Native of Spain, Italy, the Levant, and Barbary.

17. Stachys Canariensis; *Canary Stachys.* Whorls six-flowered; leaves cordate, villose, crenate; stems almost erect; fruiting calices of a very spreading bell-shape. Root perennial, branched; corolla rose-purple; upper lip quite entire; disk of the lower lip, above the throat, dotted with purple.—Native of the Canaries.

18. Stachys Lavandulifolia; *Lavender-leaved Stachys.* Whorls six-flowered, very hirsute; leaves lanceolate, quite entire, marked with lines. Stem erect, a span high, simple, hirsute; corolla purple.—Native of the Levant.

19. Stachys Recta; *Upright Stachys.* Whorls subspiked; leaves cordate, elliptic, crenate, rugged; stems ascending; Root perennial; flowers yellow.—It flowers from June to August, and is a native of the south of Europe.

20. Stachys Arenaria; *Sand Stachys.* Whorls subspiked, six-flowered, villose; leaves lanceolate, obtuse, serrate; stems procumbent at the base. Root perennial; corolla purple, villose.—Native place not ascertained.

21. Stachys Annua; *White Annual Stachys.* Whorls six-flowered; leaves ovate-lanceolate, three-nerved, even, petioled; stem branched, erect. Root annual; corollas yellow. It flowers in July and August.—Native of Germany, Austria, Carniola, Switzerland, Piedmont, and France.

22. Stachys Rugosa; *Rough Stachys.* Whorls six-flowered; leaves lanceolate, attenuated at the base, tomentose, wrinkled, serrate; calices awnless. Shrubby, bushy, round, very white. It flowers in July.—Native of the Cape.

23. Stachys Arvensis; *Corn Stachys,* or *Woundwort.* Whorls six-flowered; leaves cordate, obtuse, crenate, somewhat hairy; stem weak, spreading. Root small, annual; corolla small, scarcely exceeding the calix, pale purple, or flesh-coloured. It flowers from July to August.—Common in the fields of Britain, and other parts of Europe, upon a gravelly or calcareous soil.

24. Stachys Latifolia; *Broad-leaved Stachys.* Whorls many-flowered, subspiked; upper lip bifid with the little segments, acute; leaves broad, cordate, wrinkled, hairy. Shrubby; flowering in June and July.—Native place uncertain.

25. Stachys Fœniculum. Plant erect, pubescent; leaves cordate-ovate, dentated, tomentose; whorls subsexflorous; flowers blue.—The whole of this plant has a scent very like that of Fennel, and was found by Pursh on the banks of the Missouri. It flowers in July.

Stæhelina; a genus of the class Syngenesia, order Polygamia Æqualis.—Generic Character. *Calix:* common oblong, cylindric, imbricate; scales lanceolate, erect, terminated by a shorter coloured scalelet. *Corolla:* compound uniform, tubular; corollets hermaphrodite, equal; proper one-petalled, funnel-form; border five-cleft, equal, acute, bell-shaped. *Stamina:* filamenta to each floret five, capillary; antheræ connate, tailed. *Pistil:* germen very short; style filiform; stigma double, oblong, obtuse, erect. *Pericarp:* none; calix unchanged. *Seeds:* solitary, oblong, very short, four-cornered; down branched or cloven, longer than the calix. *Receptacle:* chaffy, flat; chaffs very short, permanent. Essential Character. *Antheræ:* tailed. *Down:* branched. *Receptacle:* with very short chaffs.——The species are,

1. Stæhelina Gnaphalodes. Leaves filiform, tomentose; scales of the calix lanceolate, membranaceous at the tip, and reflexed. This rises with a shrubby stalk about three feet high, and divides into several branches; flowers terminating in single heads, which are pretty large, and have scaly calices ending in recurved spines; florets yellow.—Native of the Cape. Plant the cuttings in any of the summer months, covering them closely with a bell or hand glass. When they have made good roots, take them up carefully, and plant them in pots filled with fresh and light, but not very rich earth, and place them in the shade till they have taken new root; then remove them into a sheltered situation, and in autumn place them in the house. They do not require any artificial heat in winter, but should have a dry air, their tender shoots being very liable to rot with damp. This species does not always ripen its seeds in England.

2. Stæhelina Dubia. Leaves linear, toothletted; scales of the calix lanceolate; seed-down twice as long as the calices; flowers terminating. It flowers in July. Biennial.—Native of Spain, the south of France, and Italy. Sow the seeds upon a warm border of light ground in the spring, where the plants are designed to stand; for unless they are carefully transplanted when young, they do not bear removal well.

In the second year they will flower, and, if the season proves favourable, the seeds will ripen, and the plant decays soon after. This species will live through the winter in the open air, on a dry poor soil, and in a sheltered situation; but in rich ground it becomes luxuriant in summer, and is therefore more liable to suffer from the cold in winter.

3. Stæhelina Arborescens. Leaves petioled, elliptical, entire, silky beneath. Stem arborescent; root black, with long black fibres; flower terminating; corollas purple. In alpine situations it varies with a stem two feet high or more. —Native of the south of France, and of Candia.

4. Stæhelina Fruticosa. Leaves lanceolate, obtuse, smooth on both sides. Stem shrubby, with round, minutely roughish branches.—Native of the Levant.

5. Stæhelina Spinosa. Leaves awl-shaped, spinescent, with a spinule at the base on each side. Stem shrubby; flowers solitary at the end of the branches, with a pair of small leaflets at the base.—Native of Egypt.

6. Stæhelina Hastata. Leaves hastate, hoary; stem shrubby. This is a low, stiff, and very branching shrub; branches round, hoary, blunt.—Native of Egypt.

7. Stæhelina Ilicifolia. Leaves opposite, on very short petioles, cordate, toothed, shining above, tomentose beneath. Stem arborescent; florets numerous, yellow, funnel-shaped, five-cornered, smooth.—Native of New Grenada.

8. Stæhelina Corymbosa. Leaves wedge-shaped, præmorse; flowers corymbed; seed-down white, longer than the calix.—Native of the Cape.

9. Stæhelina Chamæpeuce. Leaves linear, clustered, very long, revolute.—Native of Candia.

10. Stæhelina Imbricata. Leaves awl-shaped, erect, tomentose.—Native of the Cape.

Staff Tree. See *Celastrus.*

Stapelia; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* perianth one-leafed, five-cleft, acute, small, permanent. *Corolla:* one-petalled, large, flat, thick, five-cleft beyond the middle; segments wide, flat, acuminate. Nectary five leaflets, spreading, linear, grooved, emarginate, with a dagger point, opposite to the segments of the corolla; leaflets five others, fastened, alternately with these, a little higher to the tube of the filamenta, and running along it, vertical, bifid; interior segments with the summit bent outwards; outer segments straight, compressed. *Stamina:* filamenta five, united into a short tube. Each anthera fastened internally to the base of each vertical leaflet of the nectary, and wider than it, incumbent on the stigma, short, two-lobed, two-celled, produced below both sides into an earlet, contiguous at the margin to each of the neighbouring antheræ as far as the tip, and ascending at the tip; pollen united into ten corpuscles, crescent-shaped, flattish, ascending obliquely into the cells of the anthera, each on a very short pedicel, (with a transverse base, incumbent on the upper margin of the earlet,) fastened by pairs to five small twin coloured tubercles, placed on the apex of the earlets, and adhering to the angles of the stigma. *Pistil:* germina two, ovate, flat inwards; styles none; stigma common to both germina, large, placed on the tube of the stamina, acutely five-cornered, flat above, obliquely truncate, excavated at the sides for the reception of the antheræ. *Pericarp:* follicles two, long, awl-shaped, one-celled, one-valved. *Seeds:* numerous, imbricate, compressed, crowned with a down. *Receptacle:* free. Essential Character. *Corolla:* one-petalled, five-cleft. *Nectary:* a double little star, covering the genitals. *Common Stigma:* pointless. *Follicles:* two, smooth. *Seeds:* comose. The plants of this genus are propagated here very easily during the summer months, by taking off any of the side-branches, which, when planted, put out roots very freely. The branches should be slipped off from the plants to the bottom, where being joined by a small ligature, they will not occasion a great wound, the joints at the place where they are connected being almost closed round; for if they are cut through the branch, the wound will be so great as to occasion their rotting when planted: these should be laid in a dry place under cover for eight or ten days, that the wounded part may dry and heal over, otherwise they will rot; then they should be planted in pots filled with fresh sandy earth, mixed with lime-rubbish and sea-sand; and if the pots are plunged into a very moderate hot-bed, it will promote their taking root: they should be now and then sprinkled with water, which ought to be sparingly given; and as soon as they take root, should be inured to the open air. If these plants are kept in a very moderate stove in winter, and in summer placed in an airy glass-case, where they may enjoy much free air, but be screened from wet and cold, they will thrive and flower very well; for though they will live in the open air in summer, and may be kept through the winter in a good green-house, yet those plants will not flower so well as those managed in the other way. They must have little water in winter.——The species are,

* *Corolla five-cleft; Segments hairy at the edge.*

1. Stapelia Ciliata; *Ciliate Stapelia.* Stem four-cornered, branched, decumbent, rooting, flowering at top; peduncles shorter than the corolla, which is papillose at bottom. This is distinguished from all the other species by its procumbent, branched, rooting stem.—Native of Southern Africa.

2. Stapelia Revoluta; *Revolute-flowered Stapelia.* Stem four-cornered, branched at the base, erect, flowering at top; peduncles shorter than the corolla, which is smooth, with the segments ovate, hairy at the edge, and revolute.—Native of Southern Africa, in dry fields under shrubs, flowering in September and October.

3. Stapelia Hirsuta; *Hairy Stapelia.* Branches ascending, four-cornered, flowering at the base; peduncles round, length of the corolla, which is villose at bottom, with the segments ovate, sharpish, and villose at the edge. Root composed of many strong fibres. The colour of the corolla is yellow, with transverse streaks of a dark violet colour; the segments violet at the end and along the edge; the bottom pale red, with red nectaries. Its scent is so like carrion, that flesh-flies lay their eggs upon it. It flowers in June and July.—Native of the Cape. This and the forty-second species were all that were cultivated in Mr. Miller's time; he never saw the pods of this produced here.

4. Stapelia Sororia. Branches divaricating, four-cornered, flowering at the base; peduncles round, longer than the corolla, which is very villose at bottom, and wrinkled transversely, with the segments oblong, acute, villose at the edge. The colour of the corolla is a dark purple, with transverse yellow wrinkles. Willdenow remarks, that it resembles the next species in colour, but that it is sufficiently distinct in the peduncle and stem.—Native of the Cape.

5. Stapelia Grandiflora; *Great-flowered Stapelia.* Branches erect, four-cornered, club-shaped, flowering at the base; peduncle thickened at the base, shorter than the corolla, which is villose, with the segments lanceolate, acuminate, ciliate at the edge.—Native of Southern Africa, in hot places, as at Sonday's river.

6. Stapelia Ambigua. Branches erect, four-cornered, club-shaped, flowering at the base; peduncles many-flowered; corollas hispid, with the segments ovate, lanceolate, acute, villose at the edge. It is sufficiently distinguished from the

STAPELIA HIRSUTA —

Hairy Stapelia, or Carrion Flower.

SPIRÆA TRIFOLIATA —

Common Three-leaved Spirœa.

H.Frederick sc.

Publish'd by Henry Fisher, Caxton, Liverpool. July, 1810.

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species most allied to it, by its many-flowered peduncles; colour of the corolla a dark red purple, variegated with short transverse wrinkles of an almost black purple, and have the edge of the segments of a dark violet colour.—Native of the dry deserts of Southern Africa.

7. Stapelia Pulvinata; *Cushion-flowered Stapelia.* Stem four-cornered, decumbent; branches ascending, flower-bearing; bottom of the corolla raised and villose; segments roundish, wrinkled, acuminate, villose at the edge; colour very dark purple, with whitish wrinkles.— Native of Southern Africa.

8. Stapelia Asterias; *Starry Stapelia.* Branches erect, four-cornered, attenuated, flowering at the base; peduncles length of the corolla, the segments of which are ovate, acuminate, wrinkled, revolute, and villose at the edge. The nectaries, or star, in the middle are white, the bottom is very dark purple.—Native of Africa.

9. Stapelia Gemmiflora; *Bud-flowering Stapelia.* Branches erect, four-cornered, flowering at bottom; peduncles length of the corolla, which is rugged, with the segments acute, ciliate at the edge, five-nerved above. It is of a dusky purple colour, or almost black, with small transverse stripes of a paler hue; the bottom is very dark, studded with minute yellow dots. It is sufficiently distinct from all the other species, in having the segments of the corolla five-nerved above, and the outside of it yellow dotted with purple; whereas, in the rest it is almost always pale and of one colour. —Native of dry places in Southern Africa.

10. Stapelia Divaricata; *Straddling Stapelia.* Branches four-cornered, attenuated, divaricate, spreading, flowering in the middle; peduncles longer than the corolla, which is smooth, with the segments lanceolate, acuminate, rolled back and ciliate at the edge, flesh-coloured. Habit slender, lax, and spreading.—Native of Southern Africa.

11. Stapelia Rufa. Branches four-cornered, erect, flowering at the base; peduncles shorter than the corolla, which is wrinkled and starred at the bottom, with the segments lanceolate, acuminate, ciliate at the edge, of a dark violet colour, variegated with transverse streaks of a very dark purple, with the bottom stellate and of an uniform rufous colour; nectaries variegated.—Native of Southern Africa.

12. Stapelia Acuminata. Branches four-cornered, ascending, flowering in the middle; peduncles shorter than the corolla, which is wrinkled, and the segments are ovate-cusp-acuminate, ciliated at the edge. It is a little larger than that of the preceding species, variegated with dark purple transverse waved streaks, very finely fringed with white at the edge.—Native of Southern Africa, in Namaqualand.

13. Stapelia Reclinata. Branches spreading, four-cornered, ascending, flowering above the base; peduncles longer than the corolla, which has a raised bottom with lanceolate segments, ciliate at the edge, of a dark purple colour.—Native of Africa.

14. Stapelia Elegans. Branches diffused, oblong, roundish, four-cornered, flowering in the middle; peduncles longer than the corolla, which is hispid with a pentagon bottom and lanceolate segments, ciliate at the edge. It is less than that of the preceding species, very dark violet, with a rufescent bottom and yellow nectaries.—Native of Southern Africa.

15. Stapelia Cæspitosa; *Tufted Stapelia.* Branches procumbent, four-cornered, flowering above the base; peduncles length of the corolla, the segments of which are lanceolate, acute, revolute, and ciliate at the edge; corolla five-cornered, recurved in the middle; segments spreading, narrowed, folded back, and ciliate; colour dark purple; size nearly that of the preceding, with the bottom circular, greenish, and the nectaries yellow —Native of Southern Africa.

16. Stapelia Arida; *Dry Stapelia.* Branches four-cornered, erect, flowering at the top; peduncles longer than the corolla, which has a circular bottom, and oblong acute segments, ciliate at the top of the margin.—Native of Southern Africa, in Kannaland.

17. Stapelia Parviflora; *Small-flowered Stapelia.* Branches four-cornered, spreading, flowering in the middle on the outside of the teeth; peduncles longer than the corolla, the segments of which are lanceolate, bluntish, and ciliate at the edge. The flowers are the smallest of the genus, not half an inch broad, yellow, hairy, on deflexed purple stalks, scarcely an inch in length; nectaries orange-coloured.—Native of Southern Africa, in Namaqualand.

18. Stapelia Subulata; *Awl-shaped Stapelia.* Branches four-cornered, attenuated, nodding, flowering below the top; corollas nodding; segments oblong, acuminate, cusped, with the hairs pointing one way.—Native of Arabia Felix.

19. Stapelia Concinnata; *Neat Stapelia.* Stem four-cornered, erect, branched at top; branches spreading, simple, flowering at the base; peduncles length of the corolla; corollas hispid, with the segments ovate, acute, ciliate. It is ash-coloured, with whitish bristles.—Native of Southern Africa.

20. Stapelia Glanduliflora; *Glandular-flowered Stapelia.* Branches spreading, four-cornered, flowering at the base; peduncles longer than the corolla, which is covered with hairs, glandular at the tip, with the segments ovate, acute. Stems green, erect, somewhat downy at the edges; flowers an inch broad, tawny, or yellowish, clothed with erect club-shaped glands, of very singular appearance.—Native of Southern Africa.

** *Corolla five-cleft; Segments smooth at the edge.*

21. Stapelia Pedunculata; *Long-peduncled Stapelia.* Branches four-cornered, two or three toothed at the tip, flowering in the middle; peduncles twice as long as the branches; segments of the corolla lanceolate, acuminate at the base, surrounded at the edge by pedicelled glands; colour purplish-brown, varying to yellow. This is very distinct from the rest in the length of the peduncle, and the structure of the flower and branches.—Native of Southern Africa, in Camies Berg.

22. Stapelia Aperta; *Open-flowered Stapelia.* Branches four-cornered, three or two toothed at the tip, flowering at the base; peduncles twice as long as the branches; corollas wrinkled; segments ovate, obtuse, smooth at the edge, of a dirty dusky-purple, wrinkled, with very short darker stains; bottom circular, ash-coloured, dotted with black. It resembles the preceding species in the peduncle and branches, but the flower is smaller and very different.—Native of Southern Africa.

23. Stapelia Gordoni; *Gordon's Stapelia.* Branches flowering at the top, round, tubercled; tubercles spiny. Stem erect, branched, a foot high, green, very thick, and obtuse, beset all over with blunt tubercles, each bearing a prominent thorn; peduncles shorter than the corolla, which is five-toothed, flat, and wheel-shaped; colour yellowish-brown, with a whitish centre and black nectaries.—Native of the Cape, towards Orange River.

24. Stapelia Pilifera; *Hairy-tubercled Stapelia.* Branches flowering at the top, round, tumid, with copious tubercles, each tipped with a bristle; flowers sessile; segments ovate, cusp-acuminate, smooth at the edge; corolla dark purple, with a small raised red circle in the middle surrounding the genitals. It is eaten by the Hottentots, who call it Guaap. —Native of Southern Africa, upon very dry hills.

25. Stapelia Caudata; *Tailed Stapelia.* Stem rough-haired, leafy; peduncles shorter than the corolla, drooping; segments of the corolla linear, acute.—Native of Southern Africa.

26. Stapelia Articulata; *Jointed Stapelia.* Branches flowering at the top, round tubercles; tubercles mucronate; flowers subsessile; corollas papillose; segments lanceolate. This is a low ferruginous plant. The Hottentots eat the stalks raw, and the Dutch pickled with vinegar.—Native of Southern Africa.

27. Stapelia Mammillaris; *Prickly Stapelia.* Branches flowering in the middle, erect, roundish, tubercled; tubercles spiny; peduncles shorter than the corolla, which is smooth, with the segments lanceolate.—Native of Southern Africa.

28. Stapelia Pruinosa; *Frosted Stapelia.* Branches erect, four-cornered, flowering in the middle; peduncles shorter than the flower; corollas pubescent; segments ovate-acute, covered with very small white hairs as if with hoar-frost.—Native of Africa.

29. Stapelia Ramosa; *Branched Stapelia.* Branches almost upright, four-cornered, flowering in the middle on the outside of the teeth; peduncles shorter than the flower; corollas flat; segments lanceolate, rolled back at the edge; colour dark purple. Plant a foot high or more.—Native of Southern Africa, beyond Platt Kloof.

30. Stapelia Pulla; *Black-flowered Stapelia.* Branches erect, subhexagonal, flowering in the middle on the outside of the teeth; peduncles shorter than the flowers; segments of the corolla erect, lanceolate-acuminate, rolled back at the edge. It is distinguished from the preceding species by its hexagonal, acuminate, toothed branches. The flowers are a little larger, growing several together, on short aggregate stalks, pale externally, but almost black on the upper surface of their segments.—Native of hot sandy deserts in Southern Africa.

31. Stapelia Adscendens; *East Indian Stapelia.* Stems four-cornered, ascending, flowering at the top; peduncles shorter than the corolla, which is smooth, with the segments linear, reflexed at the edge, and acute; flowers axillary, about the extremities of the branches, generally single, erect, small, variegated with dark purple and yellow.—Native of the East Indies, where it is not very common: it grows among bushes on high dry barren ground, flowering during the wet season. The natives eat the most succulent tender branches raw, although they have a salt and bitter taste.

32. Stapelia Quadrangula. Stem four-cornered; branches divaricating, flowering at the top; teeth truncate; flowers sessile, yellowish-green.—Native of Arabia Felix.

33. Stapelia Incarnata; *Flesh-coloured Stapelia.* Branches four-cornered, stiff, flowering at the top, on the outside of the teeth; peduncles shorter than the corolla; the segments of which are lanceolate, and acute; corolla flat, smooth, flesh-coloured, varying to white. The flowers are small. The tender branches are eaten by the Hottentots.—Native of Southern Africa, in dry sandy fields.

34. Stapelia Punctata; *Purple-dotted Stapelia.* Branches decumbent, oblong, somewhat four-cornered, flowering in the middle; peduncles twice as long as the corolla, which is bell-shaped, with the segments spreading, lanceolate, acute; corolla bluish-white, with purple dots.—Native of Southern Africa, in Namaqua land.

35. Stapelia Geminata. Branches decumbent, round, flowering at the top; peduncles geminate, length of the corolla; the segments of which are lanceolate, rolled back at the edge; corolla orange-coloured, with blood-red dots; divisions narrow, spreading, glandular.—This low plant is found in hot places under shrubs, in Southern Africa.

36. Stapelia Decora. Branches oblong, decumbent, round, obscurely four-cornered, flowering at the base; peduncles longer than the flower; bottom of the corolla five-cornered; segments ovate-lanceolate, rolled back at the edge; corolla yellow, mixed with black, narrowed, lanceolate, spreading, rugged above, rolled back at the edge. This is thought to be a variety of the preceding species.—Native of Southern Africa.

37. Stapelia Pulchella. Branches four-cornered, decumbent, flowering above the base; peduncles many-flowered; bottom of the corolla circular; segments ovate-acute. This is a smooth branching plant.—Native of Southern Africa.

38. Stapelia Vetula. Branches four-cornered, erect, flowering at the base; peduncles shorter than the corolla, which is smooth, with the segments ovate, acuminate, three-nerved above: colour dark purple.—Native of Southern Africa.

39. Stapelia Verrucosa; *Warty-flowered Stapelia.* Branches ascending, four-cornered, flowering at the base; peduncles longer than the corolla, which is warted, with the segments ovate and acute, the bottom five-cornered and rugged.—Native of Southern Africa.

40. Stapelia Irrorata. Branches from erect spreading, four-cornered, flowering at the base; peduncles longer than the corolla, which is wrinkled, with ovate-acuminate segments. It differs from the preceding, in having no warts or pentagon ring to the corolla; the branches from upright spreading; and the colour of the corolla sulphureous, with bloody dots, and a blood-red bottom.—Native of Southern Africa, in dry places, flowering in September and October.

41. Stapelia Mixta. Branches four-cornered, ascending, flowering at the base; peduncles length of the corolla, which is wrinkled, with a circular raised papillose bottom, and ovate-acuminate segments: it is of a dusky violet colour, wrinkled, with transverse yellow streaks, the bottom yellow, with red papillæ. This is so like the next species, that it might be taken for a variety: but it differs in the form of the toothlets on the branches; in the size of the flower, which is twice as large; and in the colour, and especially in the form of the nectary.—Native of Southern Africa.

42. Stapelia Variegata; *Variegated Stapelia.* Branches four-cornered, ascending, flowering at the base; peduncles longer than the corolla, which is wrinkled, with a circular, concave, wrinkled bottom, and ovate-acute segments. It is finely spotted with purple, and resembles the belly of a frog. The flower, when blown, has an odour like that of rotten cheese; and the common fly frequently deposits its eggs upon it. It flowers in June and July.—Native of Southern Africa, in the crevices of rocks.

** *Corolla ten-toothed.*

43. Stapelia Campanulata: *Bell-shaped Stapelia.* Branches erect, four-cornered, flowering at the base; peduncles three-flowered; segments of the corolla larger, lanceolate, with a bell-shaped bottom. This is sufficiently distinct from the following species; the corolla being spotted, not only within, but on the outside also: the bottom bell-shaped, and the peduncle many-flowered.—Native of Africa.

44. Stapelia Barbata. Branches mostly four-cornered, erect, flowering at the base; peduncles shorter than the corolla, which is bell-shaped, with the segments larger, lanceolate, acuminate, rugged, clubbed, and bearded.—Native of Southern Africa.

45. Stapelia Venusta. Stem four or five cornered, erect, branched at top; branches flowering at the base; peduncles longer than the corolla, bent down; corolla smooth; segments larger, ovate, acuminate; bottom concave, surrounded by an elevated ring. This differs from the rest, in having the stem erect, branched at top, and the peduncles hanging down.—Native of Southern Africa.

46. Stapelia Guttata. Branches somewhat spreading, and four-cornered, flowering at the base; peduncles length of the

corolla; the segments of which are large, ovate, acute; the bottom concave, rugged, surrounded by an elevated ring. The figure of the corolla as in the preceding, but the bottom rugged, and the stem different.—Native of Africa.

47. Stapelia Humilis. Branches four-cornered, spreading, flowering at the base; peduncles solitary, shorter than the corolla; the segments of which are larger, lanceolate, acute. It differs from the other ten-toothed species, in the shortness of the stem, the smallness of the flower, and the peduncles being invariably simple.—Native of Africa.

48. Stapelia Reticulata; *Netted Stapelia.* Branches five-cornered, spreading, flowering at the base; peduncles in pairs, shorter than the corolla, the segments of which are larger, ovate, acute, the bottom bearded, surrounded by an elevated ring; colour of the corolla dark purple, with white lines like the meshes of a net.—Native of Southern Africa, found in hollow rocks.

49. Stapelia Clavata; *Club-shaped Stapelia.* Stem simple, thick, club-shaped, nettedly and obscurely warted, flowering at the top.—Native of Southern Africa.

Staphylea; a genus of the class Pentandria, order Trigynia. —Generic Character. *Calix:* perianth five-parted, concave, roundish, coloured, almost as big as the corolla. *Corolla:* petals five, oblong, erect, like the segments of the calix; nectary from the receptacle of the fructification, in the bottom of the flower, concave, pitcher-shaped. *Stamina:* filamenta five, oblong, erect, length of the calix; antheræ simple. *Pistil:* germen thickish, three-parted; styles three, simple, a little longer than the stamina; stigmas obtuse, contiguous. *Pericarp:* capsules three, inflated, flaccid, united longitudinally by a suture, opening inwards by the acuminate apices. *Seeds:* two, bony, globular, with an oblique point, and an orbicular excavation by the side of the apex. *Observe.* In the second species the germen, instead of being three-cleft, is mostly bifid, and there are generally but two capsules. Essential Character. *Calix:* five-parted. *Petals:* five. *Capsules:* inflated, connate. *Seeds:* two, globular, with a wart.——The species are,

1. Staphylea Occidentalis; *Jamaica Bladder Nut.* Leaves doubly pinnate; capsules three-cornered; seeds solitary; stem arboreous. A tree from twenty to thirty feet high; flowers in terminal, erect, lax clusters, white, odorous.—Native of Jamaica; flowering there in spring and autumn.

2. Staphylea Pinnata; *Five-leaved Bladder Nut.* Leaves pinnate; styles and capsules but two. This has several shrubby stalks rising from the same root, and growing ten or twelve feet high, covered with a smooth bark, and divided into several soft pithy branches; the flowers come out upon long slender pendulous peduncles, from the axils of the stalks near their extremity, in oblong bunches; the petals are white, and expand in the form of a rose.—Native of the south of Europe; and found in the hedges and woods of several parts of England. It is cultivated as a flowering shrub, and makes a variety when mixed with others, though the flowers are not very beautiful. The nuts, being hard and smooth, are strung for beads by the Roman Catholics in some countries; and the children of the poor inhabitants eat the nuts, though they have a disagreeable taste.—Both it and the next species are usually propagated by *suckers* from the root, which this species sends out plentifully. These should be taken from the old plants in autumn, and their roots trimmed, then planted in a nursery, in rows, at three feet distance, and one foot asunder in the rows; in this nursery the plants should stand one or two years, according to their strength, and then be transplanted to the places where they are to remain. The plants thus propagated from suckers, are more subject to put out plenty of suckers from their roots than those which are raised from seeds, or propagated by layers or cuttings, so are not to be chosen when the others can be had; hence those who propagate them for their own use, should prefer the other methods. If they are propagated by *layers*, the young branches should be laid down in autumn, in the same manner as is practised for other trees and shrubs: these will have put out roots in the following autumn, when they may be taken from the old plants, and planted in a nursery, where they may grow one or two years to get strength, and then may be removed to the places where they are to stand. When propagated by *cuttings*, it should be from shoots of the former year; and if they have a small piece of the two-years' wood at the bottom, they will more certainly succeed; for as the young shoots are soft and pithy, so they are very subject to rot when they have no part of the old wood to them. They should be planted in autumn on a shady border, but must not have too much wet. They may also be propagated by sowing their *seeds* early in autumn, in beds of light fresh earth, and when the plants are come up, they must be carefully kept clear from weeds; and in very dry weather, if they are now and then refreshed with water, it will greatly promote their growth. In these beds they may remain until October following; at which time they should be carefully taken up, and planted in a nursery, placing them in rows three feet asunder, and the plants one foot distant in the rows; and if the following spring should prove dry, it will be convenient to give them a little water, to encourage their taking root; after which they will require no farther care but to keep the ground clear from weeds in summer, and every spring to prune off irregular branches, and dig the ground between the rows, to loosen the earth, that the roots may the more easily extend. In this nursery they may remain two years, by which time it will be proper to transplant them out where they are to remain, either in wilderness-quarters, or in clumps of various trees, where they will add to the diversity. The best season for transplanting these trees is in autumn, with other deciduous trees.

3. Staphylea Trifolia; *Three-leaved Bladder Nut.* Leaves ternate; styles and capsules three. This has a more substantial stem than the preceding species; the older branches gray; the younger green, smooth. The flowers are produced from the side of the branches, in longer bunches than those of the former sort, but their peduncles are much shorter; the flowers are of a clearer white, and their petals are somewhat larger; as are also the bladder capsules; the seeds are larger, and ripen better.—Native of North America.

Star Apple. See *Chrysophyllum.*

Star Hyacinth. See *Scilla.*

Star of Bethlehem. See *Ornithogalum.*

Star of the Earth. See *Cucubalus Otites.*

Star Thistle. See *Centaurea.*

Starwort. See *Aster* and *Callitriche.*

Starwort, American. See *Tridax.*

Statice; a genus of the class Pentandria, order Pentagynia. —Generic Character. *Calix:* perianth common of a different structure in the several species; perianth proper one-leafed, funnel-form; tube narrowed; border entire, plaited, scariose. *Corolla:* funnel-form; petals five, united at the base, narrowed below, above wider, obtuse, spreading. *Stamina:* filamenta five, awl-shaped, shorter than the corolla, inserted into the corolla by their claws; antheræ incumbent. *Pistil:* germen very minute; styles five, filiform, distant; stigmas acute. *Pericarp:* capsule oblong, somewhat cylindrical, membranaceous, five-cusped, one-celled, splitting at the base only into five valves, clothed with the permanent

calix, and crowned with its filmy border. *Seed:* single, oblong, hanging from a long cord. Essential Character. *Calix:* one-petalled, entire, plaited, scariose. *Petals:* five. *Capsule:* superior, one-celled, five-valved at the base. *Seed:* solitary.——The species are,

1. Statice Armeria; *Thrift*, or *Sea Gilliflower*. Scape simple, headed; leaves linear, flat, obtuse. Root perennial, woody, bearing thick tufts of lax, linear, channelled, smooth, deep green leaves; stalks about a span high; corolla rose-coloured or pink, varying to deep red, scarlet, and white. The variety with bright red flowers, called *Scarlet Thrift*, makes the best appearance. It was formerly in great esteem for edgings on the sides of borders, in flower-gardens, but requires to be transplanted every year, to keep it within due bounds; and where a plant fails, which often happens, a large and unsightly vacancy remains.—Native of muddy sea-shores, or moist boggy situations, throughout Europe, as well as of America, flowering in July and August. These may be propagated by parting their roots in autumn, that they may take good root before the frost comes on, and flower stronger than if they had been planted in the spring. If they stand long unremoved, they are subject to rot and decay, especially in good ground.

2. Statice Juniperifolia; *Juniper-leaved Thrift*. Scape simple, headed; leaves linear-lanceolate, acute, flat.—Native of Spain and Portugal. This is suspected to be a variety of the preceding, but retains its habit several years in a garden.

3. Statice Alliacea; *Garlick-like Thrift*. Scape simple, headed; leaves linear-lanceolate, acute, flat. This very much resembles the first species.—Native of Spain.

4. Statice Cephalotus; *Large Simple-stalked Thrift*. Scape simple, headed; leaves oblong, flat, acuminate, attenuated at the base; petals rose-coloured, obtuse. This appears to have been common in England.—Native of Portugal.

5. Statice Graminifolia; *Grass-leaved Thrift*. Scape panicled; branches three-sided; leaves linear-channelled. It flowers in June and July.—Native place unknown.

6. Statice Limonium; *Sea Thrift*, or *Sea Lavender*. Scape panicled, round; leaves oblong, obtuse, smooth, nerveless, with a sharp point under the tip, waved at the edge. Root woody, strong, perennial. This plant, which has none of the strong aromatic quality of Lavender, varies much as to luxuriance, being sometimes found with leaves scarcely an inch long, and not more than six or eight flowers in a panicle; and at other times much larger, with the flowers far more abundant. The bright blue colour of the flowers distinguishes it at a distance, and that colour is tolerably permanent. Though less magnificent than some of the foreign species, it is a beautiful plant. Several varieties are found on the Lancashire coast at Low Furness, and on the west side of Milnthorpe sands in Westmoreland. Woodward observes, that two varieties are found on the Suffolk coast. These are much smaller than the common sort, and differ in having no regular footstalk, but only a continuation of the leaf: the one has the leaves short and blunt, the other longer and more pointed. The sharp point at the end of the leaf marks them as belonging to this species.—Common about muddy shores throughout Europe, flowering in July and August. This may be transplanted at almost any time of the year, provided they are carefully taken up, preserving some earth to their roots, and shading them till newly rooted in hot weather. They will afterwards only require weeding, and to have the ground stirred between them in the spring. As they do not require much culture, nor take up much room, a few of each sort may be allowed a place for the sake of variety. They do not propagate very fast in gardens, so that the roots need not be removed oftener than every third or fourth year, at which time they may be slipped to increase them. The best time for this is in autumn, that the plants may be well rooted before the spring; otherwise they will not flower very strong in the following summer. They should be planted in a loamy soil on an eastern-aspected border, where they may enjoy the morning sun, and be screened from the great heat in the middle of the day; in such a situation they will continue for several years, and flower as well as in their native soil. They may also be propagated by seeds, which must be procured from abroad for the foreign species. The seeds should be sown upon a border exposed to the morning sun, and on a soft loamy soil, early in the spring, for the seeds lie a considerable time in the ground before the plants come up; therefore the ground must be kept entirely clean from weeds; and the border watered two or three times a week in dry seasons, without which the plants would lie a whole year before they vegetate. When they appear, weed, and in very dry weather water them, and let them be transplanted in the autumn where they are designed to remain. Martyn observes, that the common practice is to consider this as a green-house plant, because it appears to greatest advantage in a pot; and being much disposed to throw up new flowering-stems, by having several pots of it, some will be in flower throughout the summer. On this account, and for the singularity of its large blue calix, it deserves attention. Though in a manner a biennial, he adds, it may often be increased by parting its roots; and sometimes, though sparingly, produces seed in England.

7. Statice Gmelinii. Scape panicled, angular; leaves oblong-ovate, emarginate, flat, cartilage-edged, mucronate beneath.—Native of Siberia, in salt marshes.

8. Statice Scoparia. Scape panicled, round; leaves oblong, ovate, coriaceous, mucronate, dotted beneath. This resembles the next species.—Native of Siberia.

9. Statice Latifolia; *Broad-leaved Sea Lavender*. Scape panicled, very much branched, rugged; leaves pubescent, with hairs in stellated bundles; flowers mostly two together; corolla longer than the calix, blue. This is distinguished by the great length of its oblong leaves, and the vast profusion of its small blue flowers.—Found in Russian Tartary.

10. Statice Oleifolia; *Olive-leaved Sea Lavender*. Scape panicled; branches angular, winged; leaves lanceolate, mucronate-cusped, cartilaginous at the edge. Root perennial, woody; flowers on the extreme branches in close spikes; corolla red, consisting of five petals, but cohering so as to appear one-petalled. It flowers late in August, and never perfects seed in England.—Native of France, Italy, and Spain, on the sea-coasts.

11. Statice Incana; *Hoary Sea Lavender*. Scape panicled; leaves lanceolate, three-nerved, somewhat waved, mucronate at tip; branches of the panicle three-sided. Root perennial; flowers white.—Native of Egypt and Siberia.

12. Statice Auriculæfolia; *Auricula-leaved Sea Lavender*. Scape simple, round; spikes lateral and terminating, directed one way; leaves spatulate, acute; flowers very much clustered.—Native of the coast of Barbary and Spain.

13. Statice Cordata; *Heart-leaved Sea Lavender*. Scape panicled; leaves spatulate, retuse; flowers numerous, blue, imbricate, one-ranked.—It grows naturally near the sea, about Marseilles and Leghorn, and on maritime rocks of Piedmont, Spain, and Africa.

14. Statice Scabra; *Rough-branched Sea Lavender*. Leaves radical, obovate, oblong, obtuse; branches rugged.—Native of the Cape.

15. Statice Tetragona; *Square-stalked Sea Lavender.* Scape panicled, four-cornered; leaves ovate.—Native of the Cape.

16. Statice Reticulata; *Matted Sea Lavender.* Scape panicled, prostrate, flexuose; lower branches barren; leaves wedge-shaped, awnless. Root strong, woody, and perennial; flowers few together, in simple terminating spikes or bundles, erect, each enveloped in three or four larger blunt bractes. The ribs of the calix and the petals are of a bright purplish blue, which turns white in drying.—Native of the south of France, and of Malta. Found also on the east coast of England, particularly in Norfolk, especially about Wells, Cley, and Holkham, where it covers many acres of muddy salt marshes in July and August with its blue flowers. There are several varieties.

17. Statice Echioides; *Rough-leaved Sea Lavender.* Scape panicled, round, jointed; leaves rugged. This is an annual or biennial plant; stalks about eight inches high, dividing into two or three small branches, which are terminated by short reflexed spikes of pale blue flowers coming out late in August, and seldom perfecting seeds in England.—Native of the south of Europe, and of rocks near Mascar in Barbary. The seeds of this, with the next, and the thirty-fourth species, must be obtained from abroad, and sown in autumn, that the plants may come up in the following spring. They should have a border of loamy earth, not stiff nor moist, and exposed to the south; but when the sun is warm, the border should be shaded with mats, to prevent the earth from drying too fast. When the plants come up, they must be kept clean from weeds; and should they grow too close, some of them must be taken out as soon as they are fit to remove, and planted in small pots, shading them until they have taken new root. Then place them where they can enjoy the morning sun in autumn; when they should be put into a hot-bed frame, where they may be screened from hard frost, but enjoy the free air in mild weather; and those plants which are left in the border, must be covered with mats in hard frost, for though they will often live through the winter in mild seasons, yet hard frost always destroys them: in the next summer they will flower, and ripen seed if the season prove warm and dry, soon after which the roots decay.

18. Statice Speciosa; *Plantain-leaved Sea Lavender.* Scape branched, round; branches ancipital, winged; flowers imbricate; leaves obovate, cusped, mucronate, cartilaginous at the edge. The whole plant has a bitterish salt taste. The root is biennial, and the calices undivided. It flowers in July and August.—Native of Russia. See the 17th species.

19. Statice Tatarica; *Tartarian Sea Lavender.* Scape branched, divaricating; branches three-sided; flowers distant; leaves lanceolate-obovate, mucronate; stalks five or six inches high; branchlets terminated by spikes of pale blue flowers ranged on one side the footstalk: the whole, when growing, being spread wide, has somewhat the appearance of an umbel of flowers.—Native of Russia.

20. Statice Echinus; *Prickly Mountain Thrift.* Scape panicled; leaves subulate, mucronate. The long and nodding black root is crowned with dense tufted leafy stems and branches, two or three inches high; flowers of a bright pink, very beautiful, three or four together, in terminal solitary spikes.—Native of Greece.

21. Statice Flexuosa. Scape dichotomous; corymb fastigiate; spikes headed; leaves lanceolate, wedge-shaped, obtuse, mucronate, three-nerved.—Native of Siberia.

22. Statice Purpurata. Stem shrubby, leafy; leaves obovate-cuneate, three-nerved, mucronate; corollas purplish.—Native of the Cape.

23. Statice Longifolia. Stem panicled, rugged, erect; leaves obovate-linear.—Native of the Cape.

24. Statice Minuta. Stem suffruticose, leafy; leaves clustered, wedge-shaped, smooth, awnless; scapes few-flowered.—Native of the shores of the Mediterranean.

25. Statice Pectinata; *Triangular-stalked Sea Lavender.* Stem and branches panicled, three-sided; leaves obovate, petioled; spikes directed one way. It flowers in September and October.—Native of the Cape. This, and the two following shrubby plants, are too tender to live through the winter in the open air of England; so that the plants must be removed into shelter in the autumn, but they only require protection from hard frost, and may be placed along with Myrtles, Oleanders, and other hardy green-house plants, where they often continue to flower during great part of the winter, and make a pretty variety. They are easily propagated by cuttings, which, if planted in July on a shady border, and duly watered, will take root in six or seven weeks, when they should be taken up, and planted into pots filled with light loamy earth, placing them in the shade till they have taken root; they may be exposed till October, and then removed into shelter.

26. Statice Suffruticosa; *Narrow-leaved Shrubby Sea Lavender.* Stem shrubby, naked, and branched at top; heads sessile; leaves lanceolate, sheathing.—It flowers most part of the summer in Siberia, where it is a native.

27. Statice Monopetala; *Broad-leaved Shrubby Sea Lavender.* Stem shrubby, leafy; flowers solitary; leaves lanceolate, sheathing: it flowers from June till August, but never produces seeds in England.—Native of Sicily; where there is a variety which bears galls like those upon the Oak; found also in Barbary, near Kerwan.

28. Statice Axillaris; *Axil-flowering Sea Lavender.* Stem shrubby, leafy; panicles spiked, axillary; leaves lanceolate, sheathing; flowers minute.—Native of Arabia.

29. Statice Cylindrifolia; *Cylinder-leaved Sea Lavender.* Stem shrubby, leafy, dichotomous; leaves round, sheathing. Native of Arabia and Northern Africa.

30. Statice Linifolia; *Flax-leaved Sea Lavender.* Stem shrubby, prostrate; flowers panicled, directed one way; leaves linear.—Native of the Cape.

31. Statice Aurea; *Golden-cupped Sea Lavender.* Stem shrubby, leafed, branched; leaves awl-shaped.—Native of Dauria, in mountainous pastures.

32. Statice Ferulacea; *Cut-leaved Sea Lavender.* Stem shrubby, branched; branchlets imbricate, with chaffs terminated by hair; flowers subimbricate, ascending, directed one way, yellow.—Native of Spain, Portugal, and Barbary.

33. Statice Pruinosa; *Frosty Sea Lavender.* Stem flexuose, branched, scurfy; branches alternate, shorter than the stem.—Native of Palestine.

34. Statice Sinuata; *Scallop-leaved Thrift.* Stem herbaceous, ancipital; root-leaves lyrate; stem-leaves linear. Stems decumbent, a span long, branched, with leafy wings, and whorls of narrow acute leaves, about an inch long. These are terminated by panicles of flowers, which sit upon winged peduncles, each sustaining three or four flowers of a light blue colour, which continue long without fading. It flowers in July and August; but unless the summer is warm and dry, the seeds do not ripen in England. This is one of those few plants which have calices of a more beautiful colour than their corollas; and which colour does not fade in drying: the dried flowers are therefore an ornament in winter.—Native of Sicily and the Levant, Spain, and the sandy sea-shores of Barbary. There are several varieties. See the 17th species.

35. Statice Lobata. Leaves sinuate; stems round, leafless.

The bractes are like those of the preceding species; calices white; corolla blue.—Native of Africa.

36. Statice Spicata. Stem round, leafless; spikes alternate, cylindrical; leaves sinuate. Root tuberous; calix and petals whitish.—Native of Persia.

37. Statice Mucronata; *Curled Sea Lavender.* Stem curled; leaves elliptic, entire; spikes directed the same way. Root perennial, branched, fibrous, fragrant; flowers sessile, two from each glume, directed one way, ascending, very close, purple.—Native of Morocco.

38. Statice Globularifolia. Leaves acuminate, horizontal; panicle loose; racemes terminating, directed one way; border of the calix and petals white. The leaves vary in shape. —Native of Barbary, found by the hot springs near Bona.

39. Statice Spathulata. Leaves radical, spatulate, obtuse, glaucous, quite entire, on long petioles; scape round; branches panicled; flowers racemed, directed one way.—Native of Barbary, on rocks near La Calle.

40. Statice Caroliniana. Scape round; panicles divaricate, very branchy; calices acute; leaves lanceolate-oblong, slightly obtuse, glabrous; flowers blue.—Grows in salt marshes along the sea-coast, from New Jersey to Carolina.

Stellaria; a genus of the class Decandria, order Trigynia. —Generic Character. *Calix:* perianth five-leaved; leaflets ovate, lanceolate, concave, acute, spreading, permanent. *Corolla:* petals five, two-parted, flat, oblong, shrivelling. *Stamina:* filamenta ten, filiform, shorter than the corolla, alternately longer and shorter; antheræ roundish. *Pistil:* germen roundish; styles three, capillary, spreading; stigmas obtuse. *Pericarp:* capsule ovate, covered, one-celled, six-valved. *Seeds:* very many, roundish, compressed. *Observe.* The third species has the petals five-parted. Essential Character. *Calix:* five-leaved, spreading. *Petals:* five, two-parted. *Capsule:* superior, one-celled, many-seeded, six-toothed at top. *Seeds:* numerous.—For the propagation and culture of the plants of this genus, see *Arenaria.*—— The species are,

1. Stellaria Nemorum; *Wood Stitchwort.* Lower leaves cordate, petioled; upper ovate, sessile; panicle dichotomous. Root perennial, small, creeping; stems several, weak and lax, three feet high. The numerous star-like flowers are visible at a distance, and are of delicate structure when closely examined: they are white and upright, in a terminating, dichotomous, many-flowered, divaricating, pubescent panicle, having a pair of small leaves at each of the forkings.—Native of Europe. It is generally confined to moist woods and the borders of clear shaded springs, especially in the northern counties of England, and the low lands of Scotland, where it flowers in May. Found near Casterton Mill, Kirby Lonsdale; near Kendal; near Darlington; about Broomholm and Langholm in Eskdale; and at Springfield and Hoddam Castle; and abundantly in Annandale, and at Meavis Bank.

2. Stellaria Dichotoma; *Forked Stitchwort.* Leaves ovate, sessile; stem dichotomous; flowers solitary, fruiting; peduncles reflexed. Root annual; corolla white. It flowers in July.—Native of Siberia.

3. Stellaria Radians; *Ray-flowered Stitchwort.* Leaves lanceolate, serrulate; petals five-parted. Flowers terminal, solitary, white, on slender stalks.—Native of Siberia, in bogs.

4. Stellaria Bulbosa; *Bulbous Stitchwort.* Leaves ovate, veinless beneath; stem somewhat branched; peduncle one-flowered; root filiform, creeping, bulbiferous.—Native of the mountains of Carinthia, in moist and shady places.

5. Stellaria Holostea; *Greater Stitchwort.* Leaves lanceolate, serrulate; petals bifid; calix nerveless. Root perennial, creeping, weak, slender, jointed, sending down fibres to a considerable distance; stems several, growing thick together about a foot high, decumbent at the base, slender, and very delicate; flowers on very long rugged erect peduncles, from the axils of the upper pair of leaves, forming a sort of dichotomous panicle; corolla white.—Native of Europe. It is very common in woods, among bushes, and about dry hedge bottoms in England, flowering in May and June. Its large brilliant white starry blossoms render it very conspicuous in spring.

6. Stellaria Graminea; *Lesser Stitchwort.* Leaves linear-lanceolate, quite entire; panicle terminating, divaricating; calix three-nerved, equal, or nearly so, to the petals. Root perennial, creeping; stem and flower-stalks perfectly smooth. The white starry blossoms of this delicate plant prettily bespangle Furze-bushes, Heath, and low Broom, on a gravelly or sandy soil; and its herbage being concealed by the bushes or grass, and the stalks of the panicle very slender, the flowers seem suspended in air. They are principally observable in June and July.—Native of Europe.

7. Stellaria Glauca; *Glaucous Marsh Stitchwort.* Leaves linear-lanceolate, quite entire, glaucous; peduncles erect; calix three-nerved, shorter than the petals; flowers almost twice as large as the preceding. It flowers in June and July. —Native of Germany and England. Found in the Isle of Ely; near Oxford; and in Peckham fields, &c.

8. Stellaria Crassifolia; *Thick-leaved Stitchwort.* Leaves oblong-lanceolate, thickish, glaucous; peduncles one-flowered, solitary, axillary; petals bigger than the calix; stem upright. Annual.—Native of Germany, in moist meadows.

9. Stellaria Uliginosa; *Bog Stitchwort.* Leaves elliptic-lanceolate, quite entire, callous at the tip; flowers subpanicled, lateral; petals shorter than the calix. Root annual, small, and fibrous; herb weak and slender, smooth, of a pale and somewhat glaucous green. Mr. Curtis remarks, that the leaves are united at the bottom, above half an inch in length, and two or three lines in breadth, frequently growing to one side of the stalk, and bending towards each other so as almost to touch at the points; and that the tips are conspicuously brown and callous; also that the flowers would be terminating, did not a new shoot, rather than a continuation of the stem, proceed from the panicle. It flowers in June and July, and is not uncommon in England.—Native of Europe on the sides of springs, rivulets, ditches, and wet meadows.

10. Stellaria Undulata; *Wave-leaved Stitchwort.* Leaves oblong, waved; stem angular; flowers axillary. Branches angular, erect.—Native of Japan, by the way-sides.

11. Stellaria Cerastoides; *Alpine Stitchwort.* Leaves elliptic-oblong, obtuse; stem subbiflorous; calices one-nerved, pubescent. Root perennial, creeping; flowers erect, white, appearing in June.—Native of the mountains of Lapland, Norway, Switzerland, France, Piedmont, and Scotland, where it was found near Invercauld.

12. Stellaria Multicaulis; *Many-stalked Stitchwort.* Leaves lanceolate, smooth; branches upright, quite simple; peduncles subsolitary, terminating; petals bigger than the calix. Root creeping, filiform; branches or stems quite simple, erect, numerous, from the root. Very different from the preceding species.—Native of Carinthia.

13. Stellaria Humifusa; *Procumbent Stitchwort.* Leaves ovate, mostly on one side, sessile; stems procumbent, four-cornered; peduncles solitary, abbreviated. This is an annual plant; flowers terminal, white, rather showy; petals a little larger than the calix.—Native of Sweden and Norway.

14. Stellaria Biflora; *Two-flowered Stitchwort.* Leaves awl-shaped; branches two-parted; petals emarginate; calices striated. Stem a finger's length, filiform, for the most part naked. Perennial.—Native of the mountains of Lapland.

15. Stellaria Groenlandica; *Greenland Stitchwort.* Stems decumbent, subbiflorous; leaves linear, subciliate at the base; petals emarginate; fruits globular; flowers white, large in proportion to the plant.—Native of Greenland.

16. Stellaria Arenaria; *Sandwort Stitchwort.* Leaves spatulate; stem erect, bifid; branches alternate; petals emarginate. Root annual, fibrous; corolla bell-shaped, longer than the calix, white.—Native of Spain.

17. Stellaria Scapigera; *Scape-bearing Stitchwort.* Stem very short; leaves linear-lanceolate, three-nerved; peduncles radical, one-flowered.—Native country unknown.

18. Stellaria Pubera. Plant pubescent; leaves sessile, ovate, ciliate; pedicels erect; petals longer than the calix; flowers large, white.—Grows in shady woods, on rich soil, from Pennsylvania to Carolina.

19. Stellaria Media. Leaves ovate, glabrous; stalks procumbent, with a line, lateral, hairy, alternate; stamina three, five, or ten.—A common North American species, growing in cultivated grounds, and flowering from April to September.

Stellera; a genus of the class Octandria, order Monogynia. —Generic Character. *Calix:* none. *Corolla:* one-petalled, funnel-form, permanent; tube filiform, long; border four or five-cleft, with the lobes ovate. *Stamina:* filamenta eight or ten, very short; antheræ oblong, alternately in the middle of the tube, and within the throat. *Pistil:* germen subovate; style very short, permanent; stigma headed. *Pericarp:* none. *Seed:* one, shining, beaked nut. *Observe.* The first species has eight, and the second ten stamina. Essential Character. *Calix:* none. *Corolla:* mostly four-cleft. *Stamina:* very short. *Nut:* solitary, beaked.——The species are,

1. Stellera Passerina; *Flax-leaved Stellera.* Leaves linear; flowers axillary, sessile, four-cleft. Root slender, fusiform, scarcely branched, yellow on the outside, white within; stem upright, from a hand and half to a foot in height, very much branched from the very bottom; leaves alternate, shaped like a sparrow's tongue. This plant is acrid, bitter, and purgative. Gmelin says, that the Russians require half a drachm or two scruples for a purge, whereas twelve grains are sufficient for other people.—Native of dry sunny fields in Germany, Switzerland, France, and Italy, flowering in July and August.

2. Stellera Chamæjasme; *Siberian Stellera.* Leaves lanceolate; flowers terminating; racemes naked, five-cleft. Perennial.—Native of Siberia, on the banks of rivers.

Stemodia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, five-parted, erect, equal, permanent. *Corolla:* one-petalled, irregular; tube length of the calix; border subbilabiate, almost upright; upper lip ovate, entire; lower three-parted, with the parts rounded, equal. *Stamina:* filamenta four, almost equal, length of the tube, all bifid; antheræ eight, each placed on each division of the filamenta. *Pistil:* germen bluntish; style simple, length of the stamina; stigma bluntish. *Pericarp:* capsule oblong, ovate, two-celled, two-valved; partition contrary. *Seeds:* numerous, globular. *Receptacle:* subcylindrical. Essential Character. *Calix:* five-parted. *Corolla:* two-lipped. *Filamenta:* four, cloven, two-anthered. *Capsule:* two-celled.——The species are,

1. Stemodia Maritima. Leaves opposite, half embracing; flowers sessile, solitary. Root long, round, with lateral horizontal fibres; stem from one to three feet high, erect, four-cornered, hirsute, sometimes in hedges near the sea-coast in a manner scandent; corolla blue and soon falling. This plant has a pleasant aromatic smell, with a bitterish taste.—Native of Jamaica, very common in the southern coasts.

2. Stemodia Durantifolia. Leaves ternate and connate; flowers subtern, subsessile. Stem herbaceous, a foot high, erect, branched, leafy, quadrangular at the bottom, but the angles are rounded towards the top, hirsute, viscid; corollas blue, small; calix almost five-leaved.—Native of Jamaica.

3. Stemodia Viscosa. Leaves opposite, embracing; flowers peduncled, solitary. This is a small, annual, herbaceous plant, with a pleasant aromatic smell; stem generally bent to one side, with many spreading branches from its base.—Native of Coromandel, in rice-fields.

4. Stemodia Ruderalis. Leaves ovate, serrate, petioled; flowers axillary, opposite.—Native of the East Indies.

5. Stemodia Camphorata. Leaves ovate, stalked; flowers in clusters. Stem herbaceous, a foot high; flowers yellowish-green.—Native of Ceylon.

Sterbeckia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth three or five leaved; leaflets roundish, concave, acute. *Corolla;* petals three or five, roundish, crenate, clawed, longer than the calix. *Stamina:* filamenta very many, capillary, inserted into the receptacle; antheræ roundish. *Pistil:* germen ovate, superior; style long, curved in at the tip; stigma headed, concave. *Pericarp:* capsule cylindrical, long, corticose, one-celled, not opening. *Seeds:* many, large, angular, incumbent on each other, nestling in the pulp. Essential Character. *Calix:* three or five leaved. *Corolla:* three or five petalled. *Capsule:* corticose, not opening, legume-shaped, many-seeded. *Seeds:* imbricate, nestling in pulp. ——The only species is,

1. Sterbeckia Lateriflora. Leaves subopposite, petioled, elliptic, acuminate, quite entire, veined, smooth; peduncles many-flowered, very short, lateral; flowers white, small. It is a scandent shrub.—Native of Guiana, in woods.

Sterculia; a genus of the class Dodecandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, very large, coriaceous, flat, coloured, deciduous, five-parted; parts lanceolate-acute. *Corolla:* none, but a nectary placed on a cylindric column, bell-shaped, small, five-toothed; teeth subtrifid. *Stamina:* filamenta ten or about fifteen, very short, two or three on each tooth of the nectary; antheræ ovate. *Pistil:* germen globular, five-grooved, in the bottom of the nectary; style filiform, curved in; stigma club-shaped, bifid, or five-lobed. *Pericarp:* capsules five, ovate, reniform, from spreading reflexed, one-celled, opening by the interior angle. *Seeds:* many, oval, fastened to the suture. Essential Character. *Calix:* five-parted. *Corolla:* none. *Nectary:* bell-shaped, five-toothed, staminiferous, fastened to the column of the germen. *Germen:* pedicelled. *Capsules:* five, one-celled, opening by the inner side, many-seeded.—The plants of this genus are propagated by seed, and treated in the same way as *Sido*, which see.——The species are,

1. Sterculia Lanceolata; *Lance-leaved Sterculia.* Leaves lanceolate; capsules oblong. This is a moderate-sized tree. —Native of China.

2. Sterculia Balanghas. Leaves ovate-lanceolate; capsules obovate. This is a tall tree, with a stem two feet in diameter; branches thick, covered with an ash-coloured bark. —Native of Malabar and Amboyna, where the inhabitants consider the seeds as esculent, and roast them, while the capsules are burnt to prepare the pigment called *Cassomba.*

3. Sterculia Crinita. Leaves ovate or three-lobed; capsules crinite at the base. This is a tree sixty feet high, branching in a spreading manner at the top.—Native of Guiana, in the woods of Sinemari, and near the river Galibien, flowering in October.

4. Sterculia Cordifolia; *Heart-leaved Sterculia.* Leaves cordate, obsoletely three-lobed; capsules acuminate, tomentose; stem arborescent.—Native of Senegal.

5. Sterculia Colorata; *Coral-flowered Sterculia.* Leaves five-lobed; lobes acuminate; calices cylindric club-shaped; capsules oblong, smooth, coloured. Trunk erect, growing to a very great size, with smooth greyish branches, leafy at the end. This tree casts its leaves during the cold season. It flowers in April, and then appears as if entirely covered with fine ramifications of red coral: soon afterwards the leaves make their appearance.—Native of the mountainous parts of the Rajamundry Circar; called *Karaka* by the Telingas.

6. Sterculia Urens; *Stinging Sterculia.* Leaves five-lobed; lobes acuminate; calices bell-shaped; capsules ovate, hispid. Trunk erect, very straight, with the top large and shady.—This very large tree is chiefly a native of the mountainous countries of the coast of Coromandel: it casts the leaves about the end of the wet season, and flowers during the cold season; the leaves come out with the fruit about the beginning of the hot season. The wood is soft and spungy; towards the centre of the large trees it is reddish. It seems to be applied to little use except to make Hindoo guitars. The water in which green branches were kept for examination, became thick like a clear glutinous jelly. The bark is exceedingly astringent, and tinges the saliva reddish. The seeds are roasted to be eaten by the natives, and taste very like parched peas.

7. Sterculia Platanifolia; *Plane-leaved Sterculia.* Leaves palmate, five-lobed; calices wheel-shaped, reflexed. In England this is a hardy green-house plant, flowering in July; but in its native soil is said to be a very lofty tree.—Native of Japan and China.

8. Sterculia Fœtida; *Fetid Sterculia.* Leaves digitate. This is a middle-sized tree, with spreading unarmed branches; flowers monœcous, fetid, in subterminating racemes.—Native of the East Indies and Cochin-china. The wood is pale, lasting, and does not split; it is therefore very proper for the turner, and being well varnished, makes handsome vases. It has nothing of the ill smell which the flowers have. The leaves, and especially the bark, are aperient, repellent, diuretic, and diaphoretic. The seeds are oily, and are not eaten in Cochin-china, because they cause nausea and vertigo. Ten other species of *Sterculia* have been described by botanists; all natives of hot climates.

Stilago; a genus of the class Gynandria, order Triandria, or Dicœcia, Diandria, or Triandria.—Generic Character. *Calix:* perianth one-leafed, hemispherical, almost entire, three-lobed. *Corolla:* none. *Stamina:* filamenta three, placed on the germen, spreading, longer than the calix. *Pistil:* germen superior, roundish; style cylindrical, permanent, shorter than the stamina; stigma warted. *Pericarp:* drupe globular. *Seed:* nut globular. *Observe.* The male and female are on separate trees. Essential Character. *Calix:* one-leafed, pitcher-shaped. *Corolla:* none. *Female. Stigmas:* sessile. *Drupe:* with a two-celled nut.——The species are,

1. Stilago Bunias. Leaves alternate, petioled, simple, ovate-oblong, quite entire, smooth; flowers small, scattered, sessile; spikes alternate, naked, very long.—It flowers in August; and is a native of the East Indies.

2. Stilago Diandra. Leaves alternate, on short petioles, nearly bifarious, or two-faced, oval, entire, smooth, from two to four inches long, and from one to two broad; stipules lanceolate; flowers very small, approximated. The fruit when ripe is eaten by the Hindoos, who also employ the wood for various purposes.—It is a large tree, native of the mountainous parts of the circars, where it flowers in June.

Stilbe; a genus of the class Polygamia, order Dicœcia.—Generic Character. *Hermaphrodite. Calix:* exterior perianth three-leaved, setting aside the four exterior ones; leaflets lanceolate, spreading, and mucronate. Interior perianth, one-leafed, five-toothed, cartilaginous, to be hardened. *Corolla:* one-petalled, funnel-form; tube length of the calix; border five-parted; parts linear. *Stamina:* filamenta four, awl-shaped, placed on the throat, longer; antheræ cordate, obtuse. *Pistil:* germen superior, ovate; style filiform, length of the stamina; stigma acute. *Pericarp:* none, but the interior calix inclosing the seed, hardening, deciduous. *Seed:* one. *Male,* on a distinct individual. *Calix:* exterior as in the hermaphrodite; interior none. *Corolla:* as in the hermaphrodite, but the tube membranaceous. *Stamina:* as in the hermaphrodite. *Pericarp* and *Seed:* none. *Hermaphrodite. Calix:* exterior, three-leaved; interior, five-toothed, cartilaginous. *Corolla:* funnel-form, five-cleft. *Stamina:* four. *Seed:* one, calyptred with the interior calix. *Male,* similar. *Calix:* interior none. *Fruit:* none. Essential Character. *Calix:* inferior double, the outer of three leaves; inner five-toothed, cartilaginous. *Corolla:* funnel-shaped. *Capsule:* of one cell and one valve, separating entire from the base. *Seed:* solitary.——The species are,

1. Stilbe Pinastra. Spikes hirsute; leaves in sixes, linear; branches alternate, stiff, rugged with the remaining bases of the leaves.—Native of the Cape.

2. Stilbe Ericoides. Spikes smooth; leaves in fours, lanceolate; corollas even.—Native of the Cape.

3. Stilbe Cernua. Spikes drooping; leaves in fours. This is very like the first species.—Native of the Cape.

Stillingia; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male Flowers,* digested in an amentaceous spike. *Calix:* perianth many-flowered, coriaceous, hemispherical, pitcher-shaped, quite entire, with two goblet-shaped glands. *Corolla:* one-petalled, tubular, funnel-form, widening gradually, much narrower than the calix; mouth undivided, torn, ciliate. *Stamina:* filamenta two, filiform, twice as long as the corolla, divaricating at the top, very slightly united at the base; antheræ twin, reniform. *Female Flowers,* few, at the base of the same spike. *Calix:* perianth one-flowered; the rest as in the males. *Corolla:* superior. *Pistil:* germen roundish, between the calix and corolla; style filiform; stigmas three, distinct, recurved. *Pericarp:* capsule tricoccous, subturbinate, subtrigonal, three-celled, surrounded at the base by the widened calix. *Seeds:* solitary, oblong, subtrigonal, with a transverse scar on the inner side. Essential Character. *Male. Calix:* hemispherical, many-flowered. *Corolla:* tubular, erose. *Female. Calix:* one-flowered, inferior. *Corolla:* tubular, superior. *Style:* trifid. *Capsule:* tricoccous.——The species are,

1. Stillingia Sylvatica. Leaves alternate, petioled, remote, elliptic, serrulate, shining, spreading; spike or ament terminating, sessile; flowers small, yellow. It is accounted a specific in siphilis.—Native of Carolina, in Pine woods.

2. Stillingia Ligustrina. Stem shrubby; leaves lanceolate, tapering at each end, entire.—Native of shady woods in North Carolina and Georgia.

Stipa; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume one-flowered, two-valved, lax, acuminate. *Corolla:* two-valved; outer valve terminated at the tip by a very long twisted awn, jointed at the base, and straight; inner valve length of the outer, awnless, linear. Nectary two-leaved; leaflets linear-lanceolate, membranaceous, gibbous at their base. *Stamina:* filamenta three, capillary; antheræ linear. *Pistil:* germen oblong;

styles two, hirsute, united at the base; stigmas pubescent. *Pericarp:* none; glume adnate. *Seed:* one, oblong, covered. Essential Character. *Calix:* two-valved, one-flowered. *Corolla:* outer valve with a terminating awn, jointed at the base.——The species are,

1. Stipa Pennata; *Soft Feather Grass.* Awns feathery. Root perennial, fibrous, tufted; culms simple, a foot high. The feathered awns form a beautiful and remarkable feature, at once distinguishing this from all other Grasses. Johnson, the editor of *Gerarde's Herbal,* says it was nourished for its beauty in sundry of our English gardens; and that it was worn by sundry ladies and gentlewomen instead of a feather, which it exquisitely resembles.—It was first noticed by Clusius near Baden, and in several parts of Austria and Hungary; and has since been observed in several parts of Germany, France, Italy, Spain, Barbary, and Silesia. In England it has been found upon the limestone rocks hanging over a little valley called Long Sleadale, about six miles north of Kendal in Westmoreland; but it has not been seen of late years.

2. Stipa Juncea; *Rush-leaved Feather Grass.* Awns naked, straight; calices longer than the seed; leaves smooth within. Root perennial, or biennial; culm erect, slender, jointed at bottom.—Native of France, Switzerland, Silesia, Carniola, and Barbary, flowering in July.

3. Stipa Capillata; *Capillary Feather Grass.* Awns naked, curved; calices longer than the seed; leaves pubescent within. Culms numerous, two feet high, hard, and solid; leaves rushy at the base; flowers in a compressed panicle, brown.—Native of France, Germany, Switzerland, and Italy.

4. Stipa Aristella; *Short-awned Feather Grass.* Awns naked, straight, scarcely twice as long as the calix; germina woolly. Root perennial; culms two feet high; calix length of the seed; leaves narrow.—Native country about Montpellier.

5. Stipa Paleacea; *Chaffy Feather Grass.* Awns half naked; panicle simple; leaves convoluted, awl-shaped, pubescent within; root-leaves abundant, awl-shaped, rigid, two inches long.—Found in Africa and Egypt.

6. Stipa Tenacissima; *Tough Feather Grass.* Awns hairy at the base; panicle spiked; leaves filiform; flowers panicled, approximating, numerous.—Native of the sand-hills of Spain and Barbary, where the inhabitants convert it into ropes, mats, and baskets.

7. Stipa Capensis; *Cape Feather Grass.* Awns hairy at the base; panicle spiked; leaves ensiform.—Native of the Cape.

8. Stipa Spicata; *Spiked Feather Grass.* Awns hairy at the base; raceme spiked, directed to one side. Root perennial, creeping, producing many culms; flowers sessile, scarcely pubescent, villose at the base.—Native of the Cape.

9. Stipa Bicolor; *Two-coloured Feather Grass.* Awns naked; seeds obovate, bearded at the base. Culm a foot and half high, erect, striated, sheathed, smooth; ligule or stipule membranaceous.—Native of Brazil, and Monte Video.

10. Stipa Avenacea: *Oat Feather Grass.* Awns naked; calices equalling the seed; culms slender; upper leaf ventricose.—Native of Virginia.

11. Stipa Membranacea; *Membranaceous Feather Grass.* Pedicels dilated, membranaceous. This grass is scarcely a foot high, with the appearance of an Avena; culm even, the thickness of a small thread. The upper flower but one sessile.—Native of Spain.

12. Stipa Barbata; *Bearded Feather Grass.* Leaves rigid, striated on one side; panicle lax, elongated; awns very long, bearded from the base to the tip. This resembles the first species, but differs in having rigid, glaucous, flattish leaves, striated on one side, wider, serrate, with a very long awn, hirsute on every side from the base to the tip.—Native of Barbary, about Mascar and Tlemsen.

13. Stipa Parviflora; *Small-flowered Feather Grass.* Leaves radical, stiffish, filiform; panicle diffused; awns naked, capillaceous. Roots perennial, fibrous, flexuose, long.—Native of dry hills near Mascar, and in the kingdom of Tunis.

14. Stipa Tortilis; *Twisted-awned Feather Grass.* Panicle spiked, rolled in at the base; inner calix villose; awns twisted, villose at bottom. Culm erect, many from the same root. The flowers are deciduous, and very numerous: they adhere to the clothes of passengers, and incommode them by tickling and pricking them. It is an annual grass.—Native of Barbary, where it is found in the fields.

15. Stipa Canadensis. Leaves setaceous; panicle small; calices glabrous, obtusely ovate; awns thick, short.—Grows in the rocky parts of Canada, Hudson's Bay, &c.

16. Stipa Expansa. Leaves striate, glabrous; spikes alternate, paniculate, expanded; flowers sessile, remote; calices longer than the corolla; awn very short, naked.—Grows in Carolina.

17. Stipa Stricta. Leaves arundinaceous; panicles elongate, awned; peduncles jointed, very upright; awns naked, subflexuose.—Grows in Carolina.

Eight other species of *Stipa* have been found in New Holland, and two in South America.

Stitchwort. See *Stellaria.*

Stock Gillyflower. See *Cheiranthus.*

Stoebe; a genus of the class Syngenesia, order Polygamia Segregata.—Generic Character. *Calix:* common roundish, imbricate; scales awl-shaped, covering the universal receptacle on every side; perianth partial, one-flowered, five-leaved, solitary within each scale of the common calix, consisting of linear, acute, equal, erect leaflets. *Corolla:* proper one-petalled, funnel-form; border five-cleft, patulous. *Stamina:* filamenta five, capillary, short; antheræ cylindrical, five-toothed. *Pistil:* germen oblong; style filiform, length of the stamina; stigma acute, bifid. *Pericarp:* none; calix unchanged. *Seeds:* solitary, oblong; down feathered, long. *Receptacle:* proper, naked. Essential Character. *Calix:* one-flowered. *Corolla:* tubular, hermaphrodite. *Receptacle:* naked. *Down:* feathered.——The species are,

1. Stoebe Æthiopica. Leaves recurve-hooked, naked; stem two or three feet high, sending out slender branches from the sides. The flowers are produced in single heads at the ends of the branches, and are of a pale yellow colour.—Native of the Cape. See the fourth species.

2. Stoebe Ericoides. Leaves recurved, hoary; corollas two-flowered, differm, and hemispherical. This is a distorted little shrub, like Heath.—Native of the Cape.

3. Stoebe Prostrata. Leaves resupine, tomentose on one side; stem prostrate; heads simple, terminating, sessile, the size of Peas.—Native of the Cape.

4. Stoebe Gnaphaloides. Leaves imbricate, pressed close; stems shrubby, proliferous, rod-like, a foot and half high; with filiform branches, covered with pressed-close leaves; flowers sessile, in bundles.—Native of the Cape. This, and all the plants of this genus, may be propagated by cuttings or slips, planted in July upon a bed of soft loam, and covered close down with a bell or hand glass, shading them from the sun until they have taken root, then gradually inure them to the open air, and afterwards take them up, and plant them in pots, placing them in the shade till they have taken new root; then place them in a sheltered situation, with other exotic tender plants, and in autumn remove them into the dry-stove.

5. Stoebe Gomphrenoides. Leaves lanceolate, imbricate, pressed close; head terminating, sessile.—Native of the Cape.

6. Stoebe Scabra. Leaves twisted, pressed close, linear, rugged with tubercles on the outside, tomentose within; flowers in racemes. This has the habit of a Heath in the herb.—Native of the Cape.

7. Stoebe Reflexa. Procumbent: leaves linear; spikes ovate; branches ascending.—Native of the Cape.

8. Stoebe Rhinocerotis. Leaves three-sided, pressed close; branchlets tomentose, drooping; racemes proliferous. This forms the principal food of the rhinoceros, whence its trivial name.—Native of the Cape.

9. Stoebe Disticha. Leaves in bundles, recurved; spikes bifarious.—Native of the Cape.

Stokesia; a genus of the class Syngenesia, order Polygamia-Æqualis.—Generic Character. *Calix:* common ovate, leafy, subimbricate. *Corolla:* floscular, two-formed; corollets hermaphrodite, regular in the disk; in the outer circumference irregular, constituting a ray. *Stamina:* filamenta five, capillary; antheræ cylindric. *Pistil:* germen in the regular florets four-cornered, in the irregular three-cornered; style filiform; stigma two-parted, awl-shaped. *Pericarp:* none. *Seed:* down filamentose, deciduous, equal to the corollet; four in the regular, three in the irregular florets. *Receptacle:* naked. Essential Character. *Corollets:* in the ray funnel-form, longer, irregular. *Down:* four-bristled. *Receptacle:* naked.——The single species known is,

1. Stokesia Cyanea; *Blue-flowered Stokesia.* Stem erect, simple, leafy, about two feet high; lower leaves lanceolate, clasping the stem, toothed at the base; upper sessile, cordate, serrated, all smooth, bright green; flowers large and handsome, of a fine blue colour. The corolla resembles that of Centaurea Cyanus, or Common Bluebottle, with almost the calix of Carthamus, to which genus it is allied. Perennial; flowering in August.—Native of South Carolina. It requires shelter in winter.

Stonecrop. See *Sedum.*

Stone Fern. See *Osmunda Crispa.*

Stonewort. See *Chara.*

Storax-Tree. See *Styrax.*

Stoves or *Hothouses,* are principally intended for preserving such tender exotic plants, where they will not live without artificial warmth in winter. Though there is a great variety of these Stoves, yet they are reducible to two, the Dry Stove and the Bark Stove; both are of comparatively modern invention: the first has only been about an hundred and twenty years in use, and the latter a still shorter period. Before these were invented, German Stoves were introduced into rooms, to warm them. The use of bell-glasses, for covering Melons, began in the reign of Queen Elizabeth; and one improvement succeeded another, till the adoption of Conservatories, or Dry Stoves.—The *Dry Stove* may be either built with upright and sloping glasses at the top, or else the front glasses, which should run from the floor to the ceiling, may be laid sloping, at an angle of forty-five, the better to admit the rays of the sun in spring and autumn, when the sun declines. Mr. Miller always built his Dry Stoves after the model of the Bark Stove, with upright glasses in front, and sloping glasses over them, because this will more readily admit the sun at all different seasons: for in summer, when the sun is high, the top glasses will admit the rays to shine almost all over the house; and the front glasses will answer the same purpose in winter, when the sun is low. Whereas, when the glasses are laid to any declivity in one direction, the rays of the sun will not fall directly on them above a fortnight in autumn, and about the same time in spring, and during the other parts of the year they will fall obliquely; and in summer, when the sun is high, the rays will not reach above five or six feet from the glasses. Besides, the plants placed towards the back part of the house, will not thrive in summer for want of air; whereas, when there are sloping-glasses at the top, which run within four feet of the back of the house, these, by being drawn down in hot weather, will let in air perpendicularly to all the plants: and of how much service this is, every one who has had an opportunity of observing the growth of plants in a stove, will easily judge; for when plants are placed under cover of a ceiling, they always turn themselves toward the air and light, and thereby grow crooked; and, if in order to preserve them straight, they should be turned every week, they will still be poor and sickly. If the situation be dry, the floor of the stove need not be raised more than two feet above the level of the ground; but if it be wet, it will be proper to raise it three feet, especially if the flues are to be carried under the floor; for if these be placed upon the surface, they will not draw so well as when they are more raised. The furnace must be placed at one end of the house, and the size of it may be directed by the kind of fuel intended to be burnt; if for coals or wood, it may be made according to the common method for coppers, only much larger, because as the fire is to be continued chiefly during the night, if there be not room to contain a considerable quantity of fuel, it will want frequent attendance, and consequently there will be great hazard of its being neglected. But if the fuel intended be turf, then the furnace may be the same as will be directed for the Bark Stove. The flues are either carried under the pavement of the floor, or along the back of the house, over each other, and are returned six or eight times the whole length of the stove, according to its height. If they are under the pavement, they may be carried straight, or in a waving line; which latter, some think, will draw better, and they may be so much turned, as to reach almost from the back to the front of the house. The depth should not be less than eighteen inches, and the width nearly equal, which will prevent their being choked up with soot, as is often the case when the flues are made too small. The spaces between the flues should be filled up, either with dry brick rubbish, lime, or sand, from which little moisture will arise. The flues should be closely plastered with loam both within and without, and the upper part covered with a coarse cloth under the floor, to prevent the smoke from getting into the house. When the flue is carried from the furnace to the end of the house, it may be returned in the back above the floor twice, in straight lines, which may be contrived to appear like a step or two, by which means the smoke will be continued in the house until all its heat is spent, which will warm the air of the house better; and the chimneys, through which the smoke is to pass off, may be either at both ends, or in the middle, carried up in the thickness of the brick-work of the flues, so as not to appear in sight in the house. The flues should be first covered with broad tiles, sixteen inches long, and then a bed of sand laid over them, about two inches thick, upon which the other tiles should be laid, to correspond with the rest of the floor. This thickness of cover will be full enough to prevent the too sudden rise of the heat from the flues. But if the furnace be placed under the floor, the thickness of sand between the brick arch which covers it, and the floor, should not be less than four or six inches, so that the bottom of the furnace should be sunk the lower; and if, from the fire-place to the end of the house, the flues be laid a little rising, it will cause them to draw the better; but

this rise must be allowed in the placing them lower under the floor, next the fire; because the floor must be laid perfectly level, otherwise it will appear unsightly. In this stove there should be a stand or scaffold erected, for placing shelves above each other, that the plants may be disposed so as to make a handsome appearance in the house; but these shelves should be made moveable, so as to be raised or sunk, according to the various heights of the plants, otherwise it will be very troublesome to raise or sink every particular plant, according to their heights, or every year as they advance in their growth. In placing the feet of this stand, be careful not to set them too near the fire, nor directly upon the top of the flue, especially that end next the fire; lest, by the constant heat of the tiles, the wood should take fire. The stand should be in the middle of the house, leaving a passage about two feet and a half in the front, and another of the same width in the back, the more conveniently to pass round the plants, in order to water them, and that the air may freely circulate about them. In disposing the plants, the tallest should be placed behind, and the shortest in front, so that there will not be occasion for more than five or six shelves in height at most; but the scaffold should be so contrived, that there may be two shelves in breadth, laid upon every rise, whenever there may be occasion for it, which will save much trouble in disposing the plants.—*The Bark Stove.* These stoves have a large pit, nearly the length of the house, three feet deep, and six or seven feet wide, according to the breadth of the house. This pit is filled with fresh tanners' bark to make a hot-bed, and in this bed the pots of the most tender exotic trees and herbaceous plants are plunged. The heat being moderate, the roots of the plants are always kept in action, and the moisture, detained by the bark, keeps the fibres of their roots in a ductile state; while in the Dry Stove, where they are placed on shelves, they are subject to dry too fast, which is very injurious to the plants. The dimensions of these stoves should be proportioned to the number of plants intended to be preserved, or to the particular plan of the owner; but there should be one fire-place for every forty feet in length. Where there are two fires, it will be proper to make a partition of glass in the middle, and to have two tan-pits, that there may be two different degrees of heat, for plants from different countries. It would be best to build them all in one, only divided by glass partitions, at least the half way towards the front, which will be of great advantage to the plants, because they may have the air in each division shifted, by sliding the glasses of the partitions, or by opening a glass door, which should be made between each division, for the readily passing from one into the other. These stoves should be raised above the level of the ground, in proportion to the dryness of the place, for when built in a moist situation, the whole should be placed on the top of the ground; hence the brick-work in front must be raised three feet above the surface, which is the depth of the bark-bed, whereby none of the bark will be in danger of lying in water, but if the soil be dry, the brick-work in front need not be more than one foot above ground, and the pit may be sunk two feet below the surface. Upon the top of this brick-work, in front, must be laid the plate of timber, into which the wood-work of the frame is to be mortised. This should be of sound winter-felled Oak, one foot wide, six inches deep, and the upright timbers in front must be placed four feet asunder, or somewhat more, which is the proportion of the width of the glass doors or sashes; these should be about six and a half or seven feet long, and placed upright; their dimensions should be nine inches by six, of yellow Fir; but from the top of these ought to come sloping glasses, reaching within three feet of the back of the stove, where a strong crown-piece of timber should be placed, into which a groove for the glasses to slide upon should be inserted. The sloping timbers should be ten inches by nine of yellow Fir; and the crown plate one foot by nine or ten inches of the same timber. The wall in the back part of the stove should be at least thirteen inches thick, but eighteen or twenty-two inches will be better, for the greater thickness there is in the back wall, the more heat will be thrown to the front, whereby the air of the stove will be more thoroughly warmed; the building will also be the stronger, for to this back wall the flues, through which the smoke is to pass, must be joined. This back wall should be carried up about sixteen or twenty feet high, or more, for tall stoves, that they may be of a proper height to support the timbers of the back roof, which covers the shed behind the stove. The roof is fastened into the crown piece before mentioned, which in tall Stoves should be about thirty feet above the surface of the tan-bed; this will give a sufficient declivity to the sloping glasses to carry off the wet, and be of sufficient height to admit many tall plants. The back roof may be slated, covered with lead, or tiled, according to the fancy of the owner; but the appearance of the outside of the building is better expressed by the Plan, than by any written description. In the front of the house, before the tan-bed, there should be a walk about two feet wide, next to which the bark-pit must be placed. The width of the bark-pit should be eight feet, where the width of the house is fourteen. Behind the pit, a walk of two feet wide should be made, to allow room to pass, and water the plants. Then there will be two feet left next the back wall, to erect the flues, which must be all raised above the level of the bark-bed. These flues ought to be one foot wide in the clear, that they may not be too soon stopped with the soot, as well as that they may be easily cleaned. The lower flue into which the smoke first enters from the fire, should be two feet deep in the clear, and covered with broad tiles a foot and half square, or one foot by a foot and half long, that they may be wide enough to extend over the wall in front of the flues, and to take sufficient hold of the back wall: over this the second flue must be returned back again. It may be twenty inches deep, and covered on the top, as before; and so in like manner the flues may be returned over each other six or eight times, that the heat may be spent before the smoke passes off. The thickness of the wall, in front of these flues, need not be more than four inches, or three will do very well, if they be carefully carried up, but it must be well jointed with mortar, and pargeted on the inside, to prevent the smoke from getting into the house. The outside should be faced with mortar, and covered with a coarse cloth, to keep the mortar from cracking, as is practised in setting up coppers. If this be carefully done, there will be no danger of the smoke entering the house, which cannot be too carefully guarded against; for there is nothing more injurious to plants than smoke, which will cause them to drop their leaves, and, if not stopped, will soon destroy them. The fire-place must be made at the end when there is only one; but where the length of the stove requires two, place them at each end of the shed, which must be made the length of the stove, that the fires and the back of the flues may not suffer from the outer air; for it will be impossible to make the fire burn equally, where the wind has full ingress to it, and it will be troublesome to attend it in wet weather, if exposed to rain. The furnace must be adapted to the kind of fuel to be used; but as turf is the best kind of firing, because it lasts longer than any other, the furnace here described is that suited for turf only.

The whole of this furnace should be erected within the house, which will be a great addition to the heat; and the front wall, on the outside of the fire-place next the shed, should be three bricks thick, to prevent the heat from escaping in that direction. The door of the furnace, at which fuel is introduced, should be small, and placed near the upper part, shutting as closely as possible. The furnace must be twenty inches deep, and sixteen square at bottom, but may be sloped off on every side, so as to be two feet square at the top; and under this furnace should be a place for the ashes to fall into, which should be about a foot deep, and as wide at the bottom of the furnace; this should also have an iron door to shut as close as possible, but just over the ash-hole, above the bars which support the fuel, should be a square hole, about four or six inches wide, to let in air to make the fire burn; this must also have an iron frame, and a door to shut close when the fire is perfectly lighted; which will make the fuel last longer, and moderate the heat. The top of this furnace should be nearly equal to the top of the bark-bed, that the lowest flue may be above the fire, to allow a greater draught for the smoke. The furnace should be arched over with bricks. The best are those called Windsor bricks, laid in loam of the same kind as that whereof they have been made, which, when burnt by the fire, will cement the whole together, and become like one brick. Take care that the fire be not placed too near the bark-bed, for then the heat of the fire will by its long continuance dry the bark, and not only destroy its virtue, but render it liable to take fire. Hence it will be the best method to continue a hollow between the brick-work of the fire and that of the pit, about four or five inches wide, which will effectually prevent any damage arising from the heat of the fire; but there ought to be no wood-work near the flues or fire-place, which becoming very dry, must be very liable to take fire. The entrance into this stove should be either from a Green-house, the Dry Stove, or else through the shed, where the fire is made, because in cold weather the front glasses must not be opened. The inside of the house should be clean, and white-washed, because the whiter the back part of the house is; the better it will reflect the light, which is of great consequence to plants, especially in winter, when the stove is obliged to be shut up close. Over the top sliding-glasses there should be either wooden shutters, or tarpaulins, fixed in frames, to cover them in bad weather, to prevent the wet from getting through the glasses, and to secure them from being broken by storms of hail; and these outer coverings will be very serviceable to keep out the frost; and if, in very severe cold, there be a tarpaulin hung before the upright glasses in the front, it will be of great service to the stove, for then much less fire will preserve a heat in the house. In the warmest division, the most tender exotic trees and plants must be placed. Being natives of warm countries, they require to be plunged into the bark-bed, and over the flues there may be shelves made to set the Melon Thistle, the tender sorts of Cereus and Euphorbium, with other very tender succulent plants, which require to be kept dry in winter. As in this stove are placed the plants of the hottest parts of the East and West Indies, the heat should be kept up equal to that marked Anana upon the botanical thermometers, and should never be more than eight or ten degrees cooler at most. Nor should the spirit be raised more than ten degrees higher during the winter, as both extremes are equally injurious. In order to judge more exactly of the temper of the air in the stove, hang the thermometer at a good distance from the fire, and take care that the tube be screened from the sun, for if the sun-beams rest only one hour upon the ball of the thermometer, it will raise the liquor considerably above the real temperature of the stove.—In the management of plants placed in the bark-bed, particular regard must be had to the temper of the bark, and the air of the house, that neither becomes too intensely hot. The plants will require frequent watering, except in cold weather, when it would be very injurious; but the reader will find particular instructions upon this head under the descriptions of the plants themselves. It has been already observed, that in the erection of these stoves, it will be of great service to join them all together, with only one glass partition between them; and wherever several of these stoves and green-houses are required in one garden, it will be very proper to have the green-house in the middle, and the stoves at each end, either placed obliquely or carried on in one straight front. By this contrivance in the structure of these houses, a person may pass from the one to the other of them without going into the open air; which, besides the pleasure to the owner, is also of great use, because there will be no occasion to make a back way into each of them, which must otherwise be done, because the front glasses of the stove could not be opened in cold weather without greatly injuring the plants. But besides the stoves here described, and the green-house, it will be very necessary to have a glass-case or two, wherever there may be great collections of plants. These may be built exactly in the manner described for the stoves, with upright glasses in front, and sloping glasses over the top of them, which should run within four feet of the back of the house. The height, depth, and other dimensions, should be conformable to that of the stoves, which will make a regularity in that of the building. These may be placed at the end of the range on each hand beyond the stoves; and if there be a flue carried along round each of these, with an oven to make a fire in very cold weather, it will save a great deal of labour, and keep the frost out in the severest winters. The upper glasses of these houses should either have shutters of wood, or tarpaulins in frames to cover them in frosty weather; and if there be a contrivance to cover the upright glasses in frost, either with mats, shutters, or tarpaulins, it will be of great use in winter; otherwise the flue must be used when the frost comes on, but that should be done only upon extraordinary occasions, because the design of these erections is to defend such plants as do not require additional warmth, but merely a protection from frost, and a larger share of air than can be conveniently admitted into a green-house. In one of these houses, for instance, may be placed all sorts of Aloes, Mesembryanthemum, African Sedum, Cotyledon, and succulent plants from the Cape of Good Hope. In the other, the different kinds of Arctotis, Osteospermum, Royena, Lotus, and woody or herbaceous plants from the same countries or latitudes. Thus, by contriving the green-house in the middle, and one stove and a glass-case at each end, there will be a conveniency to keep plants from all the different parts of the world, such particularly as will only live in the temperature of their native soil. Whoever desires to have a large collection of plants from different countries, must contrive to have two or three of these stoves, and adapt their heat to the climates from whence the plants placed in them have been brought.—As, however, most of the English stoves are designed for the culture of *Ananas* only, we shall subjoin Mr. Miller's description of two sorts of stoves, which are of the least expense erecting; so that whoever wishes to erect a stove for that purpose, may be able to adapt it to the number of fruit proposed to be annually raised. The first sort of stove, is that which is designed for the plants which produce the fruits the same year; for as they do not generally fruit till the second year, owing to their being taken from

the old plants, whether they be suckers from the side of the plants, or crowns taken from the fruit, if they fruit the succeeding year, their fruit will be small; therefore when they are properly managed, they will not produce their fruit till the second year, by which time they will have obtained strength to produce large fruit, in which their greatest value consists: for although there are several varieties of this fruit which differ, like most other fruits, in degrees of goodness, yet they may all be improved in size without injuring their taste. The larger and better-nourished the fruit is, the finer will be its flavour. In order therefore thus to improve and bring it to the greatest perfection, it will be proper to have a small stove, in which the young plants may be placed, to bring them forward for fruiting in the following autumn, after which they ought to be removed into the larger stove for ripening. The length of this larger stove must be proportioned to the quantity of fruit desired in one season; for as to the width, that should not be much varied; the tan-bed should never be narrower than six, nor more than seven feet wide; for when it is more there must be difficulty in reaching the plants in the middle of the bed, to water or clean them; and if there be room enough on each side of the bed for a walk a foot and half broad, it will be sufficient for persons to water and do every thing which is necessary for the plants. If the stove be made thirty-six feet long in the clear, then the tan-bed may be thirty-three feet, leaving a walk a foot and half wide at each end, which will be sufficient to walk round, attend to, and water the plants. A tan-bed of this size will easily contain eighty fruiting plants, and may be warmed with one fire; but if the stove be built much larger, there must be two fire-places contrived, one at each end, otherwise the air of the house cannot be sustained at a proper degree of heat. The quantity of fuel required for a stove of thirty-six feet long in the clear, is about three chaldron and a half of coals, or in such proportion for any other sort of fuel. But coal, especially pit or Scotch coal, is the best, because the Newcastle coal is very subject to melt and run into clinkers when the oven is very hot; while the Scotch coal burns away with a white ash, and makes but little soot, and will not require the flues to be so often cleaned. The next best fuel is peat, where it can be procured good; but the scent of it is often disagreeable: there are some persons who burn wood, but this requires greater attendance, besides consuming a much greater quantity than of any other kind. The stoves intended for ripening the fruit of the Ananas should have upright glasses in their front, and the front must be high enough to admit a person to walk upright under them on the walk in the front of the house; or where this cannot be admitted, the front wall may be sunk one foot lower than that on the back of the tan-bed, so that the surface of the bed will be a foot above the walk, which will be rather an advantage, as the plants will be so much nearer the glass; and a person may with great ease water and attend the plants when they are thus raised above the walk; therefore when a stove is so situated as that the raising of it high above ground might be attended with inconvenience, the walks quite round the tan-bed might be sunk a foot or eighteen inches below the top of the bed, which will admit of the stove being built so much the lower; for if there is height for a person to walk under the glasses, it will be as much as is required; but as the flues, when returned four times against the back wall, will rise nearly seven feet, so the bottom of the lower flue should be on the same level with the walk, to admit room enough for the whole under the roof. Over the upright glasses there must be a range of sloping glasses running to join the roof, which should come so far from the back wall as to cover the flues and the walk behind the tan-pit; for if the sloping glasses are of sufficient length to reach nearly over the bed, the plants will require no more light; therefore these glasses should not be longer than is absolutely necessary, that they may be the more manageable. The other stove, or Succession House, which is designed for raising young plants until they are of a proper size to produce fruit, need not be built so high as the former. The frames may be made in one slope, without any upright glasses in front. Many persons have formerly made tan-beds with two flues running through the back wall, and covered with glasses made in the same manner as those for common hot-beds, only larger. But as there is no passage into them, the glasses must be taken off when the plants want water: the damps in winter also often rise when they are closely shut; and there is also danger of the tan taking fire, if it should lie too near the fires. Hence, although the small stove, or Succession House, here proposed, is more expensive in building, yet being greatly preferable in other respects, and the after-expense being the same, it has become more general wherever the Ananas are cultivated. Where there is no danger of wet settling in winter about the tan, the bark-pit may be sunk two feet deep in the ground, and raised one foot above the surface. The only walk which is necessary in these stoves is at the back of the bed, and that may be on a level with the surface of the ground; hence the tan-bed will be more than a foot above the walk; and the flues beginning from the level of the walk, there will be room to return them three times, which will warm the air much more with the same fire than when they are carried about twice the length of the stove. In wet land, however, the tan-bed should be wholly raised above the level of the ground, in order to preserve the tan from being chilled by moisture; and in such places the walks at the back should be raised nearly two feet above the level of the ground, because the tan-bed itself ought not to rise much more than one foot above the level of the walk, as, if it be higher, that will render it more difficult to reach the plants when they require water. The brick wall of the pit, on the side next the wall, need not be more than four inches thick so far as rises above the walk, but below that it should be nine inches thick. The reason for reducing the wall above, is to obtain more room for the walk, which would otherwise be too much contracted; and if there be a kirb of Oak laid upon the top of the four-inch wall, it will secure the bricks from being displaced, and sufficiently strengthen the wall, which being but one foot above the walk, will not be in any danger of falling; while upon this kirb there may be two or three upright iron bars fixed with claws, to support the crown-piece of timber, which will secure it from hanging in the middle. There may be more or less of these bars according to the length of the stove, but if they are about ten feet apart, that will be sufficiently near; and an inch square in thickness will be strong enough to answer the design.—*Forcing Stoves.* These do not differ in the manner of their being heated from those already described, but only in their application. The Bark Forcing Stove has a tan-pit, in which pots of Roses, Pinks, Narcissus, and other bulbs, with various choice flowers, are plunged, in order to have them early in spring. Tender annual flowers may be raised in this pit, and pots of Strawberries, Dwarf Cherries, Kidney Beans, &c. may be set either in the pit or the sides of it, or on shelves nearer to the glasses. If the stove be big enough, there may be a border of earth next the back wall, and a small one in front, in which fruit-trees, such as Cherries, Peaches, Nectarines, and Apricots, may be planted in the full ground. Vines also planted on the outside in front may be trained in along the frames of

the upper sashes. This stove has a furnace with flues, and gentle fires must be made in it when the nights are cold, and occasionally during severe weather in the day-time, to keep up an uniform heat. The Dry Forcing-stove has no pit, but furnace and fire-flues only. It is chiefly intended for forcing fruit-trees, as Peaches, Nectarines, Vines, and Figs, early Cherries, and the best sorts of Apricots and Plums, together with Gooseberries, Currants, Raspberries, Strawberries, &c. The whole area is filled with rich earth two feet deep, in which the trees are planted to remain, having been first trained in the open ground till they are in a state for bearing. They are planted in straight or oblique lines from the back to the front, the tallest behind; and are trained against the back wall and front to a trellis, and in the area as espaliers. Pots of Strawberries and Kidney Beans are placed upon shelves near the glasses, and vines are trained in from without along the frames, or on trellis work over the upper glasses. These stoves begin to be worked in January, or early in February. When the fruiting season is past, the upper glasses are removed, to admit air and showers to strengthen the annual shoots of the trees, and so are continued open till winter. It is obvious, that in such a stove, crowded with fruit-trees of different kinds, that require different management, and some more warmth to force them than others, all the trees will not succeed equally well: and the vines trained along the upper glasses will be likely too much to overshade the trees in the area below. Curious and opulent individuals, therefore, have a distinct stove constructed for each sort of fruit, the name of which they give to the stove; as, the Peach-house, the Vinery, &c. But as there is nothing peculiar in their structure, their principles also being the same as the others, there is no necessity here to describe them. Stoves upon various plans, according to the caprice of the owner or builder, have certainly been constructed, but they have rarely equalled, and perhaps never excelled, those now most in use.—*Forcing Frames*, are much used by the nurserymen near London, for bringing forward or forcing early flowers, tender annual plants, dwarf fruit-trees, Strawberries, Kidney Beans, &c. These are from five to fifteen feet wide, from five to ten feet high, and of any convenient length; a wall of brick behind, and a front of glass, either in one slope, or with upright glasses before, and sloping ones above. Dung, bark, or fire, may be applied to heat these forcing-frames. If the first, it is placed chiefly against the back walls and ends, which are then mostly formed of thick planks. If bark or fire be used, the structure and application are much the same as in the Dry and Bark Stoves. Hot walls are forcing-frames worked by fire, and intended to bring forward choice fruits. If it be proposed to have only a single row of trained trees, a border of from four to six in width will be sufficient. The back wall must be eight or ten feet high, with flues running the whole length. In front is to be a wall a foot high with a plate on it, upon which are sloping glass-frames to the top of the back wall; these are most convenient in two ranges, the upper range made to slide. The trees are trained on a trellis within five or six inches of a wall. Along the bottom in the border may be set Strawberries, Dwarf Kidney Beans, Frame Peas, Roses, or any flowers or fruits that do not grow so high as to shade the trees. Such a frame may be worked with one furnace, if it be not more than forty or fifty feet long. Larger forcing-frames differ in nothing but their size from the forcing-frame here described.—For Forcing-Beds, see *Hot-beds*, and the article *Cucumis*. Frames covered with oiled paper instead of glass, are sometimes used for protecting Melons. They may be constructed either like the cover of a waggon, or like the roof of a house. They have a frame of wood at the base, to which in the former, broad hoops are fastened, circularly bent over. The width of the frame should be from five to six feet. The distance between the hoops should not be more than a foot, and there should be two rows of strong packthread or rope-yarn on each side of the arch, running from hoop to hoop, to keep the oiled paper from sinking down with wet. The length of each frame need not be above ten feet, that being the size of a three-light frame; if longer, they will be heavy, and troublesome to move. The other sorts of frame may be made of pantile laths, or slips of deal of those dimensions, fastened into a ridge at the top, and the base-frame at the bottom. The lights may have hinges alternately on each side, that they may be raised occasionally to admit air on the side from the wind, or on all sides in warm weather. When the frames are quite dry, the paper is pasted on. The best paper for this purpose is called Dutch wrapper; for it is strong, and becomes pellucid when oiled all over. After the paste is well dried, the paper should be oiled over on the outside, which, if well done with linseed oil, will be sufficient. The oil should be dry before the frames are exposed to the wet, otherwise the paper will tear. In pasting the paper on the frames, care should be taken to stretch it out very smooth, and to paste it to all the ribs of the frames, and also to the packthreads, to prevent the wind from raising the paper. If the frames be well painted over with the following composition, they will last a long time: To every six pounds of melted pitch, add half a pint of linseed oil, and a pound of brick-dust; mix them well together, and use them warm. This is the best pigment for all timber exposed to the weather, for no moisture can penetrate through it. The covers here described must not be kept too close down over the plants, lest they be drawn up too weak, but air should always be admitted when it can be with safety. These covers of oiled paper are useful not only for Melons, but for covering cuttings of exotic plants, and for many other purposes: the paper will seldom last longer than one season; but if the frames be well made, and when out of use be carefully laid up in shelter, they will last several years, especially if a band of straw be laid round the bed, for the frames to rest upon during the time they are in use.—Hot-houses and Pine-stoves are frequently infested with red spiders, ants, and other insects. To destroy these, the fumes of burning tobacco are applied by means of bellows adapted for that purpose; and when the house is deeply infected, a hole large enough to admit the pipe of the bellows is made in the door, and the smoke is kept in for several hours. This must be repeated two or three times, according to the condition the plants are in; but if some few only are infected, they may be removed into a small room, and fumigated there. Matches also, moistened with a tincture of assafœtida, and then rolled in a powder of brimstone and Scotch snuff in equal quantities, have been recommended to be burnt in the houses, closely shut up. The walls also, with the frames, to be well washed with four ounces of sublimate dissolved in two gallons of water. This wash may be used on old garden walls; and may be applied to the roots of trees to destroy ants, but in that case it must be made weaker.

Stratiotes; a genus of the class Diœcia, order Dodecandria; or class Polyandria, order Hexagynia.—Generic Character. *Male. Calix:* spathe common, two-leaved, three or five flowered; leaflets boat-shaped, compressed, obtuse, converging, keeled, almost equal, permanent; proper of the lateral flowers one-leafed, membranaceous, channelled at the back, opposite to the leaflets of the common spathe, and hidden by them. *Corolla:* petals three, obcordate, from erect spreading, twice as large as the peri-

anth. *Nectaries:* twenty, anthera-shaped, linear-lanceolate, acute, in a ring, inserted into the receptacle. *Stamina:* filamenta twelve, filiform, shorter than the nectaries, inserted into the receptacle; antheræ linear, erect. *Female. Calix:* spathe two-leaved, one-flowered; leaflets boat-shaped, compressed, obtuse, converging, unequal, permanent; perianth as in the male, superior. *Corolla:* as in the male; nectaries as in the male, a little larger. *Pistil:* germen inferior, ovate-hexangular, compressed; styles six, two-parted; stigmas simple, recurved. *Pericarp:* berry ovate, narrowed to both ends, six-sided, six-celled, with a pellucid pulp. *Seeds:* very many, oblong, cylindrical. *Observe.* According to Willdenow, the nectaries are commonly twenty-one or twenty-two, the stamina eleven or twelve: according to Roth, the nectaries are thirty-one, and the stamina commonly thirteen. ESSENTIAL CHARACTER. *Spathe:* two-leaved. *Perianth:* superior, trifid. *Petals:* three. *Berry:* six-celled.——The species are,

1. Stratoites Aloides; *Water Aloe*, or *Common Water Soldier.* Leaves ensiform-triangular, aculeate, serrate. This is a truly stoloniferous and perennial plant, though each root flowers but once. The parent plant, rooted in mud at the bottom of the ditch, after flowering sends out buds of leaves at the ends of long runners, which rise to the surface, form roots, flower, and then sink to the bottom, where they take hold of the mud, sometimes ripen their seeds, and always become in their turn the parents of another race of young offsets. Peduncles several, shorter than the leaves, each bearing one upright white flower, arising from a two-leaved sheath; berry ovate; seeds from ten to twelve in each cell. The pulp in its natural state is clear like the vitreous humour of the eye; in spirits of wine it becomes opaque and white, like the white of an egg when boiled, but when plunged into water it becomes clear again.—Native of the north parts of Europe, and of Siberia. In England it abounds in the fen ditches of the Isle of Ely, and is very common in Lincolnshire, Norfolk, Cheshire, and Yorkshire, flowering in July. In spring the offsets rise and float on the surface, sometimes eight or ten in a circle, and so thick as entirely to fill up the surface of the ditches, and prevent all other plants from growing. A great variety of insects are nourished by this plant, some of whom pursue it down to the bottom of the water, and devour the leaves.—*To propagate it*, procure the young plants in spring, when they first rise on the surface of the water, and place them in canals, ponds, large tubs, or cisterns, where they will strike down their roots, and thrive without care.

2. Stratoites Acoroides; *Indian Water Soldier.* Leaves ensiform, flat, very smooth; spathe bearded at the point. Root creeping, little branched; flowers superior.—Native of Ceylon.

3. Stratoites Alismoides; *Broad-leaved Water Soldier.* Leaves broad-ovate, entire; sheath slightly divided, with several dilated ribs. Root tuberous, perennial; stem none; leaves on long radical footstalks; flower-stalks simple, each bearing a solitary white flower, of very short duration.—Native of ponds in the East Indies and Egypt.

Strawberry. See *Fragaria.*

Strawberry Blite. See *Blitum.*

Strawberry Tree. See *Arbutus.*

Strelitzia; (so called in honour of her late majesty Charlotte Sophia, Queen of Great Britain, of the family of Mecklenburgh Strelitz, and an illustrious patroness of the science of Botany;) a genus of the class Pentandria, order Monogynia.—GENERIC CHARACTER. *Calix:* spathe universal terminating, one-leafed, channelled, acuminate, from spreading declining, many-flowered, involving the base of the flowers; partial spathes lanceolate, shorter than the flowers; perianth none. *Corolla:* irregular; petals three, lanceolate, acute, the lowest boat-shaped, the two upper bluntly keeled; nectary three-leaved; the two lower leaflets a little shorter than the petals, from a broad base, awl-shaped, waved at the edge, folded together, including the genitals, towards the tip behind augmented with a thick appendix, in form of half an arrow-head; the lowest leaflet shorter, ovate, compressed, keeled. *Stamina:* filamenta five, filiform, placed on the receptacle, three in one leaflet of the nectary, two with the style enclosed in the other leaflet; antheræ linear, erect, commonly longer than the filamenta, included. *Pistil:* germen inferior, oblong, obtusely three-cornered; style filiform, length of the stamina; stigmas three, awl-shaped, higher than the nectary, erect, at the beginning of flowering-time glued together. *Pericarp:* capsule subcoriaceous, oblong, obtuse, indistinctly three-cornered, three-celled, three-valved. *Seeds:* numerous, adhering in a double row to the central conceptacle. ESSENTIAL CHARACTER. *Spathes:* universal and partial. *Perianth:* none. *Corolla:* three-petalled. *Nectary:* three-leaved, involving the genitals. *Capsule:* three-celled; cells many-seeded.——The species are,

1. Strelitzia Reginæ; *Canna-leaved Strelitzia.* Leaves parallel-ribbed; scape the length and thickness of the petioles, erect, round, covered with alternate, remote, acuminate sheaths, green, with a purple margin; petals yellow, four inches long. The spathe contains six or eight flowers, which becoming vertical as they spring forth, form a kind of crest, which the glowing orange of the corolla, and the fine azure of the nectary, render truly superb.—Native of the Cape. It may be propagated by seeds, or by the roots; but seeds do not ripen readily in England, and it increases very slowly here by the roots. It has been usually plunged in the tan-pit in a stove; but when the roots are thus confined, the plant rarely or never flowers. When the roots have by accident extended into the rotten tan, it has readily thrown up flowering-stems; the best practice therefore is to let the roots have plenty of earth to strike into. Being a Cape plant, it may probably be found to succeed best in the dry-stove or conservatory.

2. Strelitzia Augusta; *Great White Strelitzia.* Leaves ribbed, netted-veined. Root perennial, with long thick fibres; leaves radical, about six feet long; flowers white.—Native of the Cape.

Streptium; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, oblong, bellied, five-angled, five-grooved, five-toothed, covered with stiff white hairs, permanent, closing, and enlarging with the fruit, which it entirely covers. *Corolla:* one-petalled; tube cylindric, rather longer than the calix, twisted near the apex, a little curved; border five-parted; divisions obovate, equal. *Stamina:* filamenta four, in the upper bent part of the tube, two longer and two shorter; antheræ round, twe-lobed, approaching by pairs. *Pistil:* germen superior, four-lobed; style length of the stamina; stigma large, two-lipped, the upper very short, the under long, broad, recurved. *Pericarp:* drupe dry, two-lobed, hid in the withered inflated closed calix, nut-like, laterally echinate, each lobe bipartite. *Seeds:* one in each division of the nut, oblong, tapering towards the end, a little bent. ESSENTIAL CHARACTER. *Calix:* five-toothed. *Stigma:* two-lipped. *Drupe:* two-lobed, each lobe bipartite.——The only known species is,

1. Streptium Asperum. A plant with a rather shrubby stem: leaves opposite, petioled, cordate, serrate, covered with stiff hooked hairs, from one to three inches long, and

from one to two broad; flowers towards the bottom of the raceme, remote above, approximated, small, white.—Found in the vicinity of Samulcottah, on the terraces of old walls of pagodas. The Telingas call it Obeera.

Strumpfia; a genus of the class Syngenesia, order Monogamia.—Generic Character. *Calix:* perianth one-leafed, five-toothed, superior, very small, permanent. *Corolla:* petals five, oblong, obtuse, spreading. *Stamina:* filamenta none; antheræ five, united into an ovate body. *Pistil:* germen inferior, roundish; style awl-shaped, erect, commonly longer than the stamina; stigma simple, obtuse. *Pericarp:* berry crowned with the calix, roundish, one-celled. *Seed:* one, roundish. Essential Character. *Calix:* five-toothed, superior. *Corolla:* five-petalled. *Berry:* one-seeded.——The only species yet discovered is,

1. Strumpfia Maritima. Leaves in threes, very much resembling those of the Rosemary. It is an upright shrub three feet high; common peduncles axillary, and only half the length of the leaves, sustaining about five small flowers with white petals, and on short peduncles; berries soft and white, the size of a pea. The whole plant has an unpleasant smell.—Native of Curacao, on rocks by the coast.

Struthiola; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* none, unless the corolla be taken for it. *Corolla:* one-petalled, shrivelling; tube filiform, elongated; border four-parted, flat, shorter than the tube; segments ovate; nectary of eight glands, ovate, placed round the throat, surrounded with their proper pencil. *Stamina:* filamenta four, very short, concealed within the tube; antheræ linear. *Pistil:* germen ovate; style filiform, length of the tube; stigma capitate. *Pericarp:* berry coriaceous, ovate, one-celled. *Seed:* one, sharpish. *Observe.* It is allied to *Passerina.* Essential Character. *Corolla:* none. *Calix:* tubular, with eight glands at the mouth. *Berry:* juiceless, one-seeded.——The species are,

1. Struthiola Virgata. Leaves lanceolate, striated, the upper ones ciliate; branches pubescent. This shrub has long rod-like branches, and four-cornered branchlets; flowers sessile, solitary, long, coriaceous, red, silky, tomentose without. It varies with yellow flowers in whitish membranaceous calices, and yellowish antheræ, dark yellow at the tips.—Native of the Cape.

2. Struthiola Nana. Leaves linear, obtuse, hairy; flowers terminating in bundles, tomentose. The bractes are blue.—Native of the Cape.

3. Struthiola Juniperina. Leaves linear, acute, spreading; corollas and calices naked; flowers from the middle of the branchlets almost to the top, white, and fragrant. This is a small shrub, smooth all over; branches slender, round, with four-cornered branchlets; calix smooth, length of the tube of the corolla.—Native of the Cape.

4. Struthiola Erecta. Leaves linear, smooth; branches smooth, four-cornered; flowers at the top of the branchlets, lateral, sessile, within bractes, similar to the leaves, but narrower, solitary.—Native of the Cape.

5. Struthiola Ovata. Leaves ovate, smooth; branches smooth, wrinkled, stiff, round, naked, with four-cornered branchlets; flowers oppositely heaped at the tops of the branches, white, each sessile, within a bracte narrower than the leaves; calix pubescent.—Native of the Cape.

Strychnos; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, very small, deciduous. *Corolla:* one-petalled; tube cylindric; border spreading, five-cleft, acute. *Stamina:* filamenta five, length of the corolla; antheræ simple. *Pistil:* germen roundish; style simple, longer than the stamina; stigma thickish. *Pericarp:* berry brittle, globular, smooth, very large, one-celled, full of pulp. *Seeds:* orbicular, depressed, villose, radiant with villose hairs towards the periphery. Essential Character. *Corolla:* five-parted. *Berry:* one-celled, with a woody rind.——The species are,

1. Strychnos Nux Vomica; *Poison Nut.* Leaves ovate; stem unarmed. It is a middling-sized tree, with the trunk short and crooked, but pretty thick, and the branches irregular; flowers small, greenish-white, collected in small terminating umbels; berry the size of a pretty large apple, covered with a smooth somewhat hard shell, of a rich beautiful orange colour when ripe, filled with a soft jelly-like pulp.—Native of the East Indies, and common in almost every part of the coast of Coromandel; flowering in the cold season. The wood is hard and durable, and is used for many purposes by the natives. It is exceedingly bitter, particularly the root, which is used to cure intermittent fevers, and the bites of venomous snakes. The seeds are employed in the distillation of country spirits, to render them more intoxicating. The pulp of the fruit seems perfectly innocent, being greedily eaten by many sorts of birds. The seed of the fruit is the officinal Nux Vomica: it is about an inch broad, and nearly a quarter of an inch thick, gray, covered with a kind of woolly matter, and internally tough and hard like horn, extremely bitter to the taste, but without any remarkable smell. It chiefly consists of a gummy matter, which is moderately bitter; the resinous part, though very inconsiderable in quantity, is intensely bitter; hence rectified spirit has been considered as its best menstruum. It is classed among the most powerful poisons of the narcotic kind, and proves fatal to dogs in a very short time. Loureiro relates, that a horse died within a quarter of an hour after taking an infusion in wine of the half-roasted seeds. It has also been found to poison hares, wolves, foxes, rabbits, cats, rats, and even birds, as crows and ducks. The effects, however, appear to be rather uncertain, and not always in proportion to the quantity given. With some animals, it operates almost instantaneously; with others, not till after several hours, when laborious respirations, followed by torpor, trembling, coma, and convulsions, usually precede the fatal spasms or tetanus with which life is usually extinguished. From several detailed cases of its mortal effects upon human subjects, we find that the symptoms corresponded nearly with those already ascribed to brutes; and dissections, both of the human subject and of dogs, not shewing any injury done to the stomach or intestines, proves that it acts upon the nervous system, and destroys life by the virulence of its narcotic influence. A single scruple will generally kill a strong dog; a rabbit has been killed by five, and a cat by four grains. It was successfully tried in Sweden for the cure of dysentery; but Bergius says, that it suppressed the flux only for twelve hours. A female, who took a scruple of it night and morning on two successive days, is said to have been seized with convulsions and vertigo, notwithstanding which the dysenteric symptoms returned, and the disorder was cured by other medicines; but she suffered by a pain in the stomach for a long time afterwards. On this account, Bergius concluded that it ought to be administered as a tonic and anodyne only, in doses from five to ten grains, and not till after proper laxatives have been employed. Loureiro recommends it as a valuable internal medicine in fluor albus, and roasted it till it became black and friable, which renders its medicinal use safe, without impairing its efficacy.

2. Strychnos Colubrina; *Snake Poison Nut.* Leaves ovate, acute; tendrils simple. The Indian botanists contend that there is no difference between this and the preceding species.

Many different woods are sent from the E. Indies under the name of Lignum Colubrinum.—Native of the East Indies.

3. Stychnos Potatorum; *Clearing Nut.* Leaves opposite, ovate, acute, quintuple-nerved, veined; cymes axillary. This is a tree, with opposite branches; flowers small, nodding; berry the size of a cherry, dark red, one-seeded. The flowers are very white, pleasant, and aromatic; and the fruit first tastes sweet, but afterwards bitter and astringent. This grows to be a larger tree than the first species, and is much scarcer, being only found among mountains, and in woods of great extent. It flowers during the hot season. The wood is hard and durable, and used for various economical purposes. The pulp of the fruit when ripe is eaten by the natives, but the taste is rather disagreeable. The ripe seeds are dried and sold in every market to clear muddy water, whence it obtained the English name of *Clearing Nut.* The natives of Coromandel never drink clear well water, if they can get pond or river water, which is always more or less impure: one of the seeds is rubbed very hard for a minute or two round the inside of the vessels containing the water. This vessel is generally an unglazed earthen one, and the water is left to settle: in a very short time the impurities fall to the bottom, leaving the water perfectly clear and wholesome. These nuts are constantly carried about by the more provident part of our officers and soldiers in time of war, to enable them to purify their water; as they are more easily procured than alum, and are more wholesome.

Stuartia; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth one-leafed, half five-cleft, spreading; segments ovate, concave, permanent. *Corolla:* petals five, obovate, concave, equal, spreading, large. *Stamina:* filamenta numerous, filiform, united into a cylinder below, shorter than the corolla, connecting the petals at the base; antheræ roundish, incumbent. *Pistil:* germen roundish, hirsute; styles five, simple, filiform, length of the stamina; stigma five-cleft. *Pericarp:* pome juiceless, five-lobed, five-celled, soluble into five closed parts. *Seeds:* solitary, ovate, compressed. Essential Characeer. *Calix:* in five deep segments. *Styles:* simple, with a five-cleft stigma. *Pome:* juiceless, five-lobed, one-seeded, opening five ways.——The species are,

1. Stuartia Malachodendron. Flowers lateral, subbinate; calices ovate, obtuse; styles conjoined. This shrub rises with strong ligneous stalks to the height of five or twelve feet, sending out branches on every side; leaves alternate, on short stalks, elliptic-oblong, two to four inches long, serrated, smooth, and of a fine green above, paler and downy beneath. The flowers are produced from the wings of the stalk: they are white, with one of the segments of a yellowish tinge. It flowers in the latter end of May.—Native of Virginia and Carolina. Sow the seeds, which frequently fail when brought to England, either from not being properly impregnated, or not fully ripened. When the plants come up, they must not be much exposed to the sunbeams, nor to the open air, for they are very difficult to preserve while young. The seeds ought therefore to be sown under glasses; and the surface of the ground, between the plants, should be covered with moss, to keep it moist; and the glasses should be constantly shaded when the sun is bright. With this management the plants will grow, but not fast. This is a hardy plant, except in the early state, when it needs shelter and protection from cold winters, until it becomes inured to the open air, when it may stand constantly in the open shrubby quarters.

2. Stuartia Pentagyna. Flowers solitary, axillary; calices caligulate and lanceolate; styles distinct. This attains the height of six feet.—Native of Carolina and Georgia.

Styrax; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, cylindric, erect, short, five-toothed. *Corolla:* one-petalled, funnel-form; tube short, cylindric, length of the calix; border five-parted, large, spreading; segments lanceolate, obtuse. *Stamina:* filamenta ten, erect, in a ring, scarcely united at the base, awl-shaped, inserted into the corolla; antheræ oblong, straight. *Pistil:* germen superior, three-celled, many-seeded; style simple, length of the stamina; stigma truncate. *Pericarp:* drupe roundish, one-celled. *Seeds:* nuts one or two, roundish, acuminate, convex on one side, flat on the other. Essential Character. *Calix:* of one leaf, inferior. *Corolla:* funnel-form, in five equal segments. *Drupe:* two-seeded.——The species are,

1. Styrax Officinale; *Officinal Storax.* Leaves ovate, villose beneath; racemes simple, shorter than the leaf. Trunk twelve or fourteen feet high, covered with a smooth grayish bark, and sending out many slender branches on every side. The flowers come out from the side of the branches, upon peduncles sustaining five or six flowers in a bunch; they are white, and appear in June. The fruit is a juiceless drupe, of an ovate-globular form.—This shrub is chiefly remarkable for producing the valuable and highly fragrant gum called *Storax.* Although it is indigenous to many parts of the south of Europe, yet the resinous drug which it produces is only to be obtained in perfection from Asiatic Turkey. It issues in a liquid state, from incisions made in the bark of the trunk or branches; and as it was formerly the custom to collect this gum-resin in reeds, it obtained the name of Styrax Calamita. The only kinds now to be found in the shops, are the Pure and Common Storax: the former is usually in irregular compact masses, free from impurities, of a yellowish or reddish-brown appearance, and interspersed with whitish tears, somewhat like Gum Ammoniac or Benzoin; which upon the application of heat melts readily. This has been called Storax-in-the-lump, or Red Storax; and the separate tears, Storax-in-the-tear. The Common Storax is in large masses, very light, and bears no resemblance whatever to that just described: it seems almost wholly composed of dirty sawdust, merely caked together by the resinous matter; and though much less esteemed than the purer kind, yet we are told, that when it is freed from the woody part, it possesses more fragrance, and is superior to the other. Rectified spirit, the common menstruum of resins, readily dissolves the Storax, which may be inspissated to a solid consistence. If infused in water, it imparts to the menstruum a yellow gold colour, some portion of its smell, and a slight balsamic taste. It impregnates water considerably in distillation, and strongly diffuses its fragrance when heated, though it scarcely yields any essential oil. The spirituous solution, gently distilled off from the filtered reddish liquor, brings over with it very little of the fragrance, and the resin which remains is more fragrant than the finest Storax-in-the-tear. The pure resin distilled without addition, yields, along with an empyreumatic oil, a portion of saline matter, similar to the flowers of Benzoin, and sometimes a substance of the same nature may be extracted by boiling it in water. With some of the ancients, this drug was a familiar remedy as a resolvent, and particularly in catarrhal complaints, coughs, asthmas, and menstrual obstructions. From its affinity to the Balsams, it was also prescribed in ulcerations of the lungs, and other stages of pulmonary consumption; and is by some still prescribed in disorders of the breast.—*Propagation.* This plant may be propagated by sowing the seeds in pots filled with fresh light earth, and plunged into a moderate hot-bed. This should be done as soon after the seeds are procured as possible, for if

sown in the latter end of summer, in pots kept in a moderate hot-bed of tanners' bark all the winter, the plants will come up in the sueceeding spring; whereas those sown in the spring, often remain in the ground a whole year. When the plants are come up, they should be hardened gradually to the open air, into which they ought to be removed in June, placing them in a sheltered situation, and observing to weed and water them in dry weather. In this place they may remain till autumn, when they should be placed under a common hot-bed frame, where they may be screened from hard frost in winter, but in mild weather enjoy the free air as much as possible. Their leaves fall off in autumn; and in the spring, before they begin to shoot, they ought to be taken out of the pots, and their roots carefully parted, and be each replanted in a separate small pot, filled with light fresh earth, and plunged into a very moderate hot-bed; observing to water and shade them until they have again taken firm hold. Then inure them gradually to the open air till June, when they may be placed abroad, in a warm situation, and remain there till the end of October, when they must be removed into shelter for the winter. They are tolerably hardy, and only require to be sheltered from severe frost while young. When they have grown three or four years in the pots, and are become strong, some of them may be turned out, and planted in the full ground, against a south wall, to which their branches should be trained in the same manner as fruit-trees: in this situation they will bear the cold of our ordinary winters; but in severe frost, it will be proper to cover the branches with mats, straw, or other light things.

2. Styrax Grandifolium; *Large-leaved Storax.* Leaves obovate, villose beneath; lower pedunoles axillary, solitary, one-flowered.—Native of South Carolina.

3. Styrax Benzoin; *Benzoin Storax*, or *Benjamin Tree.* Leaves oblong, acuminate, tomentose beneath; raeemes compound, length of the leaves. This tree rises quickly to a considerable height, and sends off many strong, round, leafy branches, which are covered with a tomentose or whitish downy bark.—In Sumatra, where it is a native, this tree is reckoned of a suffieient age when it has stood six years, or the trunk is about seven or eight inches in diameter, to afford the Benzoin. The bark is then cut through longitudinally, or somewhat obliquely, at the origin of the principal lower branches, from which the drug exudes in a liquid state, and by exposure to the sun and air soon concretes, when it is scraped off from the bark with a knife or chisel. The quantity which one tree affords, never exceeds three pounds; nor are the trees found to sustain the effeets of these annual incisions longer than ten or twelve years. The Benzoin, which issues first from the wounded bark, is the purest, being soft, extremely fragrant, and very white; that which is less esteemed, is of a brownish colour, very hard, and mixed with various impurities. In Arabia, Persia, and other parts of the East, the coarsest sort is consumed in fumigating and perfuming the temples, and in destroying insects. The Benzoin sold by the druggists in large brittle masses, is composed partly of white, partly of yellowish or light brown, and often also of darker-coloured pieees; that which is clearest, and contains most white matter, is most esteemed. It has very little taste, only impressing upon the palate a slight sweetness; but its smell, especially when rubbed or heated, is extremely fragrant and agreeable. It totally dissolves in rectified spirit, the impurities excepted, into a deep yellowish-red liquor, and in this state discovers a degree of warmth and pungency, as well as sweetness. It imparts by digestion, to water also, a considerable share of its fragrance, with a slight pungency: the filtered liquor, gently exhaled, leaves not a resinous or mucilaginous extract, but a crystalline matter, seemingly of a saline nature, amounting to one-tenth or one-eighth of the original weight. Exposed to the fire in proper vessels, it yields a quantity of a white saline concrete, called *flores benzoes*, of an acidulous taste, and grateful odour, soluble in rectified spirit, and in water by the assistance of heat. As the trees which afford Benzoin and Storax are congeners, and as their resinous products are very similar in their external appearances, and not widely differing in their sensible qualities, it is reasonable to suppose that they are analogous in their medicinal effects. Benzoin, however, though rarely employed in a simple state, has been frequently prescribed as a pectoral, and recommended for inveterate coughs, asthmas, obstructions of the lungs, and phthisical complaints, where there is not much fever. Dr. Cullen says, that the flowers are manifestly a saline substance of the acid kind, possessing considerable acrimony and stimulant power; and observes, that in asthmas he found it to be hurtful given in doses of half a drachm only. Meyriek observes, that the principal use of Gum Benjamin is in perfumes, and to beautify the skin. It is, however, an excellent medicine in the asthma, and other disorders of the breast and lungs, which it relieves by removing obstructions in those parts, and promoting expectoration: for these purposes, the preparation known in the shops by the name of Flowers of Benjamin, is most effectual, and may be taken with safety to the amount of fifteen grains, or a scruple, for a dose. The same preparation snuffed up the nose, provokes sneezing, and a large discharge of mucus from the head. The manner of preparing it for a cosmetic, is to make a tincture of the gum with rectified spirits of wine, in the proportion of four ounces of the former to a pint of the latter. The ingredients must be set in a warm situation for the space of three or four days, and then strained or filtered through paper. One ounce of this tincture put into twenty times the quantity of water, gives it a milky colour and consistence; from which circumstance the mixture has aequired the appellation of Virgin's Milk; a little of which, being rubbed on the face and arms every day with a soft linen rag, makes them agreeably smooth, and removes blotches, spots, and other eruptions, which discolour the skin, and render it unsightly.—For its propagation and culture, see the first speeies.

4. Styrax Lævigatum; *Smooth Storax.* Leaves oblong, smooth on both sides; peduneles axillary, one-flowered, solitary, or two together. It flowers in June and July.—Native of South Carolina.

Suber. See *Quercus.*

Subularia; a genus of the class Tetradynamia, order Siliculosa.—Generic Character. *Calix:* perianth four-leaved; leaves ovate, concave, spreading a little, deciduous. *Corolla:* four-petalled, cruciform; petals obovate, entire, a little bigger than the calix. *Stamina:* filamenta six, shorter than the corolla, two of which are opposite and still shorter; antheræ simple. *Pistil:* germen ovate; style shorter than the silicle; stigma obtuse. *Pericarp:* silicle ovate; subcompressed, entire, with a very short style, two-celled; partition contrary to the valves; valves ovate, deeply concave. *Seeds:* very minute, roundish. Essential Character. *Silicle:* entire, ovate; valves ovate, concave, contrary to the partition. *Style:* shorter than the silicle.——The species are,

1. Subularia Aquatica; *Awlwort.* Leaves all radical, smooth, awl-shaped, with a recurved point. Stalk seldom more than two inches high, simple, smooth, bearing a cluster of small white flowers, which are always immersed in water, and so closed that the impregnation is accomplished in safety, under the protection of the calix and petals; seeds

ovate, compressed, about three in each cell. By the appearance of the flower and seed-vessels, this little plant might be taken for a *Draba;* but on examination, an essential difference is found, in the partition being contrary to the valves, not parallel with them, and yet those valves are not keeled, as in *Lepidium*, only concave; neither is the silicle notched, as in that genus. It is therefore no less remarkable for the peculiarity of its generic character, than for its situation and mode of flowering under water.—Native of the northern parts of Europe, flowering under water in July. Found also in Ireland, in the gravelly bottom of Lough Neagh; in Loch Carran and Loch Tay, Scotland; and near Llanberys, Llyn y Cwn, and Ffynnonfrech, near Snowden; and Llyn Ald, Denbighshire, North Wales.

Succory. See *Cichorium.*

Succory Hawkweed. See *Crepis.*

Sugar-Cane. See *Saccharum.*

Sugar Maple. See *Acer.*

Sulphurwort. See *Peucedanum.*

Sultan, Sweet. See *Centaurea.*

Sumach. See *Connarus, Coriaria,* and *Rhus.*

Summer Cypress. See *Chenopodium Scoparia.*

Sun Dew. See *Drosera.*

Sun-flower. See *Helianthus.*

Sun Spurge. See *Euphorbia.*

Supple Jack. See *Paullinia.*

Suriana; a genus of the class Decandria, order Pentagynia. —Generic Character. *Calix:* perianth five-leaved; leaflets lanceolate, acuminate, permanent. *Corolla:* petals five, obovate, length of the calix, spreading. *Stamina:* filamenta ten, filiform, shorter than the corolla; antheræ simple. *Pistil:* germen five, roundish; styles solitary, filiform, erect, length of the stamina, inserted into the middle and inner side of the germen; stigmas obtuse. *Pericarp:* none. *Seeds:* five, roundish. Essential Character. *Calix:* five-leaved. *Petals:* five. *Styles:* inserted into the inner side of the germina. *Seeds:* five, naked.——The only species known is,

1. Suriana Maritima. Root perennial; stem shrubby, five or six feet high; branches erect, glaucous. Leaves clustered in bundles, towards the ends of the branchlets, erect, wedged, bluntish, short, nerveless, veinless, thickish, villose, pubescent, pale-green, on very short petioles; flowers small and yellow.—Native of the sea-coast of South America, and the islands of the West Indies. Browne says, it is frequent by the sea-side, in the parish of St. James, in Jamaica. Sow the seeds on a hot-bed early in the spring: when the plants come up, weed them, and refresh them frequently with water. In warm weather, raise the glasses to admit fresh air. When the plants are fit to remove, take them up carefully, and set each in a small pot filled with light fresh earth; plunge them into the tan-pit, shading them until they have taken new root, after which water them every evening in hot weather, and admit fresh air in proportion to the warmth of the season. They must be kept very warm in winter, especially while young. These plants make slow progress the first year, but afterwards will grow pretty freely.

Swallowwort. See *Asclepias.*

Swartzia; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, inferior, coriaceous, coloured internally, four or five parted, permanent; segments ovate, sharpish, reflexed, almost equal. *Corolla:* petal one, lateral, erect, roundish, fringed, with a short claw. *Stamina:* filamenta numerous, longer than the calix, ascending, united at the base, inserted into a semicircular receptacle, awl-shaped, some of them, which are opposite to the petal, shorter and imperfect; antheræ roundish, flat, emarginate above and below, fastened by the back; on the longer filamenta larger and oval. *Pistil:* germen oblong, compressed, villose, placed on a thickish declining pedicel; style none; stigma oblique, acute. *Pericarp:* capsule coriaceous, obliquely ovate, pedicelled, one-celled, two-valved. *Seeds:* few, ovate, covered at the base with a pulpy pitcher-shaped oblique aril, and pedicelled. Essential Character. *Calix:* four-leaved. *Petal:* single, lateral, flat. *Legume:* one-celled, bivalve. *Seeds:* arillated. ——The species are,

1. Swartzia Simplicifolia. With simple leaves, and roundish ovate petals, larger than the calix, and polyandrous flowers. A shrub, ten feet high, with alternate, round, smooth, leafy branches, dotted with whitish elevated points; flowers yellow, fragrant.—Native of woods in the Caribbee islands.

2. Swartzia Grandiflora. With simple, oblong-ovate leaves; subtriflorous footstalks; round, reniform, very large petals; and oblong legumes. This is so like the preceding, that they can hardly be distinguished: the leaves are rather narrower.—Native of the island of Trinidad.

3. Swartzia Dodecandra. With simple leaves; dodecandrous flowers; and oblong petals, of the length of the cup. —Native of South America.

4. Swartzia Triphylla. With ternate leaves, and margined footstalks. This is a middle-sized tree, rising to the height of eight or ten feet or more, and branching towards the top; leaves alternate and digitated, with three of the leaflets sessile, and annexed to the flat midrib; flowers corymbose and axillary; petals yellow.—Native of the Caribbee islands.

5. Swartzia Pinnata. With pinnate leaves, and round common footstalks, which sufficiently distinguish it from the other species.—Native of Trinidad.

6. Swartzia Alata. With pinnate leaves, and winged common footstalk. This tree is about twenty-five feet high, with wide spreading branches which are round and leafy; flowers very small.—Native of Guiana.

Sweet Brier. See *Rosa.*

Sweet Fern. See *Scandix.*

Sweet Flag and *Rush.* See *Acorus.*

Sweet Gum. See *Liquidambar.*

Sweet Maudlin. See *Achillea.*

Sweet Pea. See *Lathyrus.*

Sweet Sultan. See *Centaurea.*

Sweet William. See *Dianthus.*

Sweet Willow. See *Myrica.*

Swertia; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* perianth five-parted, flat, permanent; segments lanceolate. *Corolla:* one-petalled, wheel-shaped; border flat, five-parted; segments lanceolate, bigger than the calix, with the claws connected; nectaries ten, as it were two dots in the base of each segment of the corolla, within excavated, girt with small erect bristles. *Stamina:* filamenta five, awl-shaped, from erect spreading, shorter than the corolla; antheræ oblong, incumbent. *Pistil:* germen ovate-oblong; style none; stigmas two, simple. *Pericarp:* capsule round, acuminate at both ends, one-celled, two-valved. *Seeds:* numerous, small, fastened to the suture of the capsule. *Observe.* In the fourth species the nectaries project beneath the horns; and in it, and the fifth and sixth species, the flowers are four-cleft. Essential Character. *Corolla:* wheel-shaped, with two nectariferous pores at the base of each segment. *Capsule:* one-celled, two-valved. *Seeds:* numerous, inserted into the margins of the valves. ——The species are,

1. Swertia Perennis; *Marsh Swertia* or *Felwort.* Corollas

five-cleft; peduncles four-cornered, awl-shaped; stem undivided; root-leaves oval; flowers cinereous purple, of a dull colour, and void of scent. This is a handsome plant, with a perennial root, composed of long whitish fibres.—Native of Germany, Austria, Switzerland, France, and Siberia, in alpine bogs. It flowers in August; and though found in Wales, is a doubtful native of Britain. Like all its congeners, it grows in swamps. They seldom seed in this country, and are propagated by parting the roots; the best time for doing which is in September, that they may have time to root and acquire strength before the frosts come on. They require a loose moist soil, and shady situation.

2. Swertia Difformis. Corollas five-cleft, the terminating one six-cleft; peduncles very long; leaves linear. The flowers are white.—Native of bogs and cedar swamps in North America.

3. Swertia Decumbens. Corollas five-parted; leaves linear-lanceolate; nectaries ten, bristly. Stem filiform, branched at the top, obscurely angular, very smooth, as is the whole plant; corolla white.—Native of Arabia Felix.

4. Swertia Corniculata. Corollas four-cleft, four-horned. Root annual, short, attenuated, cruciate, with four lateral fibres; stem erect, round, slightly angular, leafy; leaves ovate lanceolate. It varies in size from a span long, and almost simple, to two feet, many-stemmed, and more branched.—Native of Siberia, where, for its grateful bitterness, it is received among the domestic remedies of the inhabitants: it is common on both sides of the river Jenisca, in sandy moistish Pine-woods; and in some parts occurs of a lower stature, with larger seeds and more turgid flowers. In Kamptschatka, it is hardly above two inches high, with a simple one-flowered stem, and only two or three pairs of leaves. It is also found in Canada; and flowers in July.

5. Swertia Dichotoma. Corollas four-cleft, hornless; peduncles nodding; leaves ellliptic; stem branched. Root simple, drawing to a point, stouter than the preceding species, and apparently biennial: it is slightly bitter.—This flowers in May and June; and is a native of eastern Siberia.

6. Swertia Tetrapetala. Corollas four-cleft, hornless; peduncles erect; leaves lanceolate; stem simple. It is six inches high; flowers small, blue; root simple, slender, attenuated, annual.—Native of Kamptschatka.

7. Swertia Fastigiata. Corollas campanulate-rotate, of the length of the calix; flowers fastigiate-aggregate, axillary, terminal, sky-blue; pedicels two together; leaves spathulate-obovate, nervose; stem branchy.—Grows on the Missouri flats, near the Rocky Mountain.

8. Swertia Pusilla. Corollas rotated, as long again as the calix; stem very simple, one-flowered; leaves oblong.—Grows on the alpine regions of the White hills of New Hampshire. The whole plant, Pursh observes, is scarcely an inch high, with one or two pair of small leaves, and a considerably-sized blue flower. Divisions of the corolla oblong and acuminate, and those of the calix obtuse. In the Banksian Museum are specimens from Labrador, agreeing in every respect with the New Hampshire plant.

Swietenia; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, obtuse, very small, deciduous. *Corolla:* petals five, obovate, obtuse, concave, spreading; nectary one-leafed, cylindric, length of the petals; mouth ten-toothed. *Stamina:* filamenta ten, very small, inserted below the teeth of the nectary; antheræ oblong, erect. *Pistil:* germen ovate; style awl-shaped, erect, length of the nectary; stigma headed, flat. *Pericarp:* capsule ovate, large, woody, one-celled, at the top five-celled, five-valved; valves opening at the base. *Seeds:* very many, imbricate, compressed, oblong, obtuse, having a leafy wing. *Receptacle:* large, five-cornered. *Observe.* It is allied to *Cedrela* by the fruit. Essential Character. *Calix:* five-cleft. *Petals:* five. *Nectary:* cylindric, bearing the stamens at the mouth. *Capsule:* five-celled, woody, opening at the base. *Seeds:* imbricate, winged.—— The species are,

1. Swietenia Mahagoni; *Mahogany Tree.* Leaves pinnate, about four-paired; leaflets ovate-lanceolate, equal at the base; panicles axillary. This is a lofty and very branching tree, with a wide handsome head; flowers small and whitish; capsules large, sometimes the size of a child's head. Linneus remarks, that this tree has a great affinity with the Barbadoes Cedar.—It is a native of the warmest parts of America, and grows plentifully in the islands of Cuba, Jamaica, Hispaniola, and the Bahamas. Cuba and Jamaica formerly produced trees of a very large size, which could be cut into planks of six feet breadth. Those on the Bahama islands are not so large, but they are often four feet in diameter, and rise to a great height, although they are generally found on the solid road, where there appears to be scarcely any earth for their nourishment. The wood supplied by the Bahamas has generally passed under the name of Madeira Wood. The Spaniards use it for ship-building, for which purpose it is better adapted than most woods yet known, being very durable, resisting gun-shots, which it buries without splintering, and is not so readily attacked by the worm as Oak. Browne informs us, that Mahogany was formerly very common in Jamaica, and while it could be had in the low-lands, and brought to market at an easy rate, furnished a considerable branch of the exports from that island. He observes, that it thrives in moist soils, and varies with different lands both in grain and texture: that which grows upon rocks being smaller, but very hard and weighty, of a close grain, and beautifully shaded; while the produce of the low and richer lands is observed to be more light and porous, of a paler colour, and open grain. The tree, he adds, grows very tall and straight, and generally bears a great number of capsules with reddish or saffron-coloured flowers, and fruit about the size of a turkey's egg. The wood is a very strong timber, and answers very well in beams, joists, planks, boards, and shingles; for all of which it has been anciently used in Jamaica. In England the excellency of this wood for all domestic purposes has been long well known; it is universally in use, and forms a principal article of our foreign timber trade.—In the Bahamas this valuable tree is suffered to propagate in the following manner. When the fruit is ripe, the outer hard shell separates next the footstalk, and thereby exposes the seeds, which being broad and light, are soon dispersed on the surface of the rocks. Such of them as fall into the fissures, very soon send forth roots; and if these tender fibres meet with resistance from the hardness of the rocks, they creep along the surface, and seek another fissure, into which they pierce, and swell so as to break the rock, and thereby make way for the root to penetrate deeper. In England it is propagated by seeds procured from the Bahama islands; those imported from Jamaica being seldom successful. Sow the seeds in small pots filled with light sandy earth, and plunge them into a hot-bed of tanners' bark, giving them a gentle watering once a week; if the seeds be good, the plants will appear in a month or five weeks; and when they are two inches high, fill a sufficient number of small pots with light earth, and plunge them into the tan-bed a day or two, that the earth may be warmed before the plants are put into the pots; then shake out the young plants, carefully separating them so as not to tear their roots, and

plant each singly in the pots, shading them till they have taken fresh root; after which treat them in the same manner as directed for other West India plants, taking care to water them, but sparingly, especially in winter, and also, when they are shifted, to preserve the earth to their roots.

2. Swietenia Febrifuga. Leaves pinnate, about four-paired; leaflets elliptic, roundish, emarginate, unequal at the base; panicle terminating, divaricate. A lofty tree, with numerous branches, the lower ones spreading, the upper ascending. The bark is externally gray and scabrous, internally of a light red colour: a decoction of it dyes brown of various shades, according as the cloth has been prepared. Its taste is a bitter and astringent united, and very strong, particularly the bitter, at the same time not in any way nauseous or offensive. The wood is of a dull red colour, remarkably hard and heavy. The Telingas, who call this tree *Soymicla*, reckon it the most durable wood they know, and on that account is used for all the wood-work in their temples; it is also very serviceable for various other purposes.—Native of India.

3. Swietenia Chloroxylon. Leaves pinnate, many-paired; leaflets halved, cordate, obtuse; panicle terminating, spreading. This is a middling-sized tree, with large spreading branches, the trunk tolerably erect; flowers numerous, small, yellow. The wood is of a deep yellow colour, remarkably close-grained, heavy and durable: it is used for various economical purposes, and comes nearer to Box-wood than any other.—Native of the mountainous part of the Circars, flowering at the beginning of the hot season. It is the *Billoo* of the Telingas.

Swine's Cress. See *Cochlearia Coronopus.*

Sycamore. See *Acer* and *Ficus.*

Syena; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth three-leaved; leaflets linear-lanceolate, acute, spreading, permanent. *Corolla:* petals three, roundish, concave, spreading, length of the calix. *Stamina:* filamenta three, capillary; antheræ oblong. *Pistil:* germen superior, roundish; style filiform; stigma trifid. *Pericarp:* capsule globular, crowned with the style, one-celled, three-valved. *Seeds:* six, globular, striated, two fastened to each valve, one above the other. *Observe.* Allied to *Commelina.* Essential Character. *Calix:* three-leaved. *Petals:* three. *Capsule:* one-celled, three-valved.——The only species is,

1. Syena Fluviatilis. Leaves capillaceous, in whorls; flowers axillary, white, peduncled, solitary; stem somewhat branched, decumbent.—This minute mossy plant is a native of Guiana, where it is found in rivulets.

Symphonia; a genus of the class Monadelphia, order Pentandria.—Generic Character. *Calix:* perianth five-leaved, permanent; leaflets roundish, very small, spreading. *Corolla:* petals five, roundish, subcoriaceous, concave, converging into a depressed globe. *Stamina:* filamenta cylindric, sheathing the style; antheræ five, ovate, acute, spreading, alternate with the stigmas. *Pistil:* germen ovate; style cylindric, a little longer than the corolla; stigmas five, oblong, acute, spreading. *Pericarp:* berry five-celled, globular. *Seeds:* solitary, subglobular, smooth, flatter internally. Essential Character. One-styled. *Corolla:* globular, five-petalled. *Berry:* five-celled. *Seed:* solitary.——The only discovered species is,

1. Symphonia Globulifera. Leaves at the end of the branchlets, approximating, oblong-lanceolate, quite entire, very smooth, keeled underneath, with a blunt rachis. This is a tree, with a thick lofty trunk; flowers red, four or five, in a simple terminal umbel. The seeds are very grateful to parrots.—Native of Surinam.

Symphytum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, erect, five-cornered, acute, permanent. *Corolla:* one-petalled, bell-shaped; tube very short; border tubular, bellying, a little thicker than the tube; mouth five-toothed, obtuse, reflexed; throat fenced by five lanceolate rays, spinulose at the edge, shorter than the border, converging into a cone. *Stamina:* filamenta five, awl-shaped, alternate with the rays of the throat; antheræ acute, erect, covered. *Pistil:* germina four; style filiform, length of the corolla; stigma simple. *Pericarp:* none; calix larger, widened. *Seeds:* four, gibbous, acuminate, converging at the tips. Essential Character. *Corolla:* border tubular, ventricose; throat closed by lanceolate rays. *Calix:* five-parted. *Seeds:* four, naked.——The species are,

1. Symphytum Officinale; *Common Comfrey.* Leaves ovate-lanceolate, decurrent. Root perennial, fleshy, mucilaginous, externally black; stem two or three feet high, upright, leafy, winged, hispid with deflexed hairs; clusters of flowers in pairs on a common stalk, with an odd flower between them, recurved, dense, hairy; corolla yellowish-white, sometimes purple, the rays down at each edge. Comfrey is a plant which possesses considerable medical properties, though they are but little regarded. The root abounds in a pure, tasteless mucilage, and is useful in irritations of the throat, intestines, and, above all, the bladder. A conserve of the roots cures the whites, and a decoction of them is excellent in coughs and soreness of the breast. Dried and powdered, they are good against fluxes of the belly, attended with griping pains and bloody stools. It is also serviceable in defluxions on the lungs, spitting of blood, and other disorders of the breast. Bruised and applied to foul ulcers, it cleanses and disposes them to heal. It removes the inflammation, eases the pain, and stops the bleeding of the piles, and is of considerable efficacy in ulcerations of the kidneys and urinary passage, particularly if occasioned by the use of cantharides, or Spanish flies. The leaves are frequently employed to give a grateful flavour to cakes and panada, and when boiled are esteemed by many a very great delicacy. The variety with a red or purple flower is more common in many parts of the continent than in England. Mr. Miller asserts, that the difference in colour is permanent in the plants raised from seeds; and that the purple and whitish-yellow flowers are never found mixed, where the plants grow wild.—It is a native of Europe, and also of Siberia: common in watery places on the banks of rivers and ditches, flowering from the end of May to September.—*Propagation.* This and the following species may be cultivated by sowing the seeds in the spring, or by parting their roots in the autumn, when almost every piece of a root will grow. They should be planted about two feet and a half asunder, and will require no further care but to keep them clear from weeds; for they are hardy enough for any soil or situation.

2. Symphytum Tuberosum; *Tuberous-rooted Comfrey.* Leaves ovate, semi-decurrent, the uppermost opposite. This is suspected to be a variety of the preceding species. It is a lower plant, with the root white on the outside; clusters in pairs, terminal; flowers yellowish or greenish-white, cylindrical. It flowers from May to October.—Native of Germany, Austria, France, Spain, and Italy, and observed in various parts of Scotland.

3. Symphytum Orientale; *Eastern Comfrey.* Leaves ovate, subpetioled. Root perennial; stalks two feet high; flowers in bunches like the first species, but blue. They appear in March, but seldom produce seeds in England.—Found growing by the sides of rivulets near Constantinople.

4. Symphytum Asperrimum; *Prickly Comfrey.* Stems prickly; leaves oval, acute, stalked, the floral ones opposite; clusters in pairs. This species is the largest of the genus, rising to five feet; and is an hardy ornamental perennial. Flowers of a rich blue colour.—Native of Caucasus, flowering through the summer.

Symplocos; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-cleft, small; segments roundish, erect. *Corolla:* petals five to ten, oblong, obtuse, erect, spreading very much above. *Stamina:* filamenta very many, awl-shaped, flat, shorter than the petals, growing in four rows to the tube of the corolla, the lower ones shorter; antheræ roundish. *Pistil:* germen superior, roundish; style filiform, length of the stamina; stigma headed, subtrifid. *Pericarp:* drupe five-celled. *Seeds:* several. Essential Character. *Calix:* five-cleft. *Corolla:* five-petalled, or from five to ten, united at the base. *Stamina:* in four rows, growing to the tube of the corolla. *Fruit:* five-celled.—— The species are,

1. Symplocos Martinicensis. Peduncles subracemed; leaves very smooth, crenulate. A branching tree twenty-five feet high; flowers white, smelling like those of Hawthorn. —Native of the woods of Martinico, flowering in November.

2. Symplocos Ciponima. Peduncles many-flowered; leaves entire, villose beneath. A middle-sized tree. The shoots are very villose.—Native of Guiana.

3. Symplocos Arechea. Peduncles about five-flowered; leaves serrate, almost naked. This is intermediate between the two former.—Native of the woods of Peru.

4. Symplocos Octopetala. Flowers eight-petalled. A tree upwards of twenty feet high, with smooth brittle branches; leaves bright green; flowers the size of a lemon-blossom, white, fragrant; fruit the size of a filbert.—Native of Jamaica.

Syrian Rue. See *Peganum.*

Syringa; a genus of the class Diandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, tubular, small; mouth four-toothed, erect, permanent. *Corolla:* one-petalled, funnel-form; tube cylindric, very long; border four-parted, spreading, and rolled back; segments linear, obtuse. *Stamina:* filamenta two, very short; antheræ small, obtuse, within the tube of the corolla. *Pistil:* germen oblong; style filiform, length of the stamina; stigma bifid, thickish. *Pericarp:* capsule oblong, compressed, acuminate, two-celled, two-valved; valves contrary to the partition. *Seeds:* solitary, oblong, compressed, acuminate at both ends, with a membranaceous edge. Essential Character. *Calix:* four-toothed. *Corolla:* tubular, four-cleft. *Capsule:* two-celled, two-valved.——The species are,

1. Syringa Vulgaris; *Common Lilac.* Leaves ovate, cordate. This universally admired shrub grows to the height of eighteen or twenty feet in good ground. It divides into many branches, and the flowers are always produced at the ends of the shoots of the former year, and below the flowers other shoots come out to succeed them; for that part upon which the flowers stand, decays down to the shoots below, every winter. The panicles of flowers grow erect, and being intermixed with the green leaves have a fine effect; and if their fragrancy be also considered, this may be ranked among the most beautiful decorations of our gardens, where it has been long cultivated. The flowers appear early in May, or towards the end of April, and will continue three weeks when the season is cool; but soon fade in hot seasons. There are three varieties, which not only differ in the colour of their flowers, but also in that of their shoots and leaves: one has white, another blue, and the Scotch Lilac (the most beautiful of the three) purple flowers.—This shrub is supposed to grow naturally in some parts of Persia, but is so hardy as to resist the greatest cold of this country. It may be propagated by seeds, by suckers, or by layers. If the seeds be sown soon after they are ripe, the plants will come up in the following spring, but as the roots send out great plenty of suckers annually, few persons take the trouble of raising it from seeds, though the plants raised from seed are less liable to send out suckers, and generally flower in the third year. It thrives best upon a light rich soil, such as the gardens near London are for the most part composed of; and there they grow to a much larger size, when they are permitted to stand unremoved, than in any other part of England. In strong loam, or chalk, they make no progress. If the suckers be small when taken from the old plants, they should be planted in a nursery in rows three feet asunder, and one foot distance in the rows, where they may stand a year or two to get strength, and then they should be removed to the places where they are to remain. The best time to transplant them is in autumn. There is a variety or two with blotched leaves; but these variations being the effect of weakness, whenever the shrubs become healthy their verdure returns again.

2. Syringa Chinensis; *Chinese Lilac.* Leaves ovate-lanceolate; stem shrubby. This is of a much humbler stature than the first species: the panicles are more lax, and composed of larger flowers. Hardy, flowering in May and June. —Supposed to be a native of China.

3. Syringa Persica; *Persian Lilac.* Leaves lanceolate. This shrub is lower than the first species. The stems are covered with a smooth brown bark; the branches are slender, pliable, extend wide on every side, and frequently bend down where they are not supported; flowers in large panicles at the end of the former year's shoots, of a pale blue colour, and having a very agreeable odour; they appear at the end of May, soon after those of the common sort, but do not perfect their seeds in England. There are two varieties, one with almost white flowers, the other with flowers of a bright purple colour. This shrub was formerly known among the nurserymen by the name of *Persian Jasmin.*—It is usually propagated by suckers, which the roots send out in great plenty. They should be carefully taken off from the old plant in autumn, and planted in a nursery, in the same manner as directed for the first; where they may grow two years to get strength, and then be transplanted whither they are designed to remain. A better way of raising them is, by laying down the young branches, which will be sufficiently rooted in one year to transplant, and may then be treated in the same way as the suckers.

4. Syringa Suspensa. Leaves ovate, serrate, and ternate; stem flexuose, ascending, and then hanging down; branches opposite, remote, divaricated, resembling the stem; flowers from opposite buds, solitary, two or three, yellow, on a wrinkled peduncle. It begins to flower in April, and is often cultivated for the elegance of its flowers.—Native of Japan.

The Common Lilac.

The Persian Jasmine, or Lilac.

The Agem, or Persian Lilac.

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Tabernæmontana; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, permanent; segments acute, converging, very small. *Corolla:* one-petalled, funnel-form; tube cylindric, long; border five-parted, flat; segments obtuse, oblique; nectary glands five, bifid, standing round the germen. *Stamina:* filamenta five, very small, from the middle of the tube; antheræ erect, arrow-shaped, converging, generally inclosed in the tube. *Pistil:* germina two, simple; style awl-shaped; stigma oblong, headed. *Pericarp:* follicles two, horizontally reflexed, ventricosed, acuminate, one-celled, one-valved. *Seeds:* numerous, ovate-oblong, obtuse, wrinkled, immersed in pulp, imbricate. Essential Character. Contorted. *Antheræ:* arrow-shaped. *Follicles:* two, horizontal. *Seeds:* immersed in pulp.——The species are,

1. Tabernæmontana Citrifolia; *Citron-leaved Tabernæmontana.* Leaves elliptical, pointed; panicles axillary, stalked, cymose, of few flowers, umbelled. This tree rises to the height of fifteen or sixteen feet, covered with a smooth gray bark, abounding with a milky juice, and sending out several branches from the side; flowers white, with a light agreeable scent. The French call it *Bois Laitcux.*—Native of the West Indies, Martinico, and the island of Namoka in the South Seas.——The plants of this genus may be propagated by seeds, which must be procured from their native countries, and should be sown early in the spring on a hot-bed. When the plants come up, and are fit to remove, transplant them carefully into small pots filled with light rich earth, and then plunge them into a hot-bed of tanners' bark, shading them in the heat of the day until they have taken new root. In warm weather admit the free air daily, but if the nights prove cold, the glasses should be covered with mats every evening, soon after the sun goes off from the bed. They must be frequently refreshed with water, but not in large quantities, especially while young, for, being full of a milky juice, they are very subject to rot with much moisture. The plants may remain during the summer season in the hot-bed, provided the tan is stirred up to renew the heat when it wants it, and a little new tan added; but at Michaelmas, when the nights begin to be cold, the plants should be removed, and plunged into the bark-bed in the stove: where during the winter season they must be kept in a moderate degree of warmth, and with very little watering in cold weather: they ought to remain in the stove even in warm weather; but may have free air admitted to them by opening the glasses. They may also be propagated by cuttings taken off from the old plant during the summer, and laid to dry in the stove five or six days before they are planted, that the wounded parts may heal, otherwise they will rot. These cuttings should be planted in pots filled with fresh light earth, and plunged into the hot-bed of tanners' bark, and closely covered with a hand-glass, observing to shade them from the mid-day sun in hot weather, and to refresh them often with a little water. When the cuttings have taken root, they may be transplanted into separate pots, and treated in the same manner as those which are raised from seeds.

2. Tabernæmontana Laurifolia; *Laurel-leaved Tabernæmontana.* Leaves opposite, oval, bluntish. This species rises with a shrubby stalk twelve or fourteen feet high, sending out a few branches towards the top, which grow erect. The flowers are produced in a sort of umbel from the side of the branches; they are small, yellow, and have an agreeable scent.—Native of Jamaica, St. Domingo, and other islands of the West Indies.

3. Tabernæmontana Echinata; *Rough-fruited Tabernæmontana.* Leaves opposite, ovate, oblong, acuminate; flowers glomerate-umbelled; fruits echinate. Stems woody, branched, five or six feet high.—Native of Guiana.

4. Tabernæmontana Heterophylla; *Various-leaved Tabernæmontana.* Leaves elliptic-lanceolate, and subcordate, somewhat waved, acuminate, smooth on both sides; branches dichotomous; flowers racemed.—Native of Cayenne.

5. Tabernæmontana Grandiflora; *Great-flowered Tabernæmontana.* Leaves ovate-lanceolate, acute; stem dichotomous; calices unequal, very loose. This shrub is upright, eight feet high. The flower, which appears from July to September, has something in common with Echites and Cerbera, but the fruit is that of a Tabernæmontana.—Native of Carthagena.

6. Tabernæmontana Cymosa; *Cyme-flowered Tubernæmontana.* Leaves opposite, ovate-lanceolate; flowers cymed. This is an elegant upright shrub, sometimes one, and at others two fathoms high. It flowers in July and August.—Native of woods and coppices about Carthagena.

7. Tabernæmontana Amygdalifolia; *Almond-leaved Tabernæmontana.* Stamina extending beyond the tube of the corolla; flowers white, smelling very sweet. They generally appear before the leaves. It is a shrub about six feet high, upright, branched, and milky.—Found near Carthagena.

8. Tabernæmontana Discolor; *Two-coloured Tabernæmontana.* Leaves opposite, ovate-lanceolate; peduncles axillary, two-flowered; flowers whitish or yellowish, small. This shrub is about a fathom in height.—Native of Jamaica.

9. Tabernæmontana Undulata; *Wave-leaved Tabernæmontana.* Leaves lanceolate-elliptic, acuminate, waved; branches dichotomous; flowers subcymed; follicles smooth.—Native of the island of Trinidad.

10. Tabernæmontana Persicariæfolia. Leaves opposite, lanceolate, acuminate; flowers racemed. This shrub is ten feet high, with an upright stem of an arm's thickness.—Found in the island of Mauritius.

11. Tabernæmontana Neriifolia; *Oleander-leaved Tabernæmontana.* Leaves lanceolate, opposite; flowers subracemed, axillary. Branches dichotomous, thickly warted at the top from the fallen leaves, smooth, round; corolla half an inch in diameter.—Native of Porto Rico.

12. Tabernæmontana Elliptica; *Elliptic-leaved Tabernæmontana.* Herbaceous: leaves subtern, lanceolate; stem herbaceous, round, gradually attenuated, simple, smooth, a foot high, or a little more; flowers subterminating in racemes; corolla blue, small.—Native of Japan.

13. Tabernæmontana Alternifolia; *Alternate-leaved Tabernæmontana.* Leaves alternate; stem arborescent.—This shrub is from one to two fathoms high, and flowers most of the year on the coast of Malabar.

14. Tabernæmontana Amsonia; *Virginian Tabernæmontana.* Leaves alternate, ovate-lanceolate; stems herbaceous, very smooth. This is a perennial, which in the spring sends up two or three herbaceous stalks nearly a foot high. The flowers are produced in small terminating bunches, white, and void of scent. It flowers in May and June.—Native of North America. This and the following will live in the open air here, provided they are planted in a warm situation. They love a light soil, rather moist than otherwise; but if they be planted in dry ground, they should be frequently watered in dry weather. Not perfecting seeds in England, they are produced by offsets.

15. Tabernæmontana Angustifolia; *Narrow-leaved Tabernæmontana.* Leaves linear, scattered; stem hairy, herbaceous. Perennial, flowering in May and June.—Native of North America.

16. Tabernæmontana Odorata; *Sweet Tabernæmontana.*

Leaves lanceolate-elliptic, acuminate, smooth; umbels axillary, subsessile, three or four flowered; branches dichotomous, round, smooth.—Native of Surinam.

17. Tabernæmontana Alba; *White-flowered Tabernæmontana.* Leaves oblong, ovate, acuminate, opposite; flowers corymbed, terminating. They come out in pretty large roundish bunches at the ends of the branches, are white, and emit an agreeable odour.—Found growing at Vera Cruz.

18. Tabernæmontana Bufalina. Leaves lanceolate, opposite; peduncles in pairs, one-flowered, pendulous. This is a shrub five feet high, almost upright, branched.—Native of Cochin-china.

19. Tabernæmontana Bovina. Leaves lanceolate, opposite; peduncles solitary, many-flowered. This shrub is upright, four feet high, with reclining branches.—Native of Cochin-china, where it is esteemed emollient; the milky viscid juice is reputed excellent for assisting in the extraction of darts or thorns.

Tacca; a genus of the class Hexandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, superior, permanent, six-parted; segments oblong, converging. *Corolla:* petals six, inserted into the base of the calicine segments; helmet arched, the lip of the helmet emarginate, two-lobed. *Stamina:* filamenta scarcely any; antheræ six, oblong, fastened within to the arch of the petals, tending downwards at the tip. *Pistil:* germen inferior, roundish; style short, straight, thick; stigma orbicular, stellate; rays six, bluntish, convex above. *Pericarp:* berry dry, subglobular, six-ribbed, hexangular, one-celled, crowned with the calix. *Seeds:* very many, ovate, somewhat angular, striated, fastened all round to the coat of the berry. *Observe.* Are not the petals rather to be denominated filamenta? Solander thought they might. The berry, before it is ripe, is three-celled; but when ripe, the pulp is so dried up, that the cells cannot be distinguished. Essential Character. *Calix:* six-parted. *Corolla:* six-petalled, inserted into the calix, anther-bearing. *Stigma:* stellate. *Berry:* dry, hexangular, many-seeded, inferior.——The only known species is,

1. Tacca Pinnatifida. Root composed of many tubers heaped together here and there, emitting fibres; leaves pinnatifid.—Native of the East Indies, China, Cochin-china, Banda, and the Society Isles. The root is red, the size of a man's fist, and roundish. In its natural state it is one of the most bitter and acrid, but loses something of these qualities by culture. In its raw state it is rasped, and washed frequently in water, when a white meal-like starch falls to the bottom: this is again washed, until no more acrimony can be perceived in the water. The meal is then dried in the sun. The first infusions are carefully thrown away, being looked upon as noxious, and even deadly. In Otaheite, and the other Society islands, they make of this meal a tasteful, nourishing, gelatinous cake, like Salep. In Banda, where Sago-bread is not common, they use this as a succedaneum, and it is even preferable to the other. They also apply it as a plaster to deep wounds. The petioles and stalk, when boiled a long time, lose their acrimony, and are rendered fit for food, as well as the roots, in China and Cochin-china.

Tagetes; a genus of the class Syngenesia, or Polygamia-Superflua.—Generic Character. *Calix:* common quite simple, one-leafed, tubular, oblong, five-cornered, five-toothed. *Corolla:* compound radiate; corollets hermaphrodite, tubular, many, on an elevated disk; females ligular, five in the ray: proper in the hermaphrodites, tubular, half five-cleft, erect, longer than the calix; segments linear, inwardly villose: in the females, ligular, longer than in the hermaphrodites, almost equal in length and breadth, very blunt, narrower towards the tube, tomentose, permanent. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* in the hermaphrodites, germen oblong; style filiform, length of the stamina; stigma bifid, slender, reflexed: in the females, germen oblong; style filiform, length of the hermaphrodite; stigma bifid, slender, reflexed. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites, solitary, linear, compressed, a little shorter than the calix; down with five erect acuminate unequal chaffs: in the females, like the others. *Receptacle:* naked, small, flat. Essential Character. *Calix:* one-leafed, five-toothed, tubular. *Florets* of the ray: five, permanent. *Down:* with firm erect chaffs. *Receptacle:* naked.——The species are,

1. Tagetes Patula; *French Marygold.* Stem spreading; leaves pinnate; leaflets lanceolate, with hair-pointed serratures; stalks single-flowered, somewhat swelling upwards. The stem subdivided, patulous, a foot and half high, almost upright, smooth, diffused; flowers solitary, terminating, gold-coloured, on a long upright peduncle. There are many varieties of this species, differing in size, and still more in colour, some beautifully variegated, and others quite plain. Dillenius describes one with oblong red spots dividing the orange; and Curtis, another which is gold-coloured with red stripes. The latter remarks, that the seed of the common small sort has a strong disagreeable smell, and is of a more humble growth, with more spreading branches and smaller flowers, that have usually a larger proportion of yellow: the larger one, commonly called the Sweet-scented, with the flowers bigger, and having a variety of rich tints, has a less disagreeable smell, though even it cannot be called sweet. From the seeds of both varieties some rise extremely double, and others single. It flowers from the beginning of July till the frost sets in, and is supposed to have been imported from Africa, where it is said to grow spontaneously, into Europe.—This, and the next species, being annuals, must be propagated from seeds every spring. The seeds may be sown upon a moderate hot-bed in the beginning of April. When the plants appear, admit plenty of fresh air, to prevent their being overdrawn, which destroys their beauty. When they are about three inches high, they should be transplanted on a very moderate hot-bed, which may be arched over with hoops, and covered with mats, for these plants are hardy enough to be reared without glasses: in this bed they should be planted about six inches asunder each way, observing to water and shade them until they have taken root; but as they acquire strength, let them be inured to bear the open air by degrees, and about the beginning of May they should be taken up with a ball of earth to the root of each plant, and planted into the borders of the paterre garden, or into pots for furnishing the courts, shading them carefully from the sun till they have taken new root, and also supplying them duly with water. When their flowers appear, if any prove single, the plants should be destroyed; and then those in pots may be removed to the court, where the several varieties, being intermixed with other annual plants, afford an agreeable variety. The varieties, especially of the African Marygold, are very subject to vary; hence, unless the seeds be very carefully saved from the finest flowers, they are apt to degenerate; nor should their seeds be too long sown in the same ground.

2. Tagetes Erecta; *African Marygold.* Stem simple, upright; leaves pinnate, leaflets lanceolate, with hair-pointed serratures; peduncles naked, one-flowered. Of this species there are the following varieties: 1. Pale yellow or brimstone colour. 2. Deep yellow. 3. Orange coloured: all these have single, double, or fistulous flowers. 4. Middling Afri-

can, with orange-coloured flowers. 5. Sweet-scented African. Parkinson remarks, that the flower "is of the very smell of new wax, or of an honeycomb, and not of that poisonfull scent of the smaller kindes."—Native of Mexico. See the preceding species.

3. Tagetes Minuta; *Small-flowered Chili Marygold.* Stem simple, upright; peduncles scaly, many-flowered. This grows taller than either of the former. The peduncles stand erect, close to the stem, and sustain three or four white flowers, which appear very late in autumn. This plant has very little beauty, and is preserved only for the sake of variety. See the fourth species.—Supposed to be a native of South America.

4. Tagetes Rotundifolia. Stem simple, upright; leaves cordate, simple; peduncles naked, one-flowered; flower large and yellow.—Found at Vera Cruz.

5. Tagetes Elongata; *Long-stalked American Marygold.* Stem erect, nearly simple; leaves pinnate; leaflets linear, serrated at the end; stalks single-flowered, elongated, slightly swelling. Roots annual; stem three to six inches high; flower deep yellow.—Native of South America.

6. Tagetes Lucida; *Sweet Chili Marygold.* Leaves simple, finely serrated; panicle corymbose. Root perennial; stem erect, two feet high, round, striated, leafy, smooth, branched in the upper part; leaves about two inches long, opposite, smooth, veiny, full of pellucid dots; panicle level-topped, many-flowered; flowers of a golden yellow, agreeably scented.—Native of New Spain. It is in some degree hardy, and will endure our ordinary winters with a slight degree of protection.

Tallow Tree. See *Croton.*

Tamarindus; a genus of the class Monadelphia, order Triandria, according to *Schreber;*—of the class Triandria, order Monogynia, according to *Linneus.*—Generic Character. *Calix:* perianth one-leafed; tube turbinate, compressed, attenuated below, permanent; mouth oblique; border four-parted, deciduous; segments ovate, acute, flattish, reflexed, coloured; the upper and lower a little wider. *Corolla:* petals three, ovate, concave, acute, crenate, waved, reflexed, length of the calix, inserted into the mouth of the tube; the two lateral ones a little larger. *Stamina:* filamenta three, inserted into the orifice of the calix at the void sinus, length of the corolla, awl-shaped, united below up to the middle, bowed towards the corolla; antheræ ovate, incumbent, large. There are besides seven rudimenta of stamina, five of them setaceous threads alternate with the filamenta, and united below, but separate above, headed, very short; the two lateral ones lower than the others; and two minute bristles springing from the calix below the filamenta, and incumbent on them. *Pistil:* germen oblong, compressed, curved in, placed on a pedicel fastened to the bottom of the calix, and growing longitudinally to its tube under the back beyond the tube, with the upper margin villose; style awl-shaped, ascending, pubescent on the lower margin, a little longer than the stamina; stigma thickened, obtuse. *Pericarp:* legume oblong, compressed, blunt, with a point, swelling at the seeds, covered with a double rind, the outer dry and brittle, the inner membranaceous; a soft pulp between both; one-celled, not opening. *Seeds:* few, angular-roundish, plano-compressed, shining, hard. Essential Character. *Calix:* four-parted. *Petals:* three. *Nectary:* of two short bristles under the filamenta. *Legume:* pulpy within.——The only known species is,

1. Tamarindus Indica; *Tamarind Tree.* Leaves pinnate, composed of sixteen or eighteen pairs of leaflets, without a single one at the end; they are about half an inch long, and the sixth of an inch broad, of a bright green, a little hairy, and sit close to the midrib. The flowers come from the side of the branches, five, six, or more together, in loose bunches. The stem is lofty, and of considerable thickness, covered with a brown bark; and divides into many branches at the top, spreading wide every way. The calix is straw-coloured; and the petals yellowish, beautifully variegated with red veins. The timber of this tree is heavy, firm, and hard: it is sawn into boards, and applied to many useful purposes in building. The use of the fruit was first taught by the Arabians: it contains a larger proportion of acid, with a saccharine matter, than is usually found in the acid dulcet fruits, and is therefore not only employed as a laxative, but also in abating thirst and heat in various inflammatory complaints, and for correcting putrid disorders, especially those of a bilious kind, in which the cathartic, antiseptic, and refringent qualities of this fruit, have been found equally useful. When intended merely as a laxative, it may be of advantage to join with it manna or purgatives of a sweet kind, by which its use is rendered safer and more effectual. Three drachms of the pulp are usually sufficient to open the body; but to render it moderately cathartic, one or two ounces are required. The leaves are sometimes used in subacid infusions, and a decoction of them is said to destroy worms in children. The fruit is frequently made an ingredient in punch in the West Indies; and, mixed with a decoction of Borage, is reputed excellent in allaying the heat of urine.—Native of Egypt, Arabia, and of both Indies.—*Propagation and Culture.* Sow the seeds on a hot-bed in the spring, and, when the plants are come up, plant each in a separate small pot filled with light rich earth, and plunge them into a hot-bed of tanners' bark, to bring them forward, observing to water and shade them until they have taken root; and as the earth in the pots appears dry, they must be watered from time to time, and require air in proportion to the warmth of the season, and of the bed in which they are placed. As soon as the pots become filled with their roots, remove them into pots of a larger size, filled with rich light earth. Plunge these again into the hot-bed, giving them air as before, according to the warmth of the season; but in very hot weather the glasses should be shaded with mats in the heat of the day, otherwise the sun will be too violent for them through the glasses; nor will the plants thrive when exposed to the open air even in the warmest season. Hence they must be confined in the bark-stove both summer and winter, treating them as has been directed for the Coffee-tree, with whose culture they will thrive exceeding well.

Tamarix; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth five-parted; segments obtuse, erect, permanent, shorter by half than the corolla. *Corolla:* petals five, ovate, concave, obtuse, spreading. *Stamina:* filamenta five, capillary; antheræ roundish. *Pistil:* germen acuminate; style none; stigmas three, oblong; revolute, feathered. *Pericarp:* capsule oblong, acuminate, three-sided, longer than the calix, one-celled, three-valved. *Seeds:* numerous, very small, pappose. *Observe.* The fourth species has ten stamina, of which the alternate outer ones are shorter; they are all connate at the base. Essential Character. *Calix:* five-parted. *Petals:* five. *Capsule:* one-celled, three-valved. *Seeds:* with a feathery crown.——The species are,

1. Tamarix Gallica; *French Tamarish.* Flowers five-stamined; spikes lateral; leaves lanceolate, embracing, imbricate. This is a very elegant shrub, very much branched, and shading the banks of rivers. There are several reputed varieties, which Willdenow thinks will prove distinct species. The Russians and Tartars use a decoction of the twigs in the gout and rheumatism, and contusions of the limbs, as a

fomentation; they also drink it for internal injuries; and make handles for whips, &c. of the wood. This is easily distinguished from the fourth species, by the fineness of its leaves, and the flowers having only five stamina.—The common sort is found in great abundance near Sinigaglia in Italy, all along the hedges near the sea, where the sheep are said to prefer it to every other food. It has been gathered in a wild state on St. Michael's Mount, Cornwall; near Hurst Castle in Hampshire, and Hastings in Sussex.—*Propagation.* The plants of this genus may easily be increased, either by laying down their tender shoots in autumn, or by planting cuttings in an eastern border, which will take root in a short time, if they are supplied with water in the spring, before they begin to shoot, in dry weather; but they should not be removed until the following autumn, when they may be either placed in a nursery to be trained up two or three years, or else where they are designed to remain, observing to mulch their roots, and water them according as the season may require, until they have taken root; after which, the only culture they will require is to prune off the straggling shoots, and keep the ground clean about them. The increasing by layers is not only unnecessary trouble, since cuttings grow very readily, but it is also a bad method, because they often will not strike at all. The cuttings should be of the last summer's shoot, and a moist border is most proper for them. In two years they will be good plants for the shrubbery, and may be planted out in almost any soil, though they thrive best (especially the German sort) in a moist soil.

2. Tamarix Articulata; *Jointed Tamarisk.* Flowers five-stamined; spikes lateral; leaves very short, sheathed.—Native of the East Indies and Arabia.

3. Tamarix Songarica; *Songarian Tamarisk.* Flowers eight or ten stamined, axillary, subspiked; leaves fleshy, obtuse, three-sided.—Found in Siberia.

4. Tamarix Germanica; *German Tamarisk.* Flowers ten-stamined; spikes terminating; leaves sessile, linear-lanceolate. This species is particularly used abroad in obstructions of the lower viscera, and especially in diseases of the spleen. By combustion it yields no inconsiderable quantity of a fixed salt, which is diuretic and aperient, and almost approaches to Glauber's salt. The bark of the root is the most efficacious part of the plant. A decoction of this bark is given in doses of two to six drachms, or even of an ounce: double that quantity of the wood and leaves are prescribed. The variety described by Pallas, near the Caspian Sea, is remarkable for having its stem herbaceous.—Native of Germany, by the banks of the Rhine and Danube; found also in Norway, Dauphiny, and Spain. Common in English gardens, flowering from June to September.

Tamus; a genus of the class Diœcia, order Hexandria.—Generic Character. *Male. Calix:* perianth six-parted; leaflets ovate-lanceolate, spreading more at top. *Corolla:* none. *Stamina:* filamenta six, simple, shorter than the calix; antheræ erect. *Female. Calix:* perianth one-leafed, six-parted, bell-shaped, spreading; segments lanceolate, superior, deciduous. *Corolla:* petals none; nectary an oblong point, fastened internally to each calicine segment at the base. *Pistil:* germen ovate-oblong, large, smooth, inferior; style cylindrical, length of the calix; stigmas three, reflexed, emarginate, acute. *Pericarp:* berry ovate, three-celled. *Seeds:* two in each cell, globular. Essential Character. *Male. Calix:* six-parted. *Corolla:* none. *Female. Style:* trifid. *Berry:* three-celled, inferior. *Seed:* two in each cell.——The species are,

1. Tamus Communis; *Common Black Briony.* Leaves cordate, undivided. Root perennial, very large, tuberose, blackish externally; stems herbaceous, branched, smoothish, twining about every thing in their way, and thus ascending without the aid of tendrils to the height of ten or twelve feet in hedges or among bushes, which their festoons of tawny leaves and red berries decorate in autumn. The male flowers soon fall off; but the female are succeeded by ovate smooth berries; these are insipid. The root of this plant is acrid, and its pulp scraped has been used as a stimulating plaster. It is one of the best remedies known against the gravel, and all other obstructions and disorders of the urinary passages; and is a powerful diuretic, and very efficacious in removing female obstructions. The best method of giving it for the above purposes, is to bruise the root, and give the expressed juice, with the addition of a little white wine. The juice made into a syrup with honey, is an admirable remedy for asthmatic complaints, and other disorders of the breast and lungs. The bruised root applied to the parts affected in paralytic cases, has been found serviceable in many instances. The young shoots are said to be good eating, when dressed like Asparagus. The Moors eat them boiled, with oil and salt.—Native of Europe, but not of the northern parts: it is found in shady thickets, hedges, and woods: also in the Levant, and about Algiers.—Sow the seeds soon after they are ripe, under shelter of bushes, where, in spring, the plants will come up, and require no further care. The roots will abide many years.

2. Tamus Elephantipes; *Tuberous Cape Black Briony.* Leaves kidney-shaped, undivided; root elevated, corky, and tessalated. The root is a foot in diameter, rising out of the ground, and is covered with brown knobs; it sends out in the spring a slender, twining, annual stem, about eight feet long: the flowers are yellowish-green.—Native of the Cape.

3. Tamus Cretica; *Cretan Black Briony.* Leaves three-lobed. The root of this is rounder than that of the preceding species, but the principal difference is between their leaves.—It was found by Tournefort in Candia. It is an abiding plant, hardy enough to live in the full ground in England, and may be increased like the first species.

Tanacetum; a genus of the class Syngenesia, order Polygamia-Superflua.—Generic Character. *Calix:* common hemispherical, imbricate; scales acute, compact. *Corolla:* compound tubular, convex; corollets hermaphrodite, numerous, tubular, in the disk; females, some, in the ray: proper of the hermaphrodite, funnel-form, with a five-cleft reflexed border; female trifid, more deeply divided inwardly. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* in the hermaphrodites, germen oblong, small; style filiform, length of the stamina; stigma bifid, revolute: in the females, germen oblong; style simple; stigmas two, reflexed. *Pericarp:* none; calix unchanged. *Seeds:* solitary, oblong, crowned with more or less of a slight margin. *Receptacle:* convex, naked. *Observe.* Sometimes there are no radical corollets, but all are hermaphrodite. Seed in some naked. Essential Character. *Calix:* imbricate, hemispherical. *Corolla:* rays obsolete, trifid, sometimes wanting. *Seed:* crowned with a border. *Receptacle:* naked.——The species are,

1. Tanacetum Suffruticosum; *Shrubby Tansy.* Leaves pinnate, multifid; segments linear, subdivided, acute; stem suffruticose. The flowers are produced in small roundish bunches at the ends of the branches: they are of a bright yellow colour, and appear in August.—Native of the Cape of Good Hope. This, and all the species from the Cape, must be kept in pots, and removed into shelter before hard frosts come on. They are easily increased by cuttings planted in a bed of loamy earth during any of the summer months.

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Shade them until they have taken root, and frequently refresh them with water. When they have good roots, take them up with balls of earth, and plant them in pots, placing them among other hardy exotic plants, where they may remain till late in October. They only require shelter from hard frost; and need fresh air in mild weather.

2. Tanacetum Sibiricum; *Siberian Tansy.* Leaves pinnate; segments linear, filiform; corymbs smooth; stem herbaceous; flowers bright yellow.—Native of Siberia.

3. Tanacetum Incanum; *Hoary Tansy.* Leaves bipinnate, tomentose; corymb ovate, compound; flowers yellow, turned upwards.—Native of the Levant.

4. Tanacetum Cotuloides; *Chamomile-like Tansy.* Leaves tooth-pinnate, acuminate; stem very much branched; flowers subpanicled. This is an annual plant, which has the appearance of Chamomile.—Native of the Cape.

5. Tanacetum Annuum; *Annual Tansy.* Leaves bipinnatifid, linear, acute; corymbs tomentose. Stem stiff but herbaceous, two or three feet high, sending out many side-branches their whole length; the branches are terminated by clusters of bright yellow flowers. The whole plant has a fine aromatic scent.—Native of Spain and Italy. It is propagated by seeds, and will thrive in the open air.

6. Tanacetum Monanthos; *One-flowered Tansy.* Stem quite simple, one-flowered, length of the leaves; corolla yellow. Annual.—Native of the Levant.

7. Tanacetum Vulgare; *Common Tansy*, or *Ale-cost.* Leaves bipinnatifid, gash-serrate, naked. Root fibrous, creeping to a great distance; stems upright, two or three feet high, and sometimes four feet in a garden. The whole herb is bitter and aromatic: the flowers are in terminating corymbs, of a golden colour, and flattish. According to Bergius this plant is tonic, stomachic, anthelminthic, emmenagogue, and resolvent; qualities usually attributed to bitters of the warm or aromatic kind. Dr. Clark informs us, that in Scotland it was found to be of great service in various cases of gout; and Dr. Cullen says, I have known several who have taken it without any advantage, and some others who reported that they had been relieved from the frequency of the fits. A strong infusion of the fresh leaves removes obstructions, increases the urinary discharge, and gently promotes the menstrual one. The flowers dried, powdered, and mixed with treacle, are a common medicine among country people for the worms, and they visibly destroy them. It may be given in powder to the quantity of a drachm or more, for a dose, but it has been more commonly taken in infusion, or drunk as tea. The tender leaves are sometimes used to give a colour and flavour to puddings; and the Finlanders employ it in dying green. If meat be rubbed with this plant, the flesh-fly will not attack it. Cows and sheep are reputed to eat, and horses, goats, and hogs, to refuse it. There are three varieties: one with a curled leaf, which is called Double Tansy by gardeners; another with variegated leaves; and a third with larger leaves, which have little scent.—It is easily propagated by the creeping roots, which, if permitted to remain undisturbed, will in a short time overspread the ground. The slips therefore should be placed at least a foot asunder, and in beds where the paths round them may be often dug, to keep their roots within bounds. They may be transplanted either in spring or in autumn, and will thrive in almost any soil or situation. If this plant be wanted early in spring, make a gentle hot-bed in December, and plant the old roots thereon, without dividing them; covering the bed with hoops and mats in cold weather. The second species is thus treated.

8. Tanacetum Balsamita; *Costmary.* Leaves ovate, entire, serrate. Roots hardy, fleshy, creeping; the stems rise two or three feet high; the flowers are produced at the top of the stems, in a loose corymb, they are naked, of a deep yellow colour, appearing in August, but are not succeeded by seeds in England. The whole of this plant emits a soft pleasant odour, and is pleasanter and more aromatic than Common Tansy. Like the preceding species it was formerly put into ale, and hence both have been called *Ale-cost.* A strong infusion of the leaves is good in disorders of the stomach and head; and has been much celebrated for its efficacy in removing obstructions of the menses, and the several complaints to which the sex are liable in consequence thereof.—It is easily propagated by parting the roots in autumn. Where it is planted for use, the slips should be set in beds, at two feet distance every way: in two years the roots will meet; every other year, therefore, they should be parted and transplanted to keep them within compass. They will thrive in almost any soil or situation, but abide longest in dry land.

9. Tanacetum Flabelliforme; *Fan-leaved Tansy.* Corymbs simple; leaves deltoid, serrate at the tip.—It flowers from May to August, at the Cape.

Tanæcium; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, truncate, quite entire. *Corolla:* one-petalled, long; tube cylindrical, widened above; border from erect spreading, five-cleft, almost equal; the two upper segments approximating, less divided, nearly upright, the three lower spreading a little, reflexed. *Stamina:* filamenta four, almost equal, shorter than the corolla, bending in under the back of the tube, with the rudiment of a fifth; antheræ two-lobed. *Pistil:* germen placed on a fleshy ring, roundish; style simple; stigma two-lobed. *Pericarp:* berry large, subpedicelled, globular or oblong, two-celled. *Seeds:* numerous, oblong, angular, nestling. Essential Character. *Calix:* cylindrical, truncate. *Corolla:* tubular, almost equal, five-cleft; rudiment of a fifth filamentum. *Berry:* corticose, two-celled, many-seeded.——The species are,

1. Tanæcium Jaroba. Lower leaves ternate, upper geminate; tendrils interpetiolary, terminating; stem scandent. This rises with great ease to the top of the tallest trees in the woods, and then spreads a great way over the limbs of the neighbouring trees, or bends again towards the ground; flowers white, short-lived; berry very large, a foot long, oval, pendulous, smooth, brittle when ripe. The Portuguese call this plant *Casca amargosa*, on account of its bitterness. —Native of Jamaica.

2. Tanæcium Parasiticum. Leaves ovate, coriaceous; stem scandent, shrubby, rooting. This weakly plant generally sustains itself by the help of the neighbouring trees, or is found spreading upon the ground, where it does not meet with a support.—It is found in various parts of Jamaica.

Tanners' Bark, is the bark of the Oak reduced into coarse powder, to be used in tanning, or dressing of skins, after which it is of great use in gardening: first, by its fermentation, when laid in a proper quantity, the heat being always moderate, and of long duration, which renders it very serviceable for hot-beds; and secondly, after it is well rotted it becomes excellent manure for all sorts of cold stiff land, upon which one load of tan is better than two of rotten dung, and will continue longer in the ground. The use of this article for hot-beds is not of long standing in England. The first was used at Blackheath above a century ago, for the raising of Orange-trees. Since that time the use of hot-beds has been more general: they are now common in all gardens containing collections of tender exotics. The following are Mr. Miller's directions concerning this bark, as it is connected with the management of hot-beds. The tanners in some

parts of England do not grind the bark to reduce it into small pieces, as is commonly practised by the tanners near London, where there is a great difference in the size of the bark, some being ground much smaller than the other, according to the different purposes for which it is intended; but in many places the bark is only chopped into large pieces, which renders it very different for the use of hot-beds; for if the tan be very coarse, it will require a longer time to ferment than the small tan; but when it begins to heat, will acquire a much greater degree, and will retain the heat a much longer time than the small; therefore, when there is choice, the middling-sized tan should be preferred, for it is very difficult to manage a hot-bed made of the largest tan; the heat of which is often so great as to injure the roots of plants that are fully plunged into the beds. Therefore, where the persons who have the care of these beds do not diligently observe their working, they may in a short time destroy the plants: on the other hand, if the tan be very small, it will not retain the heat above a month or six weeks, and will be rotten, and unfit for a hot-bed, in a short time. The tan should always be such as has been newly taken out of the pits, for if it lies long in the tanner's yard before it is used, the beds seldom acquire a proper degree of heat, nor do they continue their heat long; so that when it has been more than a fortnight or three weeks out of the pit, it is not so good for use as that which is new. If the tan be very wet, it will be proper to spread it abroad for two or three days, to drain out the moisture, especially if it be in the autumn or winter season, because then, as there will be little sun to draw a warmth into the tan, the moisture will prevent the fermentation, and the beds will remain cold; but in summer there is no great danger from the moisture of the tan. The heat of the sun through the glasses will then be so great as soon to cause a fermentation in the tan. The tan-beds should be always made in pits, having brick-walls round them, and a brick pavement at the bottom, to prevent the earth from mixing with the tan, which will prevent the tan from heating. These pits must not be less than three feet deep, and six feet in width, but seven is better: the length must be in proportion to the number of plants they are to contain, but if less than ten feet in length, they will not retain their heat long; for where there is not a good body of tan, the outside of the bed will soon lose its heat, and the plants there plunged will have no benefit of the warmth, nor will the middle of these beds retain their heat so long; hence they will not answer the purpose for which they were intended. When the tan is put into the bed, it must not be beaten or trodden down too close, for that will cause it to adhere, and form one solid lump, so that it will not acquire a proper heat; nor should it be trodden down at the time when the pots are plunged into the beds, to avoid which there should be a board laid across the bed, and supported at each end, to prevent its resting upon the tan, and upon this board the person who plunges the pots into the tan should stand. When the tan is quite fresh, and has not been out of the pits long enough to acquire a heat, the beds will require a forthight, or sometimes three weeks, before they will be of a proper temperature of warmth to receive the plants; but in order to ascertain this, there should be three or four sticks thrust down into the tan, about eighteen inches deep, in different parts of the bed, that by drawing out the sticks, and feeling them at different depths, it will be easy to judge of the temper of the bed; and it will also be proper to let a few of these sticks remain in after the plants have been plunged, in order to ascertain the warmth of the bed. When the tan is good, one of these beds will retain a proper degree of heat for nearly three months, and when the heat declines, if the tan be forked up and turned over, and some new tan added to it, the heat will renew again, and will continue two months longer; so that by turning over the contents of the pit, and adding some new tan every time the heat declines, the bed may be continued for a year: but it will still be proper, every autumn, to take out a large quantity of the old tan, and to add as much new in its place, that the heat of the bed may be kept up in winter: for the plants would suffer greatly if it were suffered to decline during the cold season. Before any tan is added in winter, it should be laid in a dry place a week or ten days, to dry; otherwise its moisture might chill the old tan-bed, and prevent the fermentation: hence, unless the tan be turned over again, there will be little or no heat in the beds, which frequently proves fatal to the plants. Whoever therefore has the management of these beds, should constantly and carefully observe the warmth of the tan, because upon keeping the beds in a proper temperature, their whole success depends. Where this caution is not observed, it frequently happens that the Ananas run into fruit very small, or with other plants are infested by insects, both which are caused by the growth of the plants being stopped by the decline of the heat of the tan; therefore great regard must be had to that, especially in winter. The great advantages which these tan-beds have over those composed of horse-dung, are the moderate degree of heat which they acquire; for their heat is never so violent as that of horse-dung, and they continue this heat much longer; and when the heat declines, it may be renewed by turning the beds over, and mixing some new tan with the old, which cannot be so well done with horse-dung; and likewise the beds will not produce so great steams, which often injure tender plants.—Tan, we have already observed, is an excellent manure for all cold stiff lands, after it can be of no further service in the bark-bed. If it be laid upon grass ground in autumn, that the rains in winter may wash it into the ground, it will greatly improve the grass; but when used fresh, or in the spring of the year, just before dry weather, it is liable to cause the grass to burn.—Those who live near plenty of Oaks, and probably at a great distance from any tan-pits, will be pleased to learn, that Oak-leaves are even preferable to the bark; for they always heat regularly and constantly, never heating with violence, or turning cold after the furious heat is gone off: there is also a saving in expense, for the decayed fermented leaves make good garden manure, whereas rotten tan is wholly unfit for any horticultural purpose. Having found plenty of the Oak-leaves, take them into heaps, carry them to some place near the hot-house, fence them with hurdles, or whatever will keep them from being blown about, tread them well, and water them if they be brought in dry. Make the heap six or seven feet thick, and cover it with mats. In a few days the heap will come to a strong heat, and in five or six weeks they will be properly prepared for the hot-house. In getting them into the Pine-pits, if they appear dry, water them again, and tread them well, till the pits are quite full. Then cover the whole with tan two inches thick, and tread it till the surface becomes smooth and even. On this place the Pine pots, beginning with the middle row first, and filling up the spaces between the pots with tan, as when tan only is used. The leaves will retain a constant and regular heat for twelve months, without stirring or turning. After this, the Pines will have no occasion to be moved, except when their pots are to be shifted, &c. when a little fresh tan should be added. Without a covering of tan, the leaves, by their caking, will be liable to shrink from the sides of the pots, and let the heat escape.

Tanner's Sumach. See *Rhus Coriaria*

Tansy. See *Tanacetum.*

Tansy, Wild. See *Potentilla.*

Tapioca. See *Jatropha Manihot.*

Tap Root. That sort of root which shoots directly downward to a great depth. In the vegetable kinds of tap-rooted plants, they all require a deeply broken-down and prepared soil, in order to grow them with any success, and to any considerable sizes. And in the tree sorts, they must always rise from the seeds where they are sown, as they cannot be transplanted out with any propriety or advantage. Where the land is not properly prepared to a suitable depth, they are usually short, forked, and of awkward growth; and when raised by transplanting, very small and stinted: but some of them cannot be at all grown in the last method.

Tarchonanthus; a genus of the class Syngenesia, order Polygamia-Æqualis.—Generic Character. *Calix:* common turbinate, one-leafed, commonly half seven-cleft, coloured internally, shorter than the corolla, sharpish, permanent. *Corolla:* compound uniform; florets about twenty; corollets hermaphrodite, numerous, equal; proper one-petalled, funnel-form, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindric, tubular, length of the corollet, tailed at the base. *Pistil:* germen inferior, oblong; style twice as long as the flower; stigmas two, gaping. *Pericarp:* none; the calix unchanged. *Seeds:* solitary, oblong. *Down:* hairy, investing the seed all round. *Receptacle:* hairy, very small; hairs length of the calix. *Observe.* The down is singular in this, that it does not crown, but invest the seed. Essential Character. *Calix:* one-leafed, commonly half seven-cleft, turbinate. *Seeds:* covered with down. *Receptacle:* villose. The plants of this genus are too tender to live through the winter in the open air of England, but requiring no artificial heat, may be placed with Myrtles, Oleanders, &c. in winter; and may be exposed in summer to the open air in a sheltered situation. They may be increased by cuttings, planted in May, in pots filled with light earth; and if plunged into a moderate hot-bed, it will promote their putting out roots. Screen them from the sun until they have taken root, about the middle of July, and then transplant each into a separate pot, which must be placed in the shade to take root, after which they may stand with other hardy exotic plants in a sheltered situation, to the middle or end of October, when they should be removed into the green-house, placing them where they may have a large share of air in mild weather. Being very thirsty plants, they must be very often watered. They require shifting into larger pots once a year.——The species are,

1. Tarchonanthus Camphoratus; *Shrubby African Fleabane.* Leaves oblong, flat, densely downy beneath; stem strong, woody, rising to the height of twelve or fourteen feet, sending out many woody branches at the top, which may be trained to a regular head. The flowers are produced in spikes at the extremity of the shoots, and being of a dull purple colour, do not make any great appearance.—Native of the Cape.

2. Tarchonanthus Glaber; *Smooth African Fleabane.* Leaves smooth, entire, toothed. This very much resembles the preceding species, but is void of smell, and entirely smooth all over. It varies with wider and narrower, entire and toothed leaves.—Native of the Cape.

3. Tarchonanthus Ericoides; *Heath-like African Fleabane.* Leaves oblong, smooth, imbricated in furrows; calices four-leaved. This is a stiff branching shrub, seldom attenuated at the top: corollas few, minute, concealed within the snow-white down of the receptacle, which is much larger than the flower.—Native of the Cape.

Tare. See *Ervum* and *Vicia.*

Targionia; a genus of the class Cryptogamia, order Hepaticæ.—Generic Character. *Calix:* perianth a continued membrane, finely reticulated, enveloping the pistil, at length bursting. *Stamina:* antheræ numerous, roundish, sessile, scattered over the inside of the perianth. *Pistil:* germen oval, nearly sessile, accompanied at the base by the rudimenta of others, with abortive styles; style terminal, awl-shaped, tubular, deciduous; stigma concave. *Pericarp:* capsule sessile, nearly globose, of two hemispherical valves, bursting vertically, and one cell. *Seeds:* very numerous, minute, roundish, connected by five threads into a dense globular mass. Essential Character. *Capsule:* globose, of two concave valves, and one cell. *Seeds:* numerous, combined by fibres into a globe.——The only known species is,

1. Targionia Hypophylla; *Dotted Targionia.* Fronds oblong, inversely heart-shaped, three-quarters of an inch in length, growing nearly horizontally, in dense imbricated patches, attached by copious fine fibrous roots; their upper surface dark-green, marked with a slight longitudinal furrow, and besprinkled with pale prominent points; the under side black, becoming visible when, by drought, the margins are curled in.—Very common in heathy and rather moist places, among Mosses, on old walls and rocks in Italy. It is said also to have been found in Devonshire, and in Scotland.

Taxus; a genus of the class Diœcia, order Monadelphia.—Generic Character. *Male. Calix:* none, except a bud like a four-leaved perianth. *Corolla:* none. *Stamina:* filamenta numerous, united at bottom into a column, longer than the bud; antheræ depressed, blunt at the edge, eight-cleft, gaping every way at the base, and when they have discharged their pollen, flat, peltate, and remarkable for their eight-cleft margin. *Female. Calix:* inferior, one-leafed, close, undivided, entire. *Corolla:* none. *Pistil:* germen ovate-acuminate; style none; stigma obtuse. *Pericarp:* berry from the receptacle elongated into a preputium, globular, succulent, gaping at the top, coloured, at length wasting from dryness, and evanescent. *Seed:* one, ovate-oblong, prominent at the top, beyond the berry. *Observe.* The berry, strictly speaking, ought not to be called a pericarp. It is remarkable; nor does a similar berry occur, except in in *Gualtheria.* Essential Character. *Male. Calix:* none. *Corolla:* none. *Stamina:* many. *Antheræ:* peltate, eight-cleft. *Female. Calix:* cup-shaped, entire. *Corolla:* none. *Style:* none. *Seed:* one, in an entire berried calix.——The species are,

1. Taxus Baccata; *Common Yew Tree.* Leaves linear, approximating, nearly flat. Trunk straight, with a smooth deciduous bark; wood very hard, tough, and of a fine grain: flowers axillary, enveloped with imbricate bractes; the male on one tree, sulphur-coloured, without a calix; the female on another, with a small green calix, assuming the appearance of a scarlet berry, sustaining the oval, flattish seed: it in some degree resembles a small acorn whilst it is young; but as it advances, the scarlet cup becomes more fleshy, and is elongated till it covers the whole seed or nut, except a round hole at the tip. The comparative value of a Yew with other trees, in former times, may be seen from the following table, taken from the ancient laws of Wales.

A consecrated Yew, its value is a pound;
An Oak, its value is sixscore pence;
A misletoe branch, its value is threescore pence;
Thirty pence is the value of every principal branch in the Oak;
Threescore pence is the value of a sweet Apple-tree;
Thirty pence is the value of a sour Apple-tree;
Fifteen pence is the value of a wood Yew-tree;
Seven-pence half-penny is the value of a Thorn-tree;
Four pence is the value of every tree after that.

The great value here set upon the consecrated Yew, says Withering, induces me, among other reasons, to think that it was commonly planted in church-yards, rather from motives of superstition, than on account of its utility in making bows, as many have supposed; for a single tree would have afforded a very scanty supply for this purpose. Our forefathers were particularly careful in preserving this funeral tree, the branches of which it was usual to carry in solemn procession to the grave, and afterwards to deposit them under the bodies of their departed friends. The learned Ray says, that our ancestors planted the Yew in church-yards, because it, being an evergreen, afforded a symbol of that immortality which they hoped and expected for the persons there deposited. For the same reason, this and other evergreen trees are still carried in funerals, and thrown into the grave with the corpse in some parts of England; and are in Wales planted with flowers upon the grave itself. Mr. Gilpin, contrary to general opinion, is a great admirer of the form and foliage of this tree. The Yew, he insists, is of all other trees the most tonsile; hence all the indignities it suffers; we every where see it cut and metamorphosed into such a variety of deformities, that we are hardly brought to conceive it has a natural shape, or the power which other trees have of hanging carelessly or negligently: yet it has this power in a very eminent degree; and in a state of nature, except in exposed situations, is perhaps one of the most beautiful evergreens we have. It has been much debated whether the Yew-tree be poisonous or not. Mr. White, in his History of Selborne, has given the following authentic information on the subject. In the church-yard of this village, he says, is a Yew-tree, the aspect of which bespeaks it to be of great age: the body is squat, short, and thick, and measures twenty-three feet in the girth, supporting a head of extent suitable to its bulk. This is a male tree, which, in the spring, sheds clouds of dust; and fills the atmosphere around with its farina. As far as we have been able to observe, the male trees become much larger than the females; and most of the Yew-trees in the church-yards of this neighbourhood are males: but this must have been matter of mere accident, since men, when they first planted Yews, little dreamed of the sexes of trees. In a yard in the midst of the street, till a few years since, grew a middle-sized female tree, which commonly bore great crops of berries. By the high winds usually prevailing about the autumnal equinox, these berries, when ripe, were blown down into the road, where the hogs ate them. It was remarkable, that though barrow-hogs and young sows found no inconvenience from this food, yet milch sows often died after such a repast; a circumstance that can be accounted for, only by supposing that the latter, being much exhausted and hungry, devoured a larger quantity. The twigs and leaves of Yew, eaten in a very small quantity, are certain death to horses and cows, and that in a few minutes. A horse, tied to a Yew-tree, or a faggot-stack of dead Yew, shall be found dead before the owner can be aware that any danger is at hand. Mr. White has been several times a sorrowful witness to losses of this kind among his friends; and, in the Isle of Ely, had once the mortification to see nine young steers or bullocks of his own, all lying dead in a heap, from browzing a little on a hedge of Yew, in an old garden into which they had broken in snowy weather. Even the clippings of a Yew hedge have destroyed a whole dairy of cows, when thrown inadvertently into a yard. And yet sheep and turkeys, and, as park-keepers say, deer, will crop these trees with impunity. Some intelligent persons assert, that the green branches are innoxious; but among the number of cattle which have fallen victims to this deadly food, not one has been found, but had, when it was opened, a lump of green Yew in its paunch. It is true, that Yew-trees stand for twenty years or more in a field, and no bad consequences ensue; but at some time or other, either from wantonness when full, or from hunger when empty, cattle will be meddling, to their certain destruction. The leaves of this tree are certainly fatal to the human species. Evelyn relates a case of two women who died from drinking an infusion of them. Dr. Percival, of Manchester, mentions another, of three children, who were killed by a spoonful of green leaves, which was given them for the worms, though they had taken the same quantity of dried leaves the day before, without any effect; and they died without agony, or any of the usual symptoms of vegetable poisons. A clergyman in Sussex, two of whose parishioners, a lady and her servant, unhappily took a decoction of Yew, instead of Rue, for the ague, gives the following account. They sent to the church-yard, where a large old tree grew, and gathered a quantity of the leaves, of which they made a decoction, and drank it before going to bed. The next morning they were both found dead: this was Sunday, on the Thursday following he was called upon to bury them, and performed his office on the servant, but the young lady had so fine a bloom on her countenance, that hopes were entertained of her being in a state of suspended animation, and accordingly tried the experiments usual in such cases, but without success. They determined, however, not to bury her at that time, but to keep her till the ensuing Saturday, and even then the corpse remained unchanged. What made it most remarkable, was, that this fatal accident happened in November, in that damp murky kind of weather, which renders it necessary to hasten the interment of those who have died natural deaths. In various parts of the united kingdom there are famous trees of this kind, which our limits will not permit us to particularize.—It is a native of Europe generally, especially of Great Britain, and of North America and Japan. Its proper situation is in mountainous woods, or more particularly in the clefts of high calcareous rocks. This tree was formerly, as the oak is now, the basis of our strength. Of it the old English Yeoman made his long bow, which he vaunted nobody but an Englishman could bend. In shooting, he did not, as in other nations, keep his left hand steady, and draw the bow with his right; but keeping his right at rest upon the nerve, he pressed the whole weight of his body into the horns of his bow. Hence arose the English phrase of *bending a bow;* and the French, of *drawing* one. So great was the demand for Yew in the days of archery, that our own stock could not supply the bowyers, and they were obliged by statute to import staves of it for making bows, sometimes at an exorbitant expense.—The wood of the Yew is red and veined, very hard and smooth, much used by turners, inlayers, and cabinet-makers. For cogs of mills, handles of tools, posts to be set in moist ground, and everlasting axle-trees, it is incomparable. It is also used for the bodies of flutes, bowls, wheels, pins for pulleys, spoons, cups, and flood-gates for fish-ponds, which hardly ever decay. Mr. Boutcher asserts, upon his own experience, that the wooden parts of a bed, made of Yew, will not be approached by bugs. The only use of this tree in gardens, is to form hedges for the defence of exotic plants; for which purpose, when it is necessary to have hedges, it is the most proper of any; the leaves being small, and the branches so close together, that if carefully shorn, they break the winds better than any other sort of fence, because they are not reverberated as against walls and pales. The only disadvantage is, that they are a harbour for snails and other vermin. In plantations, this tree may be so placed as to become an

ornament among other evergreens; and where a disagreeable object is to be concealed, no tree is more effectual; and it may be removed even after it has grown to a considerable size.—*Propagation and Culture.* Sow the berries in autumn as soon as they are ripe, without clearing them from the pulp, upon a shady bed of fresh undunged soil, covering them about half an inch thick with the same earth. In the spring, clear the bed carefully from weeds, and, if the season prove dry, refresh the bed with water occasionally, to promote the growth of the seeds, many of which will come up the same spring, but others will remain in the ground till the autumn or spring following; but where the seeds are preserved above ground until spring before they are sown, the plants never come up until the year after. In this bed, constantly well cleared from weeds, the plants may remain two years, when they should be removed in autumn into a spot of fresh undunged soil, divided into beds four or five feet wide. Set them in rows a foot asunder, and six inches from each other, observing to lay a little mulch upon the surface of the ground about their roots, as also to water them in dry weather until they have taken root; after which they will require no further care, but to keep them clear from weeds in summer, and to trim them according to the purpose for which they are designed. In these beds they may remain two or three years, according as they have grown, when they should be removed in autumn into the nursery; placing them in rows at three feet distance, and the plants eighteen inches asunder in the rows, and trimming them in the summer according to the design for which they are intended. In three or four years more, they may be transplanted where they are to remain, observing always to remove them in autumn where the ground is very dry, but on cold moist land it is better in the spring. Mr. Boutcher advises that the seeds should be divested of their pulp before they are sown. In this case, some will appear in the following spring; but as these will be much the smaller part, he recommends mixing the seeds with the earth till spring. The Yew may likewise be propagated by cuttings of one or two years' growth, planted in a shady border at the beginning of April or the end of August: torn branches are preferable for this purpose. In two years they will be fit for removal to another nursery, where they may remain three years, and so on, according to the size required. It is a very slow-growing tree, but none may be more safely transplanted when old; so that you may at once form with it hedges seven or eight feet high. Never clip them in autumn.

2. Taxus Nucifera; *Acorn-bearing Yew.* Leaves linear, distant. A lofty tree, with many opposite scaly branches. The fruit of this species resembles the acorns of the Oak, and is astringent: it is eaten in deserts, and is said to be very wholesome, and even laxative to the bowels, notwithstanding its astringent taste. An oil expressed from it is used in cookery; and the wood is in request among the cabinet-makers.—Native of the northern parts of Japan.

3. Taxus Macrophylla; *Long-leaved Yew.* Leaves solitary, lanceolate, remote; branches round, knotted from the fallen leaves, flexuose, erect, ash-coloured, smooth; flowers among the leaves, axillary, dicecous. The wood is used by the cabinet-makers. It flowers in June.—Native of Japan near Nagasaki.

4. Taxus Verticillata: *Whorl-leaved Yew.* Leaves whorled, linear, sickle-shaped; branches round, smooth, ash-coloured. A tree with dense branches, gradually shorter upwards, like a Cypress, three fathoms high.—Native of Japan.

Tea Buckthorn. See *Rhamnus.*

Tea Tree. See *Thea.*

Tea, New Jersey. See *Ceanothus.*

Tea, New Zealand. See *Philadelphus.*

Tea, Oswego. See *Monarda.*

Tea, West Indian. See *Sida.*

Teak Tree. See *Tectona.*

Teasel. See *Dipsacus.*

Tectona; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, half five-cleft, permanent; segments ovate, from upright spreading, obtuse. *Corolla:* one-petalled, funnel-form, length of the calix; tube short; border five-cleft; segments spreading, ovate, externally tomentose. *Stamina:* filamenta five, inserted into the orifice of the tube of the corolla, very short; antheræ globular, grooved, standing out. *Pistil:* germen superior, ovate, very villose, girt with a short pitcher-shaped gland; style filiform, erect, a little longer than the calix; stigma obtuse, two or three toothed; according to Thunberg, two, revolute, obtuse. *Pericarp:* drupe subglobular, depressed, five-lobed, rounded, four-cornered, hirsute, corky-spongy, juiceless, concealed in the enlarged, inflated, membranous calix. *Seed:* nut subglobular, terminated by a round tubercle, four-ribbed, four-celled; axils bony, hollow within; kernels compressed. *Observe.* The terminal flowers are often six-cleft; hence the genus is referred to the class Hexandria by Thunberg. Essential Character. *Corolla:* five-cleft. *Stigma:* toothed. *Drupe:* dry, spongy, within the inflated calix. *Nut:* four-celled.—The only known species is,

1. Tectona Grandis; *Teak Tree,* or *Indian Oak.* Leaves opposite, spreading, ovate, a little scolloped, above scabrous, beneath covered with soft white down; flowers small, white, very numerous, fragrant; trunk erect, growing to an immense size; bark ash-coloured; branches cross-armed, numerous, spreading; young shoots four-sided; sides channelled; nut exceedingly hard, four-celled. The wood of this tree has by long experience been found to be the most useful timber in Asia. It is light, easily worked, and, though porous, at the same time both strong and durable. That which grows near the banks of the Godavery is beautifully veined, and much closer grained. Pegu produces the largest quantity; the large rivers there enable the natives to bring it down to the sea-ports from the interior mountainous parts of the country where it grows, at a cheap rate, which enables them to sell it lower than in any other part of India. The trade between Calcutta, Madras, and Rangoon, is principally for Teak timber, without which a durable vessel cannot be built in Bengal. For ship-building, it is manifestly superior to every other sort of wood, being light, strong, and very durable, either in or out of water. During the last thirty years it has been gradually rising into general esteem for naval architecture, and very recently the finest men-of-war, and Indiamen of the largest class, have been built entirely of this excellent timber-tree, and sent to England as specimens; where the best judges have pronounced both the materials and the workmanship, especially the former, to be equal, if not superior, to any thing which has yet been seen on the river Thames. For men-of-war it is particularly desirable, being wholly free from that fatal liability to splinter, by which English Oak has long been more destructive to our brave naval defenders, than the common balls of their antagonists.—Native of the vast forests in Java and Ceylon, Malabar, Coromandel, Pegu, Ava, the coast of Cochin-china, and of Cambodia. On the coast of Coromandel it flowers in the hot season, and the seed is ripe in August and September.

Telephium; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth five-leaved; leaflets oblong, obtuse, concave, keeled, length of the corolla.

permanent. *Corolla:* petals five, oblong, obtuse, narrower below, erect, inserted into the receptacle. *Stamina:* filamenta five, awl-shaped, shorter than the corolla; antheræ incumbent. *Pistil:* germen three-sided, acute; style none; stigmas three, acute, spreading. *Pericarp:* capsule short, three-sided, three-valved, one-celled; receptacle free, shorter by half than the capsule. *Seeds:* very many, roundish. ESSENTIAL CHARACTER. *Calix:* five-leaved. *Petals:* five, inserted into the receptacle. *Capsule:* one-celled, three-valved.——The species are,

1. Telephium Imperati; *True Orpine.* Leaves alternate. A hardy perennial, flowering in summer. Root composed of yellowish woody fibres spreading out wide; stalks and branches slender, trailing, eight or nine inches long; flowers terminating in short thick bunches; petals white or pale flesh-coloured.—Native of the south of France, Spain, Switzerland, Italy, and Barbary. Sow the seeds in autumn, on a bed of fresh light earth, in an open situation; for if they be sown in the spring, they will not come up till the spring again returns. Leave them six or eight inches asunder, and clear them well from weeds, which would soon overbear such trailing plants. They do not transplant well, and therefore should be sown where they are to remain. The seeds will soon scatter, and, if undisturbed, come up in abundance.

2. Telephium Oppositifolium. Leaves opposite. This is distinguished by its larger conjugate leaves.—Native of Barbary.

Teramnus; a genus of the class Diadelphia, order Decandria.—GENERIC CHARACTER. *Calix:* perianth one-leafed, two-lipped; upper lip a little larger, bifid; lower three-toothed; teeth acute, erect, approximating. *Corolla:* papilionaceous; standard obcordate, spreading, erect, bent down a little; wings length of the standard, erect, approximating, rounded at the tip; keel very small, concealed at the base by the calix between the lower part of the wings, bipartite, covering the stamina. *Stamina:* filamenta ten, five very small and barren, alternate with the others, which are fertile, longer, and united at the base; antheræ five, roundish. *Pistil:* germen elongated, pubescent; style none; stigma round, headed. *Pericarp:* legume linear, compressed, margined. *Seeds:* many, roundish, compressed, retuse at the end. ESSENTIAL CHARACTER. *Keel:* very small, concealed within the calix. *Stamina:* alternate, five barren. *Stigma:* sessile, headed. *Calix:* two-lipped.——The species are,

1. Teramnus Volubilis. Leaves ovate-lanceolate, pubescent. The flowers are small, reddish-blue, and disposed in slender spikes at the axils of the leaves. The seed-vessels are long, slender, and compressed.—This creeping or climbing plant is common in the lower hills of Jamaica, and runs generally the length of six or seven feet from the root.

2. Teramnus Uncinatus. Leaves oblong, obtuse, silky beneath. Stem herbaceous, subdivided, twining, slender, and triangular; flowers in distant pairs, small, reddish.—Native of Jamaica.

Terminalia; a genus of the class Polygamia, order Monœcia.—GENERIC CHARACTER. *Hermaphrodite Flowers,* at the lower part of the raceme, flowering first. *Calix:* perianth one-leafed, superior, five-cleft, coloured within; segment ovate, acute, equal. *Corolla:* none; nectary pitcher-shaped, in the bottom of the calix, consisting of five small hispid corpuscles. *Stamina:* filamenta ten, awl-shaped, from erect spreading, longer than the calix, and inserted into the bottom of it; antheræ roundish, erect. *Pistil:* germen inferior, ovate-oblong; style filiform, erect, length of the stamina; stigma simple. *Pericarp:* drupe oval, depressed, two-grooved, or compressed, acuminate. *Seed:* nut oval-oblong, two-valved; kernel oblong. *Males,* superior flowering later; calix as in the hermaphrodites. *Corolla:* none; nectary as in the hermaphrodites. ESSENTIAL CHARACTER. *Calix:* five-parted. *Corolla:* none. *Stamina:* ten. *Nectary:* five-cleft, hairy. *Drupe:* inferior, boat-shaped.——The species are,

1. Terminalia Catappa. Leaves obovate, tomentose beneath. This is a large tall leafy tree, with spreading branches in whorls. At Banda and Batavia it appears in the desert, and is much liked by Europeans. It is commonly planted near the houses, in wide areas; and seats are placed under it, for the enjoyment of the close extensive shade which it affords. The timber is fit for ship-building, being light, and lasting many years in salt water. The bark and leaves yield a black pigment, with which the Indians dye their teeth, and Indian ink is made.—Native of the East Indies; said to bear fruit three times annually.

2. Terminalia Glabrata. Leaves obovate, smooth on both sides. This is a lofty widely-branching tree, with a straight stem, clear of branches to a great height: the branches are mostly opposite, round, spreading, smoothish, with a cinereous cloven bark. It differs from the preceding in having the leaves only half the size, and without any pubescence on the lower surface; the nut only one-third of the size, not at all grooved or margined, but as it were appendicled with an acute, compressed, membranaceous apex.—Native of the Society and Friendly Islands in the South Seas. In the former it is cultivated near their huts, and in their burying-places. The wood is used in building boats and making drums, benches, &c. The kernels are often eaten, and have the flavour of almonds.

3. Terminalia Latifolia. Leaves obovate, subserrate; drupes fleshy. This tree has a very large trunk, and grows to a vast height, covered with a gray or very light brown bark, seeming to be loose, and coming off in long pieces: it has here and there some knobs and eminences on its surface.—Native of the inland woods of Jamaica.

4. Terminalia Arbuscula. Leaves ovate-lanceolate, entire, pubescent; branches dichotomous; racemes erect.—Native of Jamaica.

5. Terminalia Chebula. Leaves ovate, naked; petioles biglandular above; racemes simple. This tree scarcely exceeds three or four times the height of a man, and is not much diffused. All the flowers are hermaphrodite, but those which are fertile may be easily distinguished from the barren ones, by having the germen thickened at the base.—Native of the East Indies.

6. Terminalia Angustifolia. Leaves lanceolate, pubescent; bark smooth, or very minutely cloven, brown. The bark on the wood of the Officinal Benzoin, which Thunberg brought over, resembles that of this tree very much, but that is now ascertained to be a species of Storax.—Native of the East Indies.

7. Terminalia Bellerica. Leaves ovate, wavy, smooth; footstalks about half as long as the leaves, with two glands at the top; spikes axillary, solitary, hardly longer than the footstalks. A large tree, with a very widely spreading head: wood white, soft, and not durable. The bark, when wounded, exudes a copious insipid gum, like gum-arabic, soluble in water.—Native of hills in the East Indies.

Ternstræmia; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-parted, upon which two smaller scales are incumbent; all the segments are orbicular, concave, and permanent. *Corolla:* one-petalled, bell-shaped; tube none; border five-parted; segments orbicular, concave, emarginate, longer than the calix. *Stamina:* filamenta numerous, awl-shaped, inserted

in a double row into the base of the corolla, and shorter than it; antheræ linear, erect, length of the filamenta. *Pistil:* germen superior, roundish; style cylindric, length of the stamina; stigma capitate. *Pericarp:* berry juiceless, ovate, even, two-celled. *Seeds:* about eight, convex on one side, flat on the other. ESSENTIAL CHARACTER. *Calix:* five-parted. *Corolla:* one-petalled, wheel-shaped, with the border bell-shaped, five or six parted. *Antheræ:* thick at the tip. *Berry:* juiceless, two-celled.——The species are,

1. Ternstrœmia Meridionalis. Leaves obovate, emarginate, quite entire; peduncles axillary. This is a tree, with determinate branches, and more simple stiffish branchlets, with an ash-coloured bark.—Found in New Granada.

2. Ternstrœmia Elliptica. Leaves elliptic, quite entire; peduncles lateral. A shrub. The branches have a smooth wrinkled bark.—Native of the West India Islands.

3. Ternstrœmia Punctata. Leaves oblong, quite entire, subemarginate, dotted at the edge; peduncles axillary. This is a tree about twenty-five feet high.—Native of Guiana, in the woods of Serpent Mountain.

4. Ternstrœmia Japonica. Leaves ovate-lanceolate, serrulate at the tip; peduncles lateral. Stem arboreous, branched, smooth all over.—Native of Japan.

5. Ternstrœmia Dentata. Leaves oblong, acuminate, tooth-serrate; peduncles axillary and lateral. Stem straight, about twenty feet high; flowers yellowish, appearing in August and September.—Native of the woods of Guiana.

Tetracera; a genus of the class Polyandria, order Tetragynia; or, according to Scrœber, of the class Icosandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five or six parted, spreading, permanent; segments roundish, a little unequal. *Corolla:* petals three to five, roundish, concave, inserted into the calix. *Stamina:* filamenta numerous, capillary, widening at the top, permanent, inserted into the calix; antheræ twin, with the cells disjoined. *Pistil:* germina three or four, sometimes solitary, ovate, oblique, diverging; styles simple, permanent; stigmas obtuse. *Pericarp:* capsules as many as there are germina, ovate, divaricating, opening by the inner side. *Seeds:* solitary or few, surrounded by a rayed aril. ESSENTIAL CHARACTER. *Calix:* five or six leaved. *Corolla:* four or five petalled. *Filamentum:* widening above, and antheræ-bearing on each side. *Capsules:* one to four, opening on the side. *Seed:* arilled at the base.—The seeds of the plants of this genus being procured from the countries where they naturally grow, should be sown in pots filled with light earth, and plunged into a moderate hot-bed of tanners' bark, where they must be treated in the same way as other tender exotic seeds from the same countries.——The species are,

* *Flowers one-styled.*

1. Tetracera Sarmentosa. Leaves oblong, serrate, rugged; flowers one-styled.—Native of the East Indies.

2. Tetracera Tomentosa. Leaves ovate, acuminate, toothed, smooth above, tomentose beneath; flowers one-styled.—Native of Cayenne, flowering in January.

3. Tetracera Aspera. Leaves roundish, subrepand, rugged; flowers one-styled.—This grows so plentifully in the woods of Guiana, as sometimes to be extremely inconvenient to those who endeavour to walk in them, from the entanglement of its stems and branches, which climb to the top of trees, and hang from thence to the ground. The French call it *Liane rouge*, or red climber, from the colour of its decoction, which is considered as a remedy for venereal disorders.

4. Tetracera Doliocarpus. Leaves oblong, acuminate, toothed at the end; peduncles axillary, one-flowered; flowers one-styled.—Native of Surinam.

5. Tetracera Stricta. Leaves ovate-lanceolate, toothed; flowers terminating, one-styled; stem strict.—Native of Surinam.

6. Tetracera Nitida. Leaves lanceolate-oblong, rugged, quite entire; flowers one-styled; branches round, smooth.—Said to have been found in Trinidad.

** *Flowers mostly four-styled.*

7. Tetracera Euryandra. Leaves oblong, obtuse, even, quite entire; flowers three-styled. Stem shrubby, climbing.—Native of New Caledonia.

8. Tetracera Volubilis. Leaves very rugged, serrate; flowers four-styled. This has a woody stalk rising to the height of twelve or fourteen feet, covered with a gray bark, and sending out several slender woody branches, which twine about any neighbouring support.—Native of South America.

9. Tetracera Lævis. Leaves oblong, even, almost quite entire, acuminate; flowers terminating; capsules four. Stem shrubby; branches flexuose, with an ash-coloured bark, smooth, somewhat angular.—Native of the East Indies.

10. Tetracera Alnifolia. Leaves oblong, acute, almost entire, somewhat rugged beneath; panicle terminating. Branches woody, round, smooth.—Native of Guiana.

Tetragonia; a genus of the class Icosandria, order Pentagynia.—GENERIC CHARACTER. *Calix:* perianth four-leaved, superior; leaflets four, ovate, bent down, and flat, rolled back at the edge, coloured, permanent. *Corolla:* none, unless the calix be called so. *Stamina:* filamenta twenty, capillary, shorter than the calix; antheræ oblong, incumbent. *Pistil:* germen roundish, four-cornered, inferior; styles four, awl-shaped, recurved, length of the stamina; stigmas longitudinal of the styles, pubescent. *Pericarp:* drupe coriaceous, four-cornered, with four longitudinal wings, the opposite angles narrower, not opening. *Seed:* one, bony, four-celled; kernels oblong. *Observe.* The first flower adds a fifth part of the number in every part of the fructification: hence, according to the general rule, it is placed in the order *Pentagynia.* ESSENTIAL CHARACTER. *Calix:* three to five parted. *Petals:* none. *Drupe:* inferior, enclosing a nut from three to eight celled.——The species are,

1. Tetragonia Fruticosa; *Shrubby Tetragonia.* Shrubby: leaves linear; fruits winged. Stems slender, woody, rising three or four feet high if supported, otherwise trailing, covered with a light gray bark, and dividing into a great number of trailing branches, which when young are succulent, of an herbaceous colour, and covered with small pellucid drops, which reflect the light somewhat like the Diamond Ficoides.—It is a native of the Cape. This, and the five next following species, may be propagated by cuttings, which should be cut off from the plants a few days before they are planted, that the part where they are cut may be healed, otherwise they will rot, for the leaves and stalks are very full of moisture. The best time to plant them is in July, that they may have time to make good roots before winter. They may be planted on a bed of fresh earth, and should be shaded from the sun in the heat of the day: they ought to be frequently refreshed with water, but must not have it in too great plenty, for that will rot them. In about six weeks after planting, the cuttings will be sufficiently rooted to transplant; therefore they should be taken up, and planted into pots filled with light fresh undunged earth, and placed in a shady situation till they have taken new root; after which time they may be placed with other hardy exotic plants in a sheltered situation, where they may remain till the middle or latter end of October, and should then be removed into the green-house, and placed where they may enjoy as much free

air as possible in mild weather; for they only require to be protected from the frost, being tolerably hardy; but ought not to be much watered in winter. If planted during summer in the full ground, they will grow prodigiously rank and large; as they also will if permitted to root into the ground through the holes at the bottom of the pots, which should be frequently moved to prevent it. Their flowers have no great beauty, but, as their whole appearance is singular, they may be allowed a place in collections of plants, especially as they need little attention. It may also be raised from seeds. See the next species.

2. Tetragonia Decumbens; *Trailing Tetragonia.* Shrubby, frosty: leaves obovate; fruits winged. This has larger stalks than the preceding species, but they branch out in the same manner, with the branches trailing upon the ground: the flowers also are larger, and appear from July to September.—Native of the Cape. This, and the first species, may be propagated by seeds, sown on a gentle hot-bed or warm border of light fresh earth, where sometimes they will remain a whole year before the plants come up. When they are about four inches high, take them up, and plant them in pots; treating them in the same manner as has been directed for the cuttings.

3. Tetragonia Herbacea; *Herbaceous Tetragonia.* Herbaceous, even: leaves ovate, petioled; fruits winged. This has large fleshy roots: it is smooth, and succulent, with many decumbent, branched, annual leafy stems, and scattered, ovate, more or less acute, entire leaves; flowers yellow. —Native of the Cape. This species never produces seeds in England, but will grow from cuttings planted early in the spring, with the same facility as the others.

4. Tetragonia Hirsuta; *Hairy Tetragonia.* Herbaceous, hirsute, procumbent: leaves ovate, villose; flowers axillary, tern, sessile.—Native of the Cape.

5. Tetragonia Spicata; *Spiked Tetragonia.* Smooth, herbaceous, erect: lower leaves ovate, uppermost lanceolate, smooth; flowers racemed.—Native of the Cape.

6. Tetragonia Echinata; *Hedge-hog Tetragonia.* Herbaceous: leaves rhomb-obovate; fruits echinate. Root biennial; stem herbaceous, dividing into diffused branches, rendered angular by the petioles running down them, scarcely a foot long. It flowers from May till August: the flowers are pendulous, purple-stalked, appearing as if frosted, clothed with crystalline bladders.—Native of the Cape.

7. Tetragonia Expansa; *Horned Tetragonia.* Herbaceous: leaves ovate-rhombed: fruits four-horned. Root fibrous; stem divided from the bottom into many irregular, round, leafy branches. The whole plant is studded with very minute crystalline dots; flowers yellow. Biennial.—Native of New Zealand, by the sides of woods, in bushy sandy places; also within the tropics, on the shore of the island Tongataboo, and in Japan: though not used by the inhabitants, it is a very good pot-herb. Captain Cook ordered it to be served up boiled for his sailors every day at breakfast and dinner, while they remained in port.—This is very tender, and must be kept in a stove: it can only be propagated by the seeds.

8. Tetragonia Crystallina; *Diamond Tetragonia.* Herbaceous, frosty: leaves ovate, sessile; fruits unarmed. Root annual; plant a span high, the whole covered with crystalline papillæ; stem nearly erect, branched from the bottom; leaves about two inches long, bright green; flowers of a dull orange or tawny yellow, axillary.—Found in Peru. It will only live here in a stove.

Tetranthus; a genus of the class Syngenesia, order Polygamia-Segregata.—Generic Character. *Calix:* common five-leaved, four-flowered; leaflets linear, erect, ciliate at the base of the florets; perianth proper one-leafed, tubulous, attenuated at the base, compressed, oblique at the throat, ciliate at the edge, one-flowered, many times longer than the common calix. *Corolla:* compound uniform, equal; corollets four, hermaphrodite: proper one-petalled, funnel-form; tube gradually widening; border five-cleft, unequal; the two upper segments smaller, and less divided, the three lower more spreading, oblong, obtuse. *Stamina:* filamenta five from the base of the corollet, half the length of the tube; antheræ tubulous. *Pistil:* germen from the bottom of the perianth, under the filamenta, oblong; style longer than the stamina and corolla, filiform, divided beyond the middle; stigmas reflexed, linear, obtuse. *Pericarp:* none; perianth proper unchanged, permanent, including. *Seed:* oblong, striated, crowned with the membranaceous ciliate margin of the apex. *Receptacle:* very small, naked. Essential Character. *Calix:* common four-flowered; perianth proper, one-leafed. *Seed:* one, crowned.——The only species is,

1. Tetranthus Littoralis. A small annual herb, flowering in the spring; flowers small, white.—Native of Hispaniola.

Tetraphis; a genus of the class Cryptogamia, order Musci. Essential Character. *Capsule:* oblong. *Fringe:* simple, of four pyramidal, erect, unconnected teeth.——The species are,

1. Tetraphis Pellucida; *Transparent Four-toothed Moss.* Capsule cylindrical; leaves ovate, acute, single-ribbed. Root fibrous, matted; stems mostly simple.—Found in moist shady places, about the roots of trees, in various parts of Europe.

2. Tetraphis Ovata; *Ovate Four-toothed Moss.* Capsule ovate; radical leaves ligulate, obtuse, without a rib.—Found near Edinburgh, and on sand-stone rocks, near Ripon in Yorkshire

Teucrium; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, half five-cleft, acute, almost equal, gibbous at the base on one side, permanent. *Corolla:* one-petalled, ringent; tube cylindric, short, ending in an incurvated throat; upper lip erect, acute, deeply two-parted beyond the base, the segments at the sides distant; lower lip spreading, trifid, the lateral segments of the same form with the upper lip, almost erect, the middle one very large, and somewhat rounded. *Stamina:* filamenta four, awl-shaped, longer than the upper lip of the corolla, and ascending in the cleft of it, prominent; antheræ small. *Pistil:* germen four-lobed; style filiform, situation and size of the stamina; stigmas two, slender. *Pericarp:* none; calix unchanged, fostering the seeds at the bottom. *Seeds:* four, roundish. Essential Character. *Corolla:* upper lip two-parted beyond the base, divaricating. *Stamina:* prominent.——The species are,

1. Teucrium Campanulatum; *Small-flowered Germander.* Leaves multifid; flowers lateral, solitary. This very much resembles the third species, but the plant is smooth; root perennial. It flowers in July and August.—Native of the Levant and of Apulia, in moist ground. Sow the seeds in the spring, where the plants are intended to remain; when they come up, thin them where they are too close, and keep them clean from weeds. They ripen their seeds in the first year; but in a warm situation will live through the winter.

2. Teucrium Orientale; *Great-flowered Germander.* Leaves multifid; flowers racemed, of a light purplish-blue colour. It varies with a bright red colour.—Native of the Levant.

3. Teucrium Botrys; *Cut-leaved Annual Germander.* Leaves multifid; flowers lateral, in threes, peduncled. Root annual; stems four-cornered, hairy, about a foot long. This species has a pleasant aromatic odour. In character and qualities, it

is a medium between the fourth and thirty-second species; being less acrid than the former, and more aromatic and bitter than the latter: it may therefore be successfully used in fevers, rheumatism, gout, and other maladies which depend upon the weakness of the stomach and the tenacity of the humours.—Native of Germany, Switzerland, France, and Italy, in dry fields. This is propagated in the same way as the first species; but if the seeds be sown in autumn, or permitted to scatter when ripe, they will succeed better than if sown in the spring, and the plants will come earlier to flower.

4. Teucrium Chamæpitys; *Ground Pine.* Leaves trifid, linear, quite entire; flowers sessile, lateral, solitary; stem diffused. Root small, branched, annual. The whole herb hairy, viscid, aromatic, and bitter; stem much branched, four-cornered, leafy, often red. The whole plant has a highly aromatic odour; and it is an ingredient in the Portland Powder. The young tops, dried and reduced to powder, are much recommended in gouty and rheumatic complaints. It likewise operates powerfully by urine, removes obstructions, and is serviceable in the dropsy, jaundice, and ague; and many accounts are to be met with in creditable authors, of great cures having been performed by its use. It is, however, at present very much neglected, nor indeed do its medicinal virtues appear ever to have been properly ascertained.—Native of many parts of Europe, the Levant, Barbary, and Virginia. In England it abounds in Kent and Surry, but is otherwise a scarce plant. It is found near Purfleet in Essex; about Rochester and Dartford, and at Roehill; also on the leys about the borders of Triplow-heath in Cambridgeshire. —If the seeds be permitted to scatter, the plants will come up better than if sown, and require no care but to thin them, and keep them free from weeds.

5. Teucrium Nissolianum; *Trifid-leaved Germander.* Leaves trifid and quinquefid, filiform; flowers peduncled, solitary, opposite; stem decumbent. Native of Spain and Portugal.—Part the roots in autumn, or sow the seeds at that season. It loves an open situation exposed to the sun, but will thrive in any but a moist soil.

6. Teucrium Pseudo-Chamæpitys; *Bastard Ground Pine.* Leaves three-parted, trifid, linear; flowers racemed; stem rough-haired.—Native of Spain, Portugal, the south of France about Marseilles, and Algiers in Barbary.

7. Teucrium Iva; *Musky Germander.* Leaves three-cusped, linear; flowers sessile, lateral, solitary. Annual, with a single woody root sending out a few fibres; corolla large, rose-coloured, often abortive. The whole plant smells of musk. It has the same qualities with the fourth species, but possesses a more volatile principle, and deserves a place among the sudorifics.—Native of the south of Europe, and of Barbary, in various parts of the kingdom of Tunis.

8. Teucrium Mauritanum; *Moorish Germander.* Leaves pinnate-multifid; stem quite simple, erect; bractes subulate-palmate.—Native of Barbary.

9. Teucrium Fruticans; *Narrow-leaved Tree Germander.* Leaves quite entire, elliptic, tomentose beneath; flowers lateral, solitary, peduncled. Stalk shrubby, branching, rising six or eight feet high, and covered with a hoary bark; corollas pale blue. Mr. Miller mentions a variety with variegated leaves.—Native of Spain, Sicily, and Corsica, near the sea-coast; also of Barbary. This, and the next species may be increased by cuttings planted in the spring on a bed of fresh light earth; shading and watering them until they have taken root, and keeping them clear from weeds until the following autumn; when they may be transplanted into pots, taking them up with balls of earth about their roots, and watering them until they have taken new root. During the winter they may be kept in the green-house with hardy exotics.

10. Teucrium Latifolium; *Broad-leaved Tree Germander.* Leaves quite entire, rhombed, acute, villose, tomentose beneath. This shrubby plant grows seven or eight feet high. —Native of Spain. See the preceding species.

11. Teucrium Resupinatum; *Resupine-flowered Germander.* Villose: leaves lanceolate, deeply serrate; flowers solitary, sessile; corollas resupine. Roots annual, long, twisted, putting forth capillary branchlets; stem erect, hirsute.—Native of Barbary near Mascar, in clayey fields.

12. Teucrium Ramosissimum; *Branched Germander.* Hoary: stem fruticulose, very much branched; branchlets filiform; leaves obovate, crenate; flowers solitary, axillary. The whole plant exhales a very sweet odour.—Native of Barbary, near Cassa, in the clefts of rocks; also of Spain.

13. Teucrium Creticum; *Cretan Germander.* Leaves lanceolate, linear, quite entire; flowers racemed, tern, light purple or pink.—Native of Candia and of Egypt.

14. Teucrium Marum; *Common Marum,* or *Cat-Thyme.* Leaves quite entire, ovate, acute, petioled, tomentose beneath; flowers racemed, all directed one way. This has a low shrubby stalk, sending out many slender woody branches, in warm countries rising three or four feet high, but in England rarely half that height. Flowers crimson. It is of a warm aromatic nature, and good in most nervous disorders. The bark of the old root is considerably astringent, and is of great efficacy in overflowings of the menses, and other hæmorrhages. The leaves dried and reduced to powder, may be taken either alone, or mixed with other ingredients of a like nature, as snuff; and they are, when so used, good in all disorders of the head. The leaves, and younger branches, when fresh, on being rubbed between the fingers, emit a volatile aromatic smell, which readily excites sneezing, but to the taste they are bitterish, accompanied with a sensation of heat and acrimony. Judging from the sensible qualities of this plant, it may be supposed to possess very active powers, and upon this account it is strongly recommended by Wedelius, as an important remedy in many diseases requiring medicines of a stimulant, aromatic, and deobstruent quality; and his opinion seems in some measure to have been since confirmed by actual experience. The dose of the powdered leaves, in wine, is from a scruple to half a drachm. At the beginning of this century many of these plants were growing in the royal gardens at Kensington; they were nearly three feet high, and clipped into conical forms.—Native of Spain. It is easily propagated by slips or cuttings, planted during the summer months on a bed of light loamy earth, covering them down close either with bell or hand glasses, and shading them from the sun. When they have made good roots, transplant them into separate small pots, or on a warm border, at about six inches' distance every way, shading them from the sun, and watering them until they have taken new root; after which they will only require to be kept free from weeds. These plants will live through the winter in the open air, on a dry soil and a warm situation, when the frosts are not very severe; but in hard winters they are frequently killed if not protected by mats or other covering.

15. Teucrium Multiflorum; *Many-flowered Germander.* Leaves ovate, smooth above, serrate-toothed; flowers racemed; whorls six-flowered.—Native of Spain.

16. Teucrium Laxmanni. Leaves ovate, oblong, quite entire, sessile; flowers solitary, sessile; stem half a foot high, villose.—Native of Hungary and Sclavonia.

17. Teucrium Sibiricum; *Siberian Germander.* Leaves

serrate, ovate; peduncles solitary, three-flowered, the middle flower sessile; bractes linear-lanceolate. Perennial.—Native of Siberia.

18. Teucrium Salicifolium; *Willow-leaved Germander.* Leaves lanceolate-elliptic, bluntish, quite entire; calices quadrifid, solitary; stems diffused, roundish, pubescent, perennial at the base.—Native of the Levant.

19. Teucrium Asiaticum; *Asiatic Germander.* Leaves lanceolate, repand, serrate, rectangular at the base; flowers solitary. Stem erect, straight, a foot high, four-cornered, brownish, brachiate, naked, with shorter branches; corolla white, or scarcely flesh-coloured. It flowers from June to October.—Native place unknown.

20. Teucrium Cubense; *Cuba Germander.* Leaves wedge-shaped, serrate-gashed, smooth, attenuated into the petiole; flowers solitary, peduncled. Stem four-cornered, erect, a foot and half high, smooth, little branched, annual, or perhaps biennial; seeds black.—Native of Cuba, in moist hedges and meadows, flowering in December and the following months. To propagate this, and the twenty-fourth species, sow their seeds in small pots in autumn, and plunge them into the tan-bed in the stove between the other pots; in the spring, plunge them into a hot-bed, which will bring up the plants. When these are fit to remove, plant each in a separate pot, and treat them in the same way as directed for tender plants from the West Indies.

21. Teucrium Arduini. Leaves ovate, serrate; raceme spiked, round, sessile, terminating. The whole plant is obscurely pubescent.—Native of Crete, &c.

22. Teucrium Canadense; *Nettle-leaved Germander.* Leaves ovate-lanceolate, serrate: stem erect; raceme round, terminating; whorls six-leaved. This is a perennial plant, very like our Scorodonia, or Wood Sage, but does not creep at the root as that does. The stalks are erect, the under side of the leaves white, and the flowers yellow, in terminating racemes. It flowers in August and September.—Native of North America. Sow the seeds of this, and of the next species, on a bed of light earth. They may also be increased by parting the roots, and will bear the open air.

23. Teucrium Virginicum; *Virginian Germander.* Leaves ovate, unequally serrate; racemes terminating. The stalk is annual, rises nearly a foot high, and is terminated by a long spike of red flowers, which appear in July and August.—Native of Virginia. See the preceding species.

24. Teucrium Inflatum; *Thick-spiked Germander.* Leaves oblong, acuminate, unequally serrate, pubescent; spikes sessile, terminating; calices inflated, villose. It flowers from August till October.—It is a native of Jamaica. See the twentieth species.

25. Teucrium Hircanicum; *Betony-leaved Germander.* Leaves cordate, oblong, obtuse; stem brachiate, dichotomous; spikes very long, terminating, sessile, spiral. It flowers from August to October.—Native of Persia.

26. Teucrium Abutiloides; *Mulberry-leaved Germander.* Leaves cordate, toothed, acuminate; racemes lateral, nodding.—Native of Madeira, flowering in April and May.

27. Teucrium Scorodonia; *Sage-leaved Germander*, or *Wood Sage.* Leaves cordate, serrate, petioled, hairy; racemes lateral, directed one way; stem erect. Root perennial, creeping; herb a foot or two in height, dark green, hairy; corolla pale yellow; stamens purple. Mr. Laurents, in his observations on the husbandry of Flanders, remarks, that in smell and taste this species resembles Hops. It is called *Ambroise* in Jersey; and in that island, when cider fails, they malt their barley at home, and, instead of Hops, use to very good purpose the Ambroise of their hedges. Rutty says, that when this herb is boiled in wort, the beer sooner becomes clear than when Hops are made use of; but Dr. Withering relates, upon trial, that it gave too much colour to the liquor. —Native of Europe and Morocco, in woody and hilly situations, among bushes, and under hedges, where the soil is dry and stony; frequent in such places in most parts of Great Britain, flowering from July to September. Propagated by seeds, or by parting the roots; and will grow in any soil and situation, but is seldom admitted into gardens.

28. Teucrium Pseudo-Scorodonia; *Bastard Wood Sage.* Shrubby: leaves cordate, toothed, petioled, hoary beneath; racemes directed one way. This has the appearance of the preceding, but differs in having a shrubby and more hairy stem, with the lower leaves tomentose beneath, and hoary. —Native of Barbary and Algiers.

29. Teucrium Massiliense; *Sweet-scented Germander.* Leaves ovate, wrinkled, gash-crenate, hoary; stems erect; racemes straight, directed one way; flowers opposite, peduncled; corolla purple, with the lower lip very concave. It has the odour of Nepeta or Catmint.—Native of the south of France, Candia, and Cochin-china. This may be propagated by seeds or cuttings in the same manner as the ninth species, but it requires a dry soil and a warm situation, otherwise they will not live through the winter in the open air of our climate. A plant or two of this and other doubtful species should be housed in winter for security.

30. Teucrium Betonicum; *Hoary Germander.* Leaves lanceolate, crenate, tomentose, hoary beneath; racemes terminating; flowering-stem brachiate. This is a handsome undershrub, about three feet high; flowers crimson. This species, with Heterophyllum and Abutiloides, are intermediate between Teucrium and Ajuga. Perhaps on account of the tube of the corolla being very much lengthened out, and the upper lip scarcely emarginate and not cloven, they would more properly range with the Ajugas, unless we were to sink that genus in Teucrium.—Native of Madeira. It may be increased both by seeds and cuttings, but requires the protection of a green-house in winter.

31. Teucrium Scordium; *Water Germander.* Leaves oblong, sessile, tooth-serrate; flowers axillary, in pairs, peduncled; stem diffused. Root perennial, creeping; corolla pale purple or pink. The whole plant is bitter, and slightly aromatic, and may be used with advantage in weak relaxed constitutions. It is useful in female obstructions, intermitting fevers, scrofulous complaints, the gout, and rheumatism, for all which purposes a strong infusion appears to be the most eligible preparation. A decoction is a good fomentation in gangrenous cases. It has a strong disagreeable scent, somewhat approaching to Garlic. It was once in high esteem as an antiseptic and alexipharmic, to which it certainly had no claim. Bergius states it to be anteputredinous, tonic, diaphoretic, and resolvent. Others recommend it to be employed externally in antiseptic cataplasms, and fomentations. Cullen says it has a bitter joined with some volatile parts. Sheep and goats are reputed to eat this plant; horses, cows, and hogs, to reject it: when cows eat it through hunger, it gives the flavour of Garlic to their milk.—Grows in marshy places, in various parts of Europe; but rare in England, except in the isle of Ely.

32. Teucrium Chamædrys; *Common* or *Wall Germander.* Leaves subovate, petioled, gash-crenate; flowers axillary, peduncled, tern; stem round, hairy. Root perennial, creeping; corolla reddish-purple, with white globules. There are two varieties, not worth describing. The fresh leaves are bitter and pungent to the taste; their powder destroys worms, and a decoction of them is a good fomentation where the

parts have a tendency to mortify. The leaves, when rubbed betwixt the fingers, emit a strongish smell, somewhat resembling that of Garlic. They are recommended as being excellent in malignant and pestilential fevers, and in weakness and laxities of the stomach and intestines. The juice expressed, with the addition of a little white wine of any kind, is good in obstructions of the viscera; and given alone, is an excellent worm medicine. It has been esteemed chiefly as a mild aperient and corroborant, and was recommended in uterine obstructions, intermitting fevers, rheumatism, and gout. Of the last-mentioned complaint, the Emperor Charles V. is said to have been cured by a vinous decoction of it, with some other herbs, taken for sixty successive days. It has been employed in various forms and combinations, of which the Portland Powder is one of the most celebrated instances. Its qualities seem nearly allied to those of Marrubium or Horehound, and therefore it may be equally useful in asthmatic affections, coughs, and infarctions of the lungs. —Native of many parts of Europe, the islands of the Archipelago, and Palestine, near Jerusalem. In England it is scarcely indigenous, being chiefly found on the ruins of old buildings.

33. Teucrium Heterophyllum; *White-leaved Tree Germander.* Leaves elliptic, crenate; flowers lateral, solitary; lip of the corolla woolly on the outside; branches with different leaves; flowers purple, appearing in June.—Native of Madeira.

34. Teucrium Lucidum; *Shining Germander.* Leaves ovate, acutely gash-serrate, smooth; flowers axillary, tern; stem erect, even. Root perennial, putting forth runners, whence rise the straight, smooth, blackish stems; flowers crimson.—Native of the south of Europe. It may be increased by cuttings, in the same manner as the ninth species; also by seeds, which are plentifully produced. Sow them on a bed of light earth in April: they will come up in six weeks, and may be transplanted in autumn, to where they are intended to remain.

35. Teucrium Flavum; *Yellow-flowered Shrubby Germander.* Leaves cordate, bluntly serrate; bractes quite entire, concave; stem shrubby; flowers racemed, tern; corolla pale yellow.—Native of the south of Europe, and of Barbary.

36. Teucrium Bracteatum; *Bracted Germander.* Stem erect, villose; leaves cordate, crenate; bractes six or more, ovate, acuminate, petioled; whorls distinct; corolla purple. It flowers early in the spring.—Found on the uncultivated hills near Mascar and Tlemsen.

37. Teucrium Montanum; *Dwarf Mountain Germander.* Corymb terminating; leaves lanceolate, quite entire, tomentose beneath. A dwarf bushy shrub, like Thyme, with a strong woody root, and many diffuse, downy, leafy stems; flowers white, appearing in June and July, but seldom succeeded by seeds in England. There is a variety with much smaller leaves, hoary on their under side.—Native of Germany, France, Switzerland, Austria, and Piedmont. This, and the four following species, are all abiding plants: they may be propagated by seeds, which must be procured from the countries where they naturally grow, because they seldom perfect their seeds in England. They should be sown upon a bed of fresh light earth in the spring, and, when they come up, be carefully kept clean from weeds. About the middle of July the plants will be fit to remove, when they may be carefully taken up, and part of them planted on a warm border of dry rubbishy soil, observing to shade them from the sun, and water them till they have taken new root, after which they will require no other culture but to keep them clean from weeds. My advising these, says Mr. Miller, and many other aromatic plants, which are natives of the warmer parts of Europe, to be planted in rubbish, is founded upon long experience of their abiding much longer, and resisting the cold of our winters much better, than when they are in better ground, where they grow much freer, are fuller of moisture, and therefore more liable to be killed by frost.

38. Teucrium Supinum; *Procumbent Germander.* Corymb terminating; leaves linear, rolled back at the edge; flowers white. This is allied to the preceding species.—Native of the mountains of Austria.

39. Teucrium Pyrenaicum; *Pyrenean Germander.* Corymb terminating; leaves cuneiform, orbicular, crenate. This has slender shrubby stalks, which trail close upon the ground: corolla large, one half purple, the other half white. It flowers great part of the summer, but seldom produces seed here.—It grows naturally on the Pyrenean mountains.

40. Teucrium Polium; *Poley.* Spikes roundish; leaves oblong, obtuse, crenate, tomentose, sessile; calix very woolly, obtuse, pointless. The *Common Poley* has the stalks rather herbaceous and trailing, about six inches long, and hoary: the flowers are collected in oblong thick spikes at the end of the branches; they are of a deep yellow colour, and appear in June. It is a native of Spain. The *Narrow-leaved Yellow Poley* has woody stalks, erect, branching, and covered with a hoary down, rising six or eight inches high; flowers collected in roundish spikes at the ends of the branches: they are bright yellow, have woody calices, and appear in June and July.—Native of Spain and Portugal. There are other varieties.

41. Teucrium Capitatum; *Round-headed Germander.* Heads peduncled; leaves lanceolate, crenate, tomentose; stem erect, shrubby, branched at the base; branches round, tomentose, erect; flowers corymbed, headed, close; corolla small, pale yellow, or white. There is a variety with an erect branching stalk, which rises a foot high. The white flowers collect in a corymb at the end of the branches, in July and August.—Native of France, Spain, Barbary, and Silesia.

42. Teucrium Bicolor; *Two-coloured Chili Germander.* Leaves wedge-shaped, obtuse, undivided, or cut; flowers axillary, solitary; calix nearly regular, with ten strong ribs. Stem shrubby, six feet high, with square leafy branches, covered with a very dense short pubescence; corolla externally hairy, white, the middle of its lower lip of a violet-red. —Gathered in the neighbourhood of Talcahuano, in Chili; flowering in November and December.

43. Teucrium Pumilum; *Dwarf Germander.* Heads terminating, sessile; leaves linear, flat, clustered four ways; stem procumbent, tomentose.—Native of hills in Spain, flowering in July and August. This, and all the following species, may be planted in small pots, filled with fresh light undunged earth, and placed in the shade until they have taken new root; then they may be removed into an open situation, where they may remain till the beginning of November, when they should be placed under a common frame, to secure them from the frost in winter, which sometimes destroys these plants: they may also be advantageously mixed with Marum, and other aromatic plants, upon the sloping sides of banks exposed to the sun, or upon little hillocks in a sheltered situation, where, by the variety of their hoary branches, they will make a pretty appearance, and resist the cold much better than when planted in a good soil. They may also be increased by cuttings or slips, planted at the beginning of April, just before they shoot, upon a border exposed to the east; if the season proves dry, they must be watered and shaded until they have taken root; and being

kept clear from weeds till Michaelmas, the plants should be removed where they are designed to remain.

44. Teucrium Spinosum; *Thorny Germander.* Thorny: upper lip of the calices ovate; cornllas resupine; peduncles in pairs. Annual.—Native of the hills and fields of Portugal.

45. Teucrium Corymbiferum; *Corymbiferous Germander.* Frutescent: leaves oblong, crenate, cinereous; flowers corymbed, capitate; peduncles leafy.—Native of Barbary.

46. Teucrium Lævigatum; *Smooth Germander.* Lower leaves multifid, upper three-parted; peduncles solitary, length of the leaves. Herbaceous. The whole plant is very smooth. —Native of Buenos Ayres.

47. Teucrium Trifoliatum; *Three-leaved Poley.* Heads roundish, loose; leaves tern, oblong, revolute, crenate in front, tomentose; stems a span high, ascending, hoary, muricated from the fallen leaves.—Native of Spain and Barbary.

48. Teucrium Gnaphalodes. Flowers solitary, clustered; leaves linear, revolute, crenate, both they and the calices woolly.—Native of Spain.

49. Teucrium Villosum; *Villose Germander.* Leaves elliptic, ovate, acuminate, serrate, petioled, villose; raceme spiked, terminating; calices inflated.—Native of Tongataboo in Australasia.

50. Teucrium Undulatum; *Wave-leaved Germander.* Leaves oblong, waved, subcrenate; corymb terminating; stem shrubby, upright, round, five feet high.—Native of Cochin-china, in hedges.

51. Teucrium Thea; *Tea Germander.* Leaves ovate-lanceolate; stem procumbent; peduncles axillary, three-flowered; flowers white.—Native of Cochin-china among bushes, where the natives use it as tea, to promote digestion, and to relieve an overloaded stomach.

52. Teucrium Trifidum; *Trifid-leaved Germander.* Leaves lanceolate, trifid; peduncles axillary, three-flowered; stem four-cornered, rough, hairy, branched, leafy; corolla purplish.—Native of the Cape.

53. Teucrium Parviflorum; *Small-flowered Germander.* Leaves multifid, linear; raceme decompounded; pedicels elongated, divaricating.—Native of Armenia.

54. Teucrium Brevifolium; *Short-leaved Germander.* Leaves lanceolate, revolute, quite entire, obtuse, hoary; flowers solitary; calices awnless.—Native of Candia.

55. Teucrium Regium; *Royal Germander.* Leaves ovate, toothed in front; floral leaves quite entire, sessile; whorls racemed; stem branched.—Native of Spain.

56. Teucrium Japonicum; *Japanese Germander.* Leaves ovate, doubly serrate; racemes terminating; bractes length of the calix.—Native of Japan.

57. Teucrium Salviastrum; *Sage-like Germander.* Leaves oval, crenulate, wrinkled, tomentose beneath, petioled; raceme directed one way. Root perennial, woody; stem erect, pubescent, somewhat clammy.—Native of Portugal.

58. Teucrium Scordioides; *Scordium-like Germander.* Leaves oblong, cordate, embracing, crenate, lanuginose; flowers axillary; peduncles in pairs; root perennial; flowers larger.—Native of Candia.

59. Teucrium Nitidum; *Glittering Germander.* Leaves ovate, crenate; floral-leaves quite entire; whorls halved, racemed; stem bearded in two rows; corolla purple.—Native of Barbary.

60. Teucrium Thymifolium; *Thyme-leaved Germander.* Heads terminating, few-flowered; leaves petioled, ovate, obtuse, tomentose beneath; stem procumbent; corolla purple. —Native of the kingdom of Valencia in Spain.

61. Teucrium Rotundifolium; *Round-leaved Germander.* Corymbs terminating; leaves roundish, crenate, villose; stem shrubby, decumbent, or hanging from the rocks.—Native of mountains in the kingdom of Valencia in Spain.

62. Teucrium Buxifolium; *Box-leaved Germander.* Corymbs terminating; leaves oval, wrinkled, crenate at the end, villose.—Native of the kingdom of Valencia.

63. Teucrium Flavescens; *Sulphur-coloured Germander.* Heads roundish; and leaves linear-lanceolate, crenate in front, tomentose, summits yellow. This is confounded with Yellow Germander, and agrees with it in stature, in the whiteness and delicacy of the wool on the stem and leaves, and in having the leaves crenate, with a narrower entire base, which however is wider on the flowering-branches: but it differs in having the leaves narrower and lanceolate, the heads small and few-flowered; the calix shorter, clothed not with hairs, but with a close nap, neither angular nor keeled; and the tops are not of a gold, but of an elegant sulphur-colour.— Native of the south of France.

64. Teucrium Valentinum; *Valencia Germander.* Heads roundish, shortly peduncled; leaves linear, crenate; stem erect, hoary.—Native of Valencia.

65. Teucrium Lusitanicum; *Portuguese Germander.* Heads loose; leaves linear, obtuse, crenulate, hoary; stem pubescent, corymbiferous; root woody; flowers erect, the lower ones spreading; corolla white.—Native of Portugal.

66. Teucrium Pycnophyllum; *Thick-leaved Germander.* Heads roundish; leaves linear, revolute, crenate in front, clustered, they and the stem densely tomentose. The whole plant is covered with a very thick white nap; corolla white. —Native of Spain.

67. Teucrium Verticillatum; *Whorled Germander.* Head roundish, sessile; leaves lanceolate, quite entire, revolute, whorled; stem erect, both tomentose.—Native of Spain in the kingdom of Valencia.

68. Teucrium Libanitis; *Rosemary-leaved Germander.* Spikes roundish; leaves clustered, linear, revolute, quite entire, they and the stem tomentose.—Native of Spain.

69. Teucrium Angustissimum; *Narrow-leaved Germander.* Heads terminating, hairy; leaves linear, quite entire, almost naked; stem erect.—Native of Spain.

70. Teucrium Cœleste. Heads terminating, tomentose; leaves linear, quite entire, hoary; stem erect.—Native of Spain, in the kingdom of Valencia.

Thalia; a genus of the class Monandria, order Monogynia. —Generic Character. *Calix:* perianth, scales three, very small, ovate, ciliate, permanent, crowning the germen. *Corolla:* petals five, superior, shrivelling, in a double row; three outer longer, oblong, waved, connate at the base, spreading; the two inner smaller, from erect spreading, oblong, connate with each other and the nectary at the base; nectary petal-shaped, opposite to the smaller petals, lanceolate, acuminate, concave. *Stamina:* filamentum one, awl-shaped, inserted into the nectary; anthera club-shaped. *Pistil:* germen turbinate, crowned with the calix; style filiform, bent in; stigma leafy, bent in. *Pericarp:* drupe oblong, gibbous, one-celled. *Seed:* one, awl-shaped, bent in. *Nut:* bony, two-celled? Essential Character. *Calix:* three-leaved. *Corolla:* five-petalled, two inner petals less. *Nectary:* lanceolate, concave. *Drupe:* with a one-celled nut.——The species are,

1. Thalia Geniculata. Corollas five-petalled; nectary lanceolate; stem taller than a man, quite simple. The American Indians use it as a dart to kill animals.—Native of South America, and the West Indies.

2. Thalia Cannæformis. Corollas six-petalled: nectary bifid, erect; culm solid, round, smooth, branched; branches jointed, divaricating.—Native of Mallicollo, one of the New

Hebrides, and found in the Andaman Isles, and the kingdom of Pegu.

3. Thalia Dealbata. Panicle albid-pulverulent; spathes two-flowered; leaves ovate, revolute at the tip; flowers small, purple.—Grows in the impenetrable swamps of South Carolina. Pursh observes, that T. Millington, Esq. of South Carolina, was the first discoverer of this elegant plant. It has been introduced into the English gardens by the Messrs. Frasers.

Thalictrum; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* none, unless the corolla be taken for it. *Corolla:* petals four, roundish, obtuse, concave, deciduous. *Stamina:* filamenta very many, wider at top, compressed, longer than the corolla; antheræ oblong, erect. *Pistil:* germina many, commonly pedicelled, roundish; styles none; stigmas thickish. *Pericarp:* none. *Seeds:* many, grooved, ovate, tailless. *Observe.* The number of stamina and pistilla are different in the several species. Essential Character. *Calix:* none. *Petals:* four or five. *Seeds:* tailless.——The species are,

1. Thalictrum Alpinum; *Alpine Meadow Rue.* Stem quite simple, almost naked; raceme simple, terminating. The root consists of a few simple fibres, and creeps just below the surface by horizontal runners. It is a delicate little plant, scarcely a span high, and truly alpine. Perennial, flowering early in the summer.—Native of Lapland, Wales, and Scotland, often found in wet black mould in the clefts of rocks, or on the spongy margins of little rills, upon very high mountains. This, with all its congeners, are propagated by parting their roots in September, when the leaves begin to decay, that they may take fresh root before the frost comes on. They may be planted in almost any soil or situation, provided it be not very hot and dry; but they prefer a fresh light soil and a shady situation. Most of them creep so much as to be troublesome in a garden; therefore it is better to confine their roots in pots plunged in the ground. The third, fourth, and eighteenth, are frequently cultivated in gardens; their roots not creeping so much as some of the others, and the flowers having some beauty to recommend them.

2. Thalictrum Fœtidum; *Fetid Meadow Rue.* Stem panicled, filiform, very branching, leafy; leaves triply compound, minutely downy on both sides; flowers drooping; petals slightly hairy; stigmas auricled at the base. Haller observes, that it has all the habit of the ninth species, and can scarcely be distinguished from it, except by a smell like that of Geranium Robertianum, or, to that of cat's urine. It flowers from May to July.—Native of the south of France, &c.

3. Thalictrum Tuberosum; *Tuberous-rooted Meadow Rue.* Flowers five-petalled; root tuberous. The stalks rise a foot and half high, and are naked almost to the top, where they divide into two or three small ones, under each of which is placed one leaf; every division is terminated by a small bunch of pretty large flowers, disposed almost in form of an umbel, each composed of five white petals. It flowers in June.—Native of Spain and the Pyrenees.

4. Thalictrum Cornuti; *Canadian Meadow Rue.* Flowers diœcious; leaflets ovate, trifid; panicles terminating. Root perennial, fibrous; stem two or three feet high; flowers greenish-yellow. There is a variety which is somewhat smaller, and has purple filamenta, which in the other are white. It flowers from May to July.—Native of North America.

5. Thalictrum Dioicum; *Diœcious Meadow Rue.* Flowers diœcious; leaves roundish, cordate, lobed; lobes obtuse; panicles axillary, shorter than the leaf. It flowers in June and July.—Native of North America.

6. Thalictrum Elatum; *Tall Meadow Rue.* Leaves ovate, subcordate, subtrifid; panicle terminating; flowers erect; stem roundish. A hardy perennial, flowering from June to August.—Native of Hungary.

7. Thalictrum Majus; *Great Meadow Rue.* Leaflets roundish, subcordate, trifid, glaucous beneath; panicle leafy; flowers drooping. Stem purplish, panicled; the flowering-branches growing two or three together, the partial flower-stalks generally umbellate. It flowers in June and July.—Native of Austria and Hungary, in woods and bushy places. It has also been discovered on a bushy hill at Baydales near Darlington, and on the margin of Ullswater in Cumberland.

8. Thalictrum Medium; *Middle Meadow Row.* Leaflets oblong-wedge-shaped, acute, trifid, the uppermost undivided, lanceolate; flowers nearly upright. Willdenow observes, that this differs from the next species, in having the leaflets wedge-shaped, the upper ones undivided and lanceolate, and the flowers almost upright, never truly drooping.—Native of Hungary, where it is found upon the hills.

9. Thalictrum Minus; *Small Meadow Rue.* Leaves tripinnate; leaves trifid, glaucous; flowers panicled, drooping. Stem almost upright, a foot high, flexuose, grooved, glaucous, with a bluish bloom, leafy, panicled. Linneus's character of six-parted leaves, has puzzled many persons: Dr. Smith interprets it to mean, that the leaves are compounded in a six-fold order, which is generally near the truth; not as some have understood it, that the leaflets are in six divisions, which can never be the case unless by accident, as they have a central lobe, and consequently an odd number of divisions. It was observed with broad leaves in Wales, which variation ceased when it was transplanted into Yorkshire: although Pollich remarks, that it varies with broader, larger, and smaller leaves.—Native of many parts of Europe, in meadows. In Great Britain it occurs in various parts of the country, in calcareous soils: but being found only in such, it is by no means a common plant; though it is met with on some of the sandy shores of Ireland.

10. Thalictrum Rugosum; *Rough Meadow Rue.* Stem striated; leaves wrinkled, veined; lobules blunt. It flowers in July.—Native of North America.

11. Thalictrum Sibiricum; *Siberian Meadow Rue.* Leaves three-parted; leaflets subreflexed, sharply cut; flowers drooping.—Native of Siberia and Armenia.

12. Thalictrum Squarrosum; *Square Meadow Rue.* Leaflets trifid and undivided; petioles embracing, membranaceous, winged; flowers drooping. This differs from all the preceding species which have nodding flowers, in the structure of its petiole, which is much widened at the base, with orbicular membranaceous wings, toothed at the edge.—Native of Siberia.

13. Thalictrum Purpurascens; *Purplish Meadow Rue.* Leaves three-parted; stem twice as high as the leaves; flowers drooping, purple.—Native of Pennsylvania and Virginia.

14. Thalictrum Angustifolium; *Narrow-leaved Meadow Rue.* Leaflets lanceolate, linear, quite entire; panicle much branched, dense; flowers erect. Stems from two to three feet high; flowers small, in terminating panicles, of an herbaceous white colour. It is allied to the next species, and, in Willdenow's opinion, perhaps only a variety, he having frequently observed some wider leaves of the cultivated plant approaching to those of the Flavum. It flowers in June and July.—Native of Germany, Switzerland, Carniola, and Italy.

15. Thalictrum Flavum; *Common Meadow Rue.* Leaves bipinnate; leaflets trifid. Root yellow, perennial. Stem grooved, three feet high, erect; panicle branched very much,

and contracted; flowers and stamens erect, yellowish-white, with oblong, slightly pointed, yellow anthers. A cataplasm made of the bruised leaves of this plant is a slight blister, and has been known to afford relief in the sciatica: the root dyes wool yellow, and has been formerly used to cure the jaundice, probably from its colour. Cows, horses, goats, and sheep, eat it; but hogs are not fond of it. The narrow-leaved variety mentioned by Lightfoot, is neither rare nor important. Mr. Miller describes another variety as a distinct species; both these are natives of Spain. The plant has obtained its English name *Meadow Rue*, from its place of growth, and a certain vague resemblance to Garden Rue, to which it has no affinity.—Found in moist meadows, and the reedy margins of rivers, throughout Europe, flowering in July.

16. Thalictrum Simplex; *Simple-stalked Meadow Rue.* Stem leafy, quite simple, angular; leaflets linear. This differs from the preceding species, in having the herb half as small again; the flowers nodding, not erect; the petals green, not white; the filamenta fourteen, and purple, not seventeen, and white; the panicle thinner; the leaves narrower. It flowers in May and June.—Native of Sweden, Denmark, Switzerland, and France.

17. Thalictrum Lucidum; *Shining-leaved Meadow Rue.* Stem leafy, grooved; leaves linear, fleshy. Flowers of a yellowish-white colour; they appear in July, and are succeeded by small angular capsules.—Native of France, near Paris, and of Spain.

18. Thalictrum Aquilegifolium; *Columbine-leaved Meadow Rue*, or *Feathered Columbine.* Fruits pendulous, triangular, straight; stem round. Root thick, fibrous; flowers in large terminating panicles. It varies with a green stalk and white stamina, and with a purple stalk and stamina. It flowers from May to July.—Native of Scania, Switzerland, Austria, Carniola, Ingria, Silesia, France, and Italy.

19. Thalictrum Contortum. Fruits pendulous, triangular, contorted; stem subancipital. This is very like the preceding, but is lower, and has white flowers; petals four; stamina sixty; pistilla eight.—Native of Siberia.

20. Thalictrum Petaloideum. Leaflets rounded, obtuse, partly three-lobed; stem nearly leafless; panicle somewhat umbellate; stamens much dilated, linear-obovate; germens sessile.—Native of Siberia.

21. Thalictrum Styloideum. Leaves three-parted, pinnate; styles winged at the base. This is well distinguished by its awl-shaped styles, dilated at each side at the base into a vertical semiorbicular wing.—Native of Siberia.

22. Thalictrum Japonicum. Seeds even; leaves tripinnate; pinnules gash-serrate. The root consists of many capillary bundles.—Native of Japan.

23. Thalictrum Pubescens. Leaves superdecompound; leaflets ovate, subcordate and cuneate at the tip, three-lobed, subrugose above, subtomentose underneath; panicles terminal; pedicels subumbellate, divaricate; flowers polygamous, white.—A tall species, growing on the banks of ditches and rivulets in Pennsylvania and Virginia.

24. Thalictrum Ranunculinum. Leaves simple, five-lobed, serrate; flowers corymbose.—Grows in Carolina.

Thapsia; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal large, of about twenty rays, almost equal in length; partial of as many rays, almost equal: involucre universal none; partial none; perianth proper scarcely to be observed. *Corolla:* universal uniform; florets all fertile; proper of five petals, lanceolate, curved in. *Stamina:* filamenta five, capillary, length of the corolla; antheræ simple. *Pistil:* germen oblong, inferior; styles two, short; stigmas obtuse. *Pericarp:* none; fruit oblong, girt longitudinally by a membrane, bipartite. *Seeds:* two, very large, oblong, convex, acuminate at both ends, girt with a margin, flat on both sides, entire and large, emarginate at top and bottom. Essential Character. *Fruit:* oblong, surrounded by a membrane. *Petals:* uniform, lanceolate, inflexed. *Flowers:* all fertile.——The species are,

1. Thapsia Villosa. Leaflets toothed, villose, coadunate at the base. Root thick, fleshy, in the shape of a Carrot, blackish on the outside, but white within, bitter, and very acrid, with a little aromatic taste; stem spongy, rising about three feet high, dividing upwards into two or three small branches, each terminated by a large umbel of yellow flowers. There is a variety with the seed one half smaller.—Native of stony ground in Spain, Portugal, the south of France, Italy, and Algiers, flowering in June and July.——The plants of this genus are all propagated by seeds, which should be sown in autumn; for if they are kept out of the ground till spring, they often miscarry, or if they grow, they lie a whole year before the plants come up. Sow them in drills in the places where they are designed to remain. The drills should be at least three feet and a half asunder, because the plants spread their leaves very wide. Weed them carefully when they come up in the spring, and draw out some of them wherever they are too close together, to leave room for the rest to grow; but they ought not to be left more than two or three inches apart, for the first year. The autumn following, the remaining part of the plants may be taken up, leaving those which are designed to remain about eighteen inches asunder, and those plants that are taken up may be transplanted into another bed if wanted. After the first year they will require no further care but to keep them clear from weeds; and every spring, just before the plants begin to push out new leaves, the ground should be carefully dug between the plants to loosen it, but the roots must not be injured, as that would cause them to decay. The plants thus managed will continue several years. They delight in a soft loamy soil; and if exposed to the morning sun only, they will thrive better than if placed in a warmer situation.

2. Thapsia Fœtida. Leaflets multifid, narrowed at the base. The stalks rise about two feet high, and are terminated by umbels of small yellow flowers, which appear in July, and are succeeded by flat bordered seeds, which ripen in the beginning of September.—Native of Spain and Italy.

3. Thapsia Asclepium. Leaves digitate; leaflets bipinnate, setaceous, multifid. Root tapering, about the thickness of a man's thumb; bark yellow and wrinkled, the inside white, and abounds with an acrid milky juice; flowers large, yellow, appearing in July.—Native of Apulia, and the Levant.

4. Thapsia Garganica. Leaves pinnate; leaflets pinnatifid; segments lanceolate; petals pale yellow. The bruised root is good for resolving tumors.—Native of Barbary, &c.

5. Thapsia Trifoliata. Leaves ternate, ovate. This has a slender tap-root, shaped like that of Parsley. This stalk is terminated by a small umbel of purple flowers, which appear in July, and are succeeded by compressed channelled seeds, ripening in September.—Native of North America.

6. Thapsia Polygama. Leaves decompound; leaflets acute; involucre pinnatifid at the tip; central flowers abortive.—Native of Barbary, near Bona.

Thea; a genus of the class Polyandria, order Monogynia, or Trigynia.—Generic Character. *Calix:* perianth five-parted, very small, flat, inferior, permanent; segments roundish, obtuse, equal. *Corolla:* petals six, or three to nine, roundish, concave, large, of which two are exterior, and a little

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P. 660.

THALICTRUM AQUILEGIFOLIUM, *Columbine-leaved Meadow Rue.*

P. 661.

THEA ____ *The Tea Tree.*

H. Robinson sc.

Published by Fisher Son & Cº Caxton London 1828

smaller. *Stamina:* filamenta numerous, more than two hundred, filiform, shorter than the corolla, inserted into the receptacle; antheræ cordate, fastened by the back. *Pistil:* germen globular, trigonal; styles three, united at the base, at bottom erect, closely approximating, and as it were united into one above the stamina, diverging, somewhat recurved at the top, after flowering separating to the very base, reflexed at the top; stigmas simple. *Pericarp:* capsule tricoccous, trilocular, gaping at the top in three directions. *Seeds:* solitary, globose, angular on the inward side. *Observe.* The parts of the flower vary much in number, for sometimes the calix is six-parted; the corolla has three petals, or more, as far as nine, of which the six inner ones are larger, and equal to the three outer, a little smaller; stamina as far as two hundred and eighty. Thunberg remarks, that in *Thea Japonica* the calix is five-leaved, ovate, obtuse, concave leaflets; the corolla six-petalled; petals ovate, very blunt, three lower ones smaller; germen somewhat scaly; style filiform, erect, very short: stigmas three, filiform, erect, length of the filamenta. Essential Character. *Corolla:* six or nine petalled. *Calix:* five or six leaved. *Capsules:* tricoccous. ——The only known species is,

1. Thea; *Tea Tree.* Leaves alternate, elliptic, smooth, glossy, of a firm texture, bluntly serrate, except near the base, blunt, and for the most part slightly emarginate at the end, veined on the under side, on very short petioles, round, and gibbous beneath, flattish, and slightly channelled above; corolla white, varying in the number and size of the petals. The stem is from three to six feet high, bushy, with numerous, alternate, round, leafy branches, smooth, except at the very extremity, where the youngest shoots are finely silky, with close-pressed hairs.—Many varieties of this plant are known in China: the distinctions usually regarded in Europe are the following. *Green Teas:* 1. Bing, Imperial, or Bloom Tea, with a large loose leaf, of a light green colour, and a faint delicate smell. 2. Hy-tiang, or Hyson Tea; the leaves are closely curled and small, of a green colour, verging towards blue. There is also another sort with narrow short leaves; and a kind of Green Tea with long narrow leaves. 3. Song-lo, or Singlo, which, with many others not worth enumerating, receives its name from the place where it is cultivated. *Bohea Teas.* 1. Souchong is a superior kind of Congfou Tea. It imparts a yellowish-green colour by infusion, and obtains its name from a province in China. The kind called Padre Souchong has a finer taste and smell: the leaves are large and yellowish, not rolled up, and packed in papers of half a pound each. 2. Cam-ho, or Soum-lo, called after the name of the place where it is gathered. A fragrant Tea, with a violet smell. 3. Congo, which resembles the Common Bohea in the colour of the leaf. 4. Pekao, is known by having the appearance of small white flowers intermixed with it. 5. Common Bohea, or Black Tea, of which there are various kinds.—Besides these, Green and Bohea Teas are sometimes imported in balls, from two ounces to the size of a nutmeg, and of peas. The smallest in this form is well known under the name of Gunpowder Tea. Sometimes the succulent leaves are twisted like packthread, an inch and half or two inches long; three of these are usually tied together at the ends by different-coloured silk threads. The Chinese also make an extract from Tea, which they form into small cakes not much broader than a sixpence, or into rolls of a considerable size. They dissolve it in a large quantity of water, and ascribe powerful effects to it as a sudorific.—The manner of procuring and preparing the leaves, sir George Staunton relates as follows:—The largest and oldest leaves, which are the least esteemed, and destined for the use of the lowest classes of the people, are often exposed to sale, with a little previous manipulation, while they retain that kind of vegetable taste which is common to most fresh plants, but which vanishes in a little time, while the more essential flavour, characteristic of each particular vegetable, remains long without diminution. But the young leaves undergo no inconsiderable preparation, before they are delivered to the purchaser; every leaf passes through the fingers of a female, who rolls it up almost to the form it had assumed before it became expanded in the progress of its growth. It is afterwards placed upon thin plates of earthenware or iron: these plates are much thinner than those made in other countries; and it is confidently denied that any of copper are employed for the same purpose, for scarcely any Chinese utensil is make of that metal, which they chiefly use for coin. These earthen, or iron, and possibly copper plates, are then placed over a charcoal fire, which draws all remaining moisture from the leaves, rendering them dry and crisp; for the colour and astringency of Green Tea, notwithstanding its verdigris taste, is said to be owing to the early period at which the leaves are plucked, because they are then, like unripe fruit, green and acrid. Chinese drawings, though rudely executed, exhibit a faithful picture of what they are intended to represent. From a set of these, giving the whole process of gathering and manufacturing the Tea, we learn that it grows principally in hilly countries, upon rocky summits and steep declivities. It appears also from the drawings, that the trees in general are not much higher than a man, as the gatherers are always represented on the ground, making use of hooked sticks, which seem intended to draw the branches towards them, when they hang over places difficult of access. They pick the leaves, as soon as gathered, into different sorts; and dry them in a range of stoves, like those in a chemist's laboratory. It is not known what arts are used used in China, to give a variety of colour and flavour to their Teas, which cannot all be satisfactorily accounted for from soil, situation, and the different seasons at which the leaves are gathered. In Japan, the produce is chiefly consumed within the country; whereas, in China, the exportation, we know, is very considerable, and the temptation great to exercise the arts of sophistication, in which it is notorious that the Chinese are not deficient In the Chinese drawings, already mentioned, there are figures of several persons, apparently separating the different kinds of Tea, and drying it in the sun, with several baskets standing near them with a very white substance, and in considerable quantity. To what use this may be applied is uncertain, as well as what the substance represented is; yet there is little doubt that it is something used in the manufacturing of Tea, because the Chinese do not introduce any thing into their pieces but what relates in some respect to the subject. We are better acquainted with a vegetable substance which is employed in giving a flavour to Tea; it is the Olea Fragrans, the flowers of which are frequently to be met with in Teas imported from China; and the plant thus used is not now uncommon in our stoves. The flowers of the Arabian Jasmin, and of some other plants, as the Camellia Sasanqua, are used for the same purpose; on which account the Chinese call the latter Tea-flower, and cultivate it in vast abundance, but principally for its nut, which yields an esculent oil, equal to the best which comes from Florence.—The Tea plant is particularly valuable from the facility of its culture on the sides and upon the very summits of mountains, in places unfit for any thing else. The late Dr. Lettsom, whose authority is of great weight, thinks that some art is used in dyeing Teas, because they yield a much darker and less elegant infusion than they did formerly; and

the quality in general has become inferior, since the demand has been increased. He says: I remember, half a century ago, that lumps of Catechu, which is an extract from a species of Mimosa, and vulgarly called Terra Japonica, were frequently found in the chests of Bohea Teas, and that my father, by way of experiment, dried the green Tea that had been used in the family, and, just before it was dry, scraped over it some of the Terra Japonica. It curled up very well, and passed with the servants for the same kind of Tea that they were accustomed to drink. From this, Dr. Lettsom infers, that we have at least the satisfaction of knowing, that if the above be the drug employed, it is not pernicious.—We are not positively informed what motive first induced the natives of China and Japan first to use an infusion of Tea; but it is highly probable that it was in order to correct the water, which is brackish and ill-tasted in many parts of those countries. Sir George Staunton remarks, that persons of rank in China are so careful about the quality of the water intended for their own consumption, that they seldom drink any without its being distilled; and every Chinese infuses Tea, or some other vegetable supposed to be salubrious, in the water which he uses. Like beer in England, Tea is sold in public houses in every town; also by the side of public roads, and on the banks of rivers and canals, both in China and Japan: nor is it unusual for the burdened traveller to lay down his load, refresh himself with a cup of warm Tea, and then pursue his journey. These qualities of taking off the ill taste of water, and of refreshing after fatigue, have been often noticed in other countries. Thus Kalm says, If Tea be useful, it must be so in travelling through a desert country, where wine or other liquors cannot be conveniently carried, and where the water is generally unfit for use, being full of insects. In such cases, it is very pleasant when boiled, and Tea is infused. It certainly must be allowed, that Tea proves a grateful diluent, and agreeable sedative, to persons of full habits, after hearty meals, when the stomach is oppressed, the head pained, and the pulse beats high; but to persons of consumptive habits, and where there is any taint of scrofula in the constitution, it is exceedingly deleterious. Neither the Chinese nor the Japanese ever use this herb until it has been kept at least a year, because when fresh it is said to prove narcotic, and to disorder the senses. It does not appear whether they are kind enough to keep back their Teas from the European market for the same period, out of equal regard for the health of their customers; and from the effects produced by its consumption, in this country, we really fear, that in the latter instance they are less considerate. The Chinese pour hot water on the herb, and draw off the infusion, in the same manner as is now practised by Europeans; but they drink it without sugar or milk. The Japanese reduce it to a fine powder, by grinding the leaves in a hand-mill; tea-cups are filled with hot water, into which they put as much of the powder as might lie on the point of a moderate-sized knife, stirring it about while the liquor foams, and sipping it while warm. The common people, who have a coarser Tea, boil it for some time in water, and use the liquor for common drink. Early in the morning, the kettle, filled with water, is hung over the fire, and the Tea is either put in, enclosed in a bag, or by means of a basket pressed to the bottom of the vessel. The coarsest sort only is used in this manner; the qualities of which, being more fixed, would probably not be so fully extracted by infusion. Tea indeed is the common beverage of all the labouring people of China, who are hardly ever represented at work of any kind, but the tea-pot and tea-cup appear as their accompaniments: reapers, threshers and all who work out of doors as well as within, have these attendants.—With respect to the qualities of Tea, it appears that an infusion of the Green kind destroys the sensibility of the nerves and the irritability of the muscles; and that it gives out, in distillation, an odorous water, which is powerfully narcotic. That the recent plant contains such an odorous narcotic power, we might presume from the necessity which the Chinese find of drying it with much heat, before it can be brought into use; and that even after such preparation they must abstain from using it for a year or more, that is, till its volatile parts are still farther dissipated; and it is said, that unless they use this precaution, the Tea manifestly shews strong narcotic powers. Even in this country the more odorous Teas often display their sedative powers, in weakening the nerves of the stomach, and indeed of the whole system. Its effects, however, seem to be very different in different persons; and hence the contradictory accounts that are given. But if we consider the difference of constitution, which occasions some variation in the operating of the same medicine, and of which there is a remarkable proof in the operation of opium; if to this we add the fallacy arising from the condition of the Tea employed, which is often so inert as to have little or no effect; and if we still add to this the power of habit, which can destroy the efficacy of the most powerful substances, we shall not allow the various and even contradictory reports of its effects to alter our judgment with respect to its ordinary and more general qualities in affecting the human body; which qualities are, from experiments and observations, clearly ascertained to be narcotic and sedative. It is not at the same time to be denied, that Tea may sometimes have good effects: it is very possible that in certain persons, taken in moderate quantities, it may, like other narcotics, prove exhilarating; or, like them, have some effect in taking off irritability, or in quieting some irregularities of the nervous system. As its bad effects have been often imputed to the warm water in which it has been infused. so there is no doubt that some of its good effects may also be ascribed to the same cause, and particularly its being so often grateful after a full meal. After all, the infusion of Tea, as it is commonly taken in England, with a competent quantity of cream, or milk and sugar, cannot be very narcotic and sedative; especially as, after a long voyage, it is kept some time in the East India Company's warehouses; and the finer sorts of it are hardly so much in request as formerly. Nor can it be an unwholesome beverage for sedentary persons, and such as live freely, provided it be not taken too hot, nor in immoderate quantities, or without solid food. For the lower class of people, who in general procure little animal food, Tea is a bad succedaneum for beer; and is besides, with its concomitants, far too expensive.—This now universal article of daily diet, was not drunk in Europe before the commencement of the seventeenth century. Some Dutch adventurers, seeking about that time for such objects as might fetch a price in China, and hearing of the general usage there of a beverage from the plant of this country, bethought themselves of trying how far an European plant, of supposed great virtues, might also be relished by the Chinese, and thereby become a saleable commodity among them. Accordingly, they introduced to them the herb *Sage*, once so much extolled by the Salernian School of Physic, as a powerful preservative of health; the Dutch accepting, in return, the Chinese Tea, which they brought to Europe. The European herb did not continue long, at least in use, in China; but the consumption of Tea has been gradually increasing in Europe ever since, and is the staple article of our vast East Indian Commerce. The first introduction of Tea into England was about 1660, when the first

mention of it was made in the statute book, and a duty of fourpence a gallon laid on the liquor made and sold in all coffee-houses: the price, six years afterwards, was sixty shillings a pound.—*Propagation and Culture.* In Japan, this tree is cultivated round the borders of rice and corn fields, without any regard to the soil; the seeds contained in the seed-vessels, from six to twelve or fifteen, are put into one hole, four or five inches deep. The seeds contain a large proportion of oil, which is liable soon to turn rancid; hence scarcely a fifth part of them germinate; and this makes it necessary to plant so many together. The seeds vegetate without any further care: but the more industrious annually remove the weeds, and manure the land. The leaves are not fit to be plucked before the third year's growth; and in seven or ten years the tree is generally cut down, and abundance of fresh shoots spring up. In China, wherever it is regularly cultivated, it rises from the seed, sown in rows at the distance of about four feet from each other, in land kept free from weeds. It is seldom sown on flat marshy ground, which is preserved for rice; but vast tracts of hilly land are planted with it, especially in the province of Fo-kien. Its perpendicular growth is impeded, for the convenience of collecting the leaves. Its long and tender branches spring up almost from the root, without any intervening naked trunk. It is cultivated in several other provinces, but seldom more than thirty degrees north of the equator. It thrives best between that parallel and the line that separates the temperate from the torrid zone. The southern countries of Europe, and some provinces of North America, would suit, particularly the latter, the heat there in summer being such, that vegetables make quicker and more early shoots, and therefore acquire more strength and firmness before the winter commences.—To propagate the Tea-tree in Europe, it is necessary to procure seeds from China. Care must be taken that they be fresh, sound, ripe, white, plump, and internally moist. After being well dried in the sun, they may be enclosed in bees-wax, or left in their capsules; and may be put into very close tin canisters. Thouin, in his directions to the unfortunate Perouse, recommends these and other seeds to be placed in alternate layers of earth or sand, in tin boxes closed up exactly, and placed in solid cases, covered with wax-cloth; the boxes to be placed in a part of the ship least accessible to moisture, and the most sheltered from extreme heat or cold. American seeds are often brought over, by putting them into a box, not made too close, upon alternate layers of Moss, in such a manner as to admit the seeds to vegetate. This might be tried with the seeds of the Tea-tree; and, to succeed more certainly, some of the seeds might be sown in pots or boxes, when the vessel arrives at St. Helena, and after passing the tropic of cancer, near the latitude of thirty degrees north. But the best method seems to be, to sow ripe seeds in good light earth, in boxes, upon leaving Canton, covering them with wire, to prevent rats and other vermin coming to them; and taking care, during the passage, that they are not too freely exposed to the air, nor to the spray of the sea. A little fresh or rain-water should now and then be sprinkled over them; and when the seed-plants appear, they should be kept moist, and out of the burning sun. If young plants can be procured in China, they may be sent over in a growing state in boxes, forty inches long by twenty broad, and as much in depth, having a few holes bored through the bottom. When the trees arrive in England, they must be kept in a green-house during the winter, and in the open air during the summer. If they come in bad condition, it may be as well to plunge the pots into which they are transplanted in a gentle hot-bed, or to set them in the tan-pit, to make them strike and shoot more freely. Though it will not at present bear the rigour of our winters in the open air, yet it is not impossible but it may gradually become naturalized to our climate, like the Magnolia, among several other trees and shrubs; especially if it were to be brought from the coldest provinces of China, where it grows, or from the parts of Europe a little to the southward of us, when it shall have been naturalized there. This tree may also be freely increased from cuttings, in the same manner with Gardenia; and will also probably grow from layers laid down in the autumn or spring.

Thelygonum; a genus of the class Monœcia, order Polyandria.—Generic Character. *Male Flower. Calix:* perianth one-leafed, turbinate, semibifid; segments revolute. *Corolla:* none. *Stamina:* filamenta very many, twelve or more, erect, length of the calix; antheræ simple. *Female Flower* on the same plant. *Calix:* perianth minute, of two erect, lanceolate, acute, lateral leaves, permanent. *Corolla:* none. *Pistil:* germen globular; style filiform, long; stigma simple. *Pericarp:* capsule coriaceous, globular, one-celled. *Seed:* one, globular, with a callous appendicle. Essential Character. *Male. Calix:* bifid. *Corolla:* none. *Stamina:* commonly twelve. *Female. Calix:* lateral, two-leaved. *Corolla:* none. *Style:* one. *Capsule:* coriaceous, one-celled, one-seeded.——The only known species is,

1. Thelygonum Cynocrambe; *Dog's Mercury.* Leaves ovate, bluntish, even, nerved, slightly marked with lines, oleraceous, rugged at the edge; the lower ones opposite, the upper alternate, ending in the petioles, which are the length of the leaves, and connected on each side by a three-toothed, membranaceous, wide, short stipule; root annual, simple, cylindrical, with many fibres; stems round, diffused, flexuose, succulent; branches opposite, divaricate, from the axils of the opposite leaves; flowers small, whitish. —Native of the south of Europe, as well as Asia, in waste ground and the fissures of rocks, especially in shady or moist places.

Theobroma; a genus of the class Polyadelphia, order Decandria.—Generic Character. *Calix:* perianth five-leaved; leaflets lanceolate-acute, spreading, deciduous. *Corolla:* petals five, longer than the calix; claws wide, arched, concave like a helmet, emarginate at the tip, scored internally with a thick triple line, inserted into the nectary at the base; borders roundish, acuminate, spreading, each narrowed at the base into a small stalk, which is from upright recurved, and fastened into the claw; nectary a short little pitcher, putting forth five little horns, which are awl-shaped, long, erect, acuminate, bent in and converging, decurrent along the pitcher. *Stamina:* filamenta five, filiform, erect, bent outwards at top, lying within the claws of the petals, growing externally to the nectary, alternate with and shorter than the horns; antheræ on each filamentum two, one on each side at the tip, vertical, two-lobed, one superior, the other inferior. *Pistil:* germen ovate; style filiform, striated, a little longer than the stamina; stigma five-cleft. *Pericarp:* capsule oblong, coriaceous, unequal, five-cornered, five-celled, valveless, not opening. *Seeds:* very many, subovate, nestling in a buttery pulp, fastened to a central columnar receptacle. Essential Character. *Calix:* five-leaved. *Petals:* five, arched. *Nectary:* five-horned. *Filamenta:* five, within the claws of the petals, growing externally to the nectary, having two antheræ on each.——The only known species is,

1. Theobroma Cacao; *Chocolate-nut Tree.* Leaves lanceolate-oblong, bright green, quite entire, alternate, from nine to sixteen inches long, and three or four inches wide at most, on a petiole an inch in length, and thickened at both

ends; peduncles slender, about eight or ten together, chiefly from the scars of the fallen leaves, one of them only for the most part fruitful, the rest abortive; flowers small, reddish, inodorous; fruits smooth, yellow, red, or of both colours, about three inches in diameter; rind fleshy, nearly half an inch in thickness, flesh-coloured within; pulp whitish, the consistence of butter, separating from the rind in a state of ripeness, and adhering to it only by filamenta, which penetrate it, and reach to the seeds: hence it is known when the seeds are ripe, by the rattling of the capsule when it is shaken. The pulp has a sweet and not unpleasant taste, with a slight acidity; it is sucked and eaten raw by the natives, and may easily be separated into as many parts as there are seeds, to which it adheres strongly; and they are wrapped up in it, so that each seed seems to have its own proper pulp. The seeds are about twenty-five in number; when fresh, they are of a flesh-colour. Gathered unripe, and preserved in sugar, they are very grateful to the palate. According to Browne, this tree seldom exceeds six or seven inches in diameter, or rises above fifteen or sixteen feet in height. It is very beautiful, and in general extremely engaging to the sight, when charged with fruit, which grows from all parts of the trunk and larger branches indiscriminately. When the seeds are loose, and rattle in the pods, they are pulled off and opened, and the kernels picked out and exposed daily to the sun, until they are thoroughly cured, and fit for the stove or market. These seeds are remarkably nourishing, and agreeable to most people; which occasions them to be commonly kept in most houses in America, as a necessary part of the provisions of the family. They are generally ground or pounded very fine, and made into paste: they are much charged with oil, but mix well with milk or water. It is said to have been in use among the native Indians before the arrival of the Spaniards. It is much esteemed in all the southern colonies of America, and well known to make a principal part of the nourishment of most of the older part of the inhabitants.—There are two principal varieties of the fruit; one long, of an oval-oblong form, obtusely attenuated at the end, ten-grooved, and having the surface irregular with little lumps, or somewhat warted; the other not at all warted, scarcely grooved, as thick as the other variety, but shorter; both are commonly found wild in Jamaica. This tree is cultivated in many of the West India islands belonging to the English; but the hurricanes, and the neglect of our planters, have so diminished the number of the trees, that for some years the French and Spaniards have supplied us with the article.—Native of South America, and found in great plenty in several places between the tropics, but particularly at Caracca and Carthagena, on the river of Amazons, the isthmus of Darien, at Honduras, Guatimala, and Nicaragua.—*Propagation and Culture.* As this tree may be advantageously cultivated in those parts of our West India islands where the Sugar-Cane will not thrive, we shall first state the mode of cultivating there for profit, and then at home for curiosity. Make your plantation of Chocolate-trees in a place where they may be protected from strong winds, by which, if exposed, they will be soon destroyed. In those places where torrents of water have deposited the earth, they will thrive exceedingly, especially where the gullies are broad and deep, because the soil is generally rich and moist, which is what these trees require. Where there are not a sufficient number of these gullies, plant them where they will be well sheltered by large trees; or if there be no trees already grown, surround the spot where you design to plant the Chocolate-trees, with four rows of plants of such trees as are of the quickest growth, and within these rows there should be some Plantain-trees planted at proper distances, which, being very quick of growth, and the leaves very large, will afford a kindly shelter to the Chocolate seedlings planted between them. These trees, when cultivated, seldom exceed fourteen or fifteen feet in height, nor do they spread their branches very wide; hence if the Plantain-trees be placed in rows about twenty-four feet asunder, there will be room anough for two rows of Chocolate-trees between each row of Plantains; and if they are placed at ten feet distance in the rows, there will be space sufficient. Those trees which are found wild in uncultivated places are generally of much larger growth, which may be occasioned by the other trees among which they are found growing; for being protected from the winds by these, they are not so much in danger therefrom as those which are cultivated; and the other trees closely surrounding them, will naturally draw them up to a greater height: however, that is not a desirable quality in these trees; the lower they are, the better the fruit may be gathered without hurting the trees, and the less they are exposed to the injuries of the weather; so that the inhabitants never desire to have their trees above twelve or fourteen feet high. The soil upon which these trees thrive to most advantage, is a moist rich deep earth, for they generally send forth one tap-root, which runs very deep into the ground; hence, wherever they meet with a rocky bottom near the surface, they seldom thrive, nor are they of long continuance; but in a deep rich moist soil they will produce fruit in pretty good plenty the third year from seed, and will continue fruitful for several years after. Before the plantation is begun, the ground should be well prepared by digging it deep, and clearing it from the roots of the trees and noxious plants, which, if suffered to remain in the ground, will shoot up again after the first rain, and greatly obstruct the growth of the plants, till it will be almost impossible to clear the ground of these roots without greatly injuring the Chocolate plants after they have come up. When the ground is thus prepared, the rows should be marked out by a line, where the nuts are to be planted, so as that they may be placed in a quicunx order, at equal distance every way, or at least that the Plantain-trees between them may form a quincunx with the two rows of Chocolate-trees, which are placed between each row of them. In making a plantation of Chocolate-nut Trees, the nuts must be planted where the trees are to remain; for if the plants be transplanted they seldom live, and those which survive will never make thriving trees; for if the tap-root be any way broken or injured, the tree commonly decays. The nuts should always be planted in a rainy season; and as the fruit ripens at two different seasons, at Midsummer and at Christmas, the plantation may be made at either of those times; but the chief care must be to choose such nuts as are perfectly ripe and sound, otherwise the whole trouble and expense will be lost. The manner of planting the nuts is, to make three holes in the ground, within two or three inches of each other, at the place where every tree is to stand; and into each of these holes should be one sound nut planted, about two inches deep, covering them gently with earth. Three nuts are planted, because they seldom all succeed, or if most of them grow, the plants will not be all equally vigorous; hence it will be easy, even after one year's growth, to draw up all the weak unpromising plants, and to leave the most vigorous, in doing which great care must be taken not to injure or disturb the roots of those which are to remain. When these trees appear above the ground, they are very tender, and liable to great injury from the strong winds, the scorching sun, or great droughts. On these accounts the planters choose a sheltered situation, or plant

trees to form a shelter. They also contrive, if possible, to have the plantation near a river, for the conveniency of watering the plants during the first season, until they have made strong roots, and are capable of drawing their nourishment from some depth in the earth, where they meet with moisture. In order to shelter the plants from the scorching rays of the sun, they generally plant two rows of Cassava between each row of Chocolate-trees, which will grow about seven or eight feet high, and screen the young plants from the violence of the sun in the first season, after which time they will be in less danger of injury therefrom; and in the following season, when the Cassava is taken up for use, the ground should be worked between the young plants, taking care not to injure the roots in this operation. This method of planting the Cassava between the young Chocolate-trees, is of great advantage to the planter; for when the roots of the Cassava are taken up for use, it will defray the expense of keeping the ground free from weeds, without which the young plants will come to nothing. The Plantains also, which will be fit to cut in about twelve months after planting, will defray the whole expense of preparing the ground, so that the produce of the Chocolate-trees will be neat profit; for as the Plantains produce fruit and decay, they will be succeeded by suckers, which will produce fruit in eight months after; whereby there will be a continual supply of food for the negroes, which will more than pay for keeping the ground wrought and clear from weeds, until the Chocolate-trees begin to produce fruit, which is generally in the third year after planting. In about seven or eight days after the Chocolate-nuts are planted, the young plants will begin to appear above ground, and should be carefully examined to see if any of them be attacked by insects, in which case, if the insects are not timely destroyed, they will soon devour all the young plants; or, if there should be any weeds produced near the plants, they should be carefully cut down with a hoe; in doing which, great care should be taken that neither the tender shoot, nor the rind of the bark, be injured. About twenty days after the plants have appeared, they will be five or six inches high, and have four or six leaves, according to the strength of the plants. These leaves are always produced by pairs, opposite to each other, as are also the branches, so that they make very regular handsome heads, if they are not injured by winds. In ten or twelve months they will be two feet and a half high, and have fourteen or sixteen leaves. By this time the Cassava, which was planted between the rows of Chocolate plants, will have large roots fit for use, therefore should be taken up, and the ground being then wrought over again, will greatly encourage the young plants. In two years they will have grown to the height of three feet and a half, or sometimes four feet, many of which will begin to flower; but the careful planters always pull off these blossoms, for if they be permitted to remain to produce fruit, they will so much weaken the trees that they will never recover. When the plants are two years and a half old, they will produce flowers again, some of which are often left to bear fruit: but the most curious planters pluck off all these, and never leave any to produce fruit until the third year; and then but a few in proportion to the strength of the trees, which causes them to produce larger and better fruit. The fourth year they suffer their trees to bear a moderate crop, but they generally pull off some flowers from those trees which are weak, that they may recover strength before they are too old. From the time when the flowers fall off, to the maturity of the fruit, is about four months. It is easy to know when the fruit is ripe by the colour of the pods, which become yellow on the side next the sun. In gathering the fruit, they generally place a negro to each row of trees; who being furnished with a basket, goes from tree to tree, and cuts off all those which are ripe. When the basket is full, he carries the fruit and lays it in a heap at one end of the plantation, where, after the whole is gathered, they cut the pods lengthways, and take out all the nuts, being careful to divest them of the pulp, which closely adheres to them, and then they carry them to the house, where they lay them in large casks, or other vessels of wood raised above ground, and cover them with leaves of the Indian Reed and mats, upon which they lay some boards, putting on them stones to press the whole down close. In these vessels the nuts are kept four or five days; during which time they must be stirred and turned every morning, to prevent too much fermentation. In this short time they change from being white to a dark red or brown colour; and it is said, that without a proper degree of fermentation they will not keep, but will sprout in damp places, and shrivel and dry too much if exposed to heat. After the nuts have been thus fermented, they should be taken out of the vessels, and spread on coarse cloths, where they may be exposed to the sun and wind; but at night, or in rainy weather, they must be taken under shelter. In fine weather, if carefully turned from side to side, they will dry in three days' time, and, when perfectly dry, may be put up in boxes or sacks, and preserved in a dry place until they are shipped off or consumed. These trees, if planted in a good soil, will continue vigorous and fruitful twenty-five or thirty years. The leaves being large, make a great litter on the ground when they fall. They are more profitable than the Sugar Cane, and the crop is not so uncertain; but besides the ordinary care of digging, hoeing, and manuring the plantations of Chocolate-trees, it is necessary to prune off the decayed branches, and to remove small and ill-placed branches wherever they may be produced. This should be cautiously performed, for no vigorous branches ought to be shortened, nor any large amputation made on these trees; because they abound with a soft glutinous milky juice, which will flow out many days whenever they are wounded, and must greatly weaken the trees. Such branches, however, as have their extreme parts decayed, should be cut off, to prevent the infection from spreading further; and those which are much decayed, should be taken off close to the stem of the tree in dry weather, soon after the fruit is gathered.—*Cultivation in Europe.* Plant the nuts in boxes of earth soon after they become ripe. Place the boxes in a shady situation, and water them frequently. In a fortnight the plants will begin to appear, and should be carefully watered in dry weather, and protected from the violent heat of the sun, which is very injurious to these plants, especially while they are young. Keep them perfectly free from weeds. When they are grown strong enough to transport, they may be shipped, and should be placed where they may be screened from strong winds, salt water, and the violent heat of the sun. During their passage they must be frequently refreshed with water in small quantities; and should be protected as much as possible from the cold, when they arrive in the northern latitudes. As soon as they are landed in this country, take them carefully out of their boxes, and transplant each of them into a separate pot filled with light rich earth, and plunged into a moderate hot-bed of tanner's bark, being careful to cover the glasses in the heat of the day, and to screen the plants from the sun. Water them often, but sparingly. Let them remain till Michaelmas in the hot-bed, then plunge them into the tan in the warmest part of the bark-stove. During winter water them frequently in small quantities, but more plentifully in summer. They are too tender to endure the open air here

even in the hottest season, and must therefore always remain in the bark-stove, observing to admit a large share of fresh air in warm weather, and to keep them very warm in winter. As the plants increase in bulk, they should be shifted into larger pots; and in doing this, particular care is necessary not to tear or bruise their roots, which often kills them. They must never be overpotted, as that causes slow but sure destruction. Their leaves should be often washed, to clear them from filth, which they are very subject to contract by remaining constantly in the house. This filth becomes a harbour for small insects, which infect and gradually destroy the plants. When the trees are obtained from abroad, they may be increased by cuttings as Gardenia, which see.

Theophrasta; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, permanent; segments oblong, ciliate at the edge. *Corolla:* one-petalled, permanent; tube length of the calix, bell-shaped; segments five, oblong, erect, spreading. *Stamina:* filamenta five, below the middle of the tube, inserted into a membrane which surrounds the bottom internally, shorter than the corolla; antheræ acuminate. *Pistil:* germen roundish; style length of the stamina, thick; stigma blunt, perforated. *Pericarp:* fruit large, roundish, corticose, one-celled, many-seeded. *Seeds:* oblong, shining, fastened to a fleshy juicy receptacle, which is situated at the base. Essential Character. *Corolla:* bell-shaped, with oblong, erect, spreading segments. *Fruit:* one-celled, very large, roundish, many-seeded.——The species are,

1. Theophrasta Americana. Leaves obtuse; clusters terminal, erect. Stem shrubby, one or two feet high, erect, simple, leafy in its upper half, round, thorny, clothed with rusty down; leaves on very short petioles, opposite, or inserted into the stem in whorls, erect, elongated, attenuated at the base, blunt at the end, very rigid, serrate, the serratures spiny, alternately inflected and reflected; spines standing out, small, but rigid, black at the outmost tip; petioles pressed close to the stem, thick, rufous; racemes short, terminal, from the middle of the terminating leaves, many-flowered; peduncles numerous, curved, short, one-flowered; fruit two inches in diameter, yellow, brittle, often hollow or empty, its receptacle juicy at the bottom; seeds black, hard, fastened at the base, but free above. The fruit is not properly a berry, nor is it a capsule, for it does not open, but it is corticose, and the greater part of it is often empty.—Native of dry coppices in Hispaniola.

2. Theophrasta Longifolia. Leaves acute; clusters lateral, drooping. This much resembles the preceding, but is distinct in having the leaves attenuated at both ends, with the teeth acute and mucronate.—Native of America; found at the Caraccas.

Thesium; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, permanent, half five-cleft; segments half-lanceolate, erect, obtuse. *Corolla:* none, unless the calix internally coloured may be regarded as such. *Stamina:* filamenta five, awl-shaped, inserted into the base of the calicine segments, shorter than the calix; antheræ roundish. *Pistil:* germen inferior, growing upon the base of the calix; style filiform, length of the stamina; stigma thickish, obtuse. *Pericarp:* none. The calix contains the seed in its bottom, and does not open. *Seed:* one, roundish, covered. *Observe.* The second species takes one-fifth from the fructification. Essential Character. *Calix:* one-leafed, into which the stamina are inserted. *Corolla:* none. *Nut:* inferior, one-seeded.——The species are,

1. Thesium Linophyllum; *Flax-leaved Thesium,* or *Bastard Toad Flax.* Spike branched; bractes in threes; leaves linear-lanceolate; calix-tube very short. Root, woody, branched, crooked, whitish, perennial; stems ascending, angular, five to ten inches high, little branched; leaves numerous, alternate, entire, somewhat succulent, roughish at the edge; flowers in spikes, mostly branched, and sometimes so compound as to form a panicle, solitary, on alternate erect pedicels, with three lanceolate-acute bractes close to each flower. The herb is scarcely bitter, but a little saltish. Willdenow gives three varieties, which are owing to a difference of soil and situation. The panicle, he remarks, in this species is formed of simple-bracted racemes placed in the axils of the upper leaves. It flowers in July.—Native of Europe, Siberia, and Barbary; chiefly found in a calcareous soil. It has been long observed in several parts of Cambridgeshire, and in Suffolk, Norfolk, Oxfordshire, and Dorsetshire, usually growing among grass, which it so much resembles at a distance, as not to be readily discerned.

2. Thesium Alpinum; *Alpine Thesium.* Raceme leafed; leaves linear. Root perennial, fibrous, of a dirty white colour; stems many, decumbent in a ring, sometimes, but seldom, a little upright, half a foot long, round, smooth, commonly simple. This species may be distinguished by the following marks: the buds proceed from the old stems; the leaves are more spreading, quite linear, nerveless, more rigid, and fewer; the stems are half a foot long; the panicle equals half the length of the whole stem, and points one way; the fruits are oval, striated, and furnished with a sort of neck by the contraction of the calicine segments. It varies, according to Willdenow, with an erect and decumbent stem. The raceme is formed of one-flowered, bracted, axillary peduncles, on the upper part of the stem.—Native of the mountains of Italy, Germany, Austria, Switzerland, the south of France, Mount Atlas, and Siberia.

3. Thesium Humile; *Dwarf Thesium.* Leaves linear, somewhat fleshy; flowers axillary, sessile, five-cleft. Root annual; stem herbaceous, erect, scarcely a hand in height, branching immediately from the base; branches smooth, somewhat subdivided, angular, height of the stem.—Native of the kingdom of Tunis.

4. Thesium Lineatum. Leaves linear; stem round, angular, leafless below; branches erect, divaricating; flowers axillary, peduncled.—Native of the Cape.

5. Thesium Squarrosum. Leaves linear, subulate, recurved, and reflexed; stem round; flowers axillary, sessile.—Native of the Cape.

6. Thesium Frisea; *Trailing Thesium.* Flowers subspiked, directed one way, ciliate-woolly; leaves awl-shaped; stems simple, a hand high, hardish; fruit ovate, much wrinkled, the size of a Coriander seed, villose at the tip within with the permanent calix.—Found at the Cape.

7. Thesium Funale; *Flexible Thesium.* Flowers in spikes; calices ciliate; stem suffruticose; leaves awl-shaped, very short. This is a shrub, having the appearance of Restis Capensis, and almost naked, with a very rushy appearance; branches numerous, alternate, clustered, wand-like, simple, round, filiform.—Native of the Cape.

8. Thesium Spicatum; *Spike-flowered Thesium.* Flowers in spikes, even; leaves awl-shaped, very short, and very remote; stem erect, stiff, somewhat angular, proliferous, three feet high, the thickness of a quill. It is very distinct from the preceding, the stem not being flexible like a cord; the spikes not very narrow; and the bractes between the flowers not slender like a needle.—Found near the Cape.

9. Thesium Capitatum; *Head-flowered Thesium.* Flowers in heads, sessile, terminating; leaves three-sided, even;

bractes ovate. Stem shrubby, hard; branches alternate, remote, the upper ones gradually longer.—Native of the Cape.

10. Thesium Strictum; *Straight Thesium.* Flowers in umbels; leaves linear, decurrent. Stem shrubby, branched, angular as in Broom.—Native of the Cape.

11. Thesium Umbellatum; *Umbelled Thesium.* Flowers in umbels; leaves oblong; root perennial. It flowers here in June.—Native of Virginia and Pennsylvania.

12. Thesium Fragile; *Brittle Thesium.* Leaves ovate, three-sided, keeled, decurrent; stem angular; flowers axillary, sessile. This has the habit of a Salsola. It is a very brittle plant, with leaves so short as seeming to have none.—Native of the Cape.

13. Thesium Scabrum; *Rugged Thesium.* Heads of flowers peduncled; leaves three-sided, very rugged along the edge and keel. This very much resembles the ninth species, but the heads are on a long naked peduncle, and the leaves are only half the size.—Native of the Cape.

14. Thesium Paniculatum; *Panicled Thesium.* Wholly panicled: leaves lanceolate, remote; branches angular, diffused; flowers terminating; stem somewhat woody, a foot high. Many of the flowers are abortive.—Native of the Cape.

15. Thesium Amplexicaule; *Heart-leaved Thesium.* Flowers subspiked, directed one way, ciliate, woolly. Stem rather woody, erect, slightly angular, four feet high, even; racemes terminating.—Native of the high mountains near the Cape.

16. Thesium Triflorum; *Three-flowered Thesium.* Leaves lanceolate; stem angular; peduncles axillary, trichotomous, compound.—Native of the Cape.

17. Thesium Euphorbioides; *Spurge-like Thesium.* Peduncles three-flowered, terminating; leaves subovate, fleshy; branches dichotomous at top. It has the appearance of an Euphorbium.—Native of the Cape.

18. Thesium Colpoon; *Tree Thesium.* Leaves opposite, petioled, obovate, flat, quite entire; corymb terminating, leafless. This tree has compressed ancipital branchlets; racemes from the axils of the branches, erect, compressed, scarcely longer than the leaves.—Native of the Cape.

19. Thesium Spinosum; *Thorny-leaved Thesium.* Leaves awl-shaped, mucronate; flowers axillary, solitary. This is singular in having the leaves spreading, channelled, terminating in a spine.—Native of the Cape.

Thistle. See *Carduus*, and *Serratula.*

Thistle, Blessed. See *Centaurea.*

Thistle, Carline. See *Atractylis, Carlina*, and *Carthamus.*

Thistle, Distaff. See *Atractylis*, and *Carthamus.*

Thistle, Fuller's. See *Dipsacus.*

Thistle, Globe. See *Echinops.*

Thistle Golden. See *Scolymus.*

Thistle, Melon. See *Cactus.*

Thistle, Milk. See *Carduus.*

Thistle, Sow. See *Sonchus.*

Thistle, Star. See *Centaurea.*

Thistle, Torch. See *Cactus.*

Thistle, Woolly. See *Onopordum.*

Thistle, Yellow. See *Argemone.*

Thlaspi; a genus of the class Tetradynamia, order Siliculosa.—Generic Character. *Calix:* perianth four-leaved; leaflets ovate, concave, from erect patulous, deciduous. *Corolla:* four-petalled, cruciform; petals obovate, twice as long as the calix, with narrow claws. *Stamina:* filamenta six, shorter by half than the corolla, of these, two opposite ones are still shorter; antheræ acuminate. *Pistil:* germen roundish, compressed, emarginate; style simple, length of the stamina; stigma obtuse. *Pericarp:* silicle compressed, obcordate, emarginate; style the length of the notch in which it stands, two-celled; partition lanceolate; valves boat-shaped, margined and keeled. *Seeds:* several in each cell, nodding, fastened to the sutures. Essential Character. *Silicle:* emarginate, obcordate, many-seeded; valves boat-shaped, margined, and keeled.—Sow the seeds of these plants where they are to remain, either in spring or autumn, but the latter season is to be preferred. When they come up, thin them where too close, and keep them clean from weeds. If the seeds of any of the sorts be permitted to scatter, they will come up without further care. If the *Campestre* and *Arvense* be cultivated for use, sow them thin upon beds of light ground; hoe and thin them as directed for Carrots, Onions, &c. so as to leave them three or four inches apart.——The species are,

1. Thlaspi Peregrinum; *Foreign Bastard Cress.* Silicles suborbiculate; leaves lanceolate, quite entire. Stems a span high, hard, branched, by age becoming red; flowers small, red, with ovate entire petals. They are produced in loose terminating spikes, appearing in June, and seeding in August.—Native of dry hills in Carniola.

2. Thlaspi Arabicum; *Arabian Bastard Cress.* Silicles oval, styled; lower leaves wedge-shaped, upper cordate-oblong, embracing. Stems herbaceous, diffused, branched, very smooth, as is the whole plant; raceme terminating, with a branch growing out beyond it; flowers small, purple or reddish, at first corymbed, afterwards racemed. This species appears nearly related to the foregoing.—Native of Arabia and Cappadocia.

3. Thlaspi Arvense; *Field Bastard Cress, Penny Cress*, or *Smooth Mithridate Mustard.* Silicles orbicular, compressed, even; leaves oblong, toothed, smooth. Root annual, small, tapering; herb smooth, about a foot or more in height, upright, round, leafy, with seven or eight membranaceous edges, and having a few branches at top; flowers small, in racemes: peduncles alternate, nearly horizontal, one-flowered; petals white, entire, twice the length of the calix. This plant is obviously distinguished by its smoothness, and large flat round pods, from whence it has obtained the name of Penny Cress. The seeds are said to produce twice as much oil as those of Linseed; and have an acrimony approaching to that of Mustard, combined with an unpleasant flavour somewhat like Garlic. The whole plant has the taste of Garlic, so that when cows eat it, their milk acquires an unpleasant taste. It flowers at the beginning of June, and the seeds are ripe by the end of the month; hence they are not liable to be ground with corn, to which in that case they might communicate their ill flavour.—Native of Europe and Japan, in corn-fields, especially in a strong moist soil, and sometimes in gravel. It has been observed in almost all parts of England.

4. Thlaspi Allinoeum; *Garlic Bastard Cress.* Silicles subovate, ventricose; leaves oblong, obtuse, toothed, smooth. Stems few, upright, round, half a foot high, little branched, ending in fruiting racemes as long as themselves; flowers corymbed, small; petals white, scarcely bigger than the calix. Annual.—Native of Austria and Germany.

5. Thlaspi Psychine; *Long-styled Bastard Cress.* Silicle obovate-deltoid, styled; leaves lanceolate-cordate, toothed, embracing, pubescent. Flowers pale yellow, racemed, pedicelled. It flowers early in the spring.—Native of Barbary, near Mayne, on the borders of fields.

6. Thlaspi Saxatile; *Rock Bastard Cress.* Silicles roundish; leaves lanceolate-linear, obtuse, fleshy. Stems annual, trailing, hard, and woody; flowers small, flesh-coloured.—Native of the south of Europe, Germany, Austria, the south of France, and Italy.

7. Thlaspi Hirtum; *Hairy Bastard Cress.* Silicles elliptic-oblong, hairy, undotted, margined above; stem-leaves sagittate, villose. This is distinguished from the Campestre, with which it has been confounded, by having the flowers three times as large, the silicles longer and more hairy.—Native of Italy, the south of France, and of Austria.

8. Thlaspi Campestre; *Wild Bastard Cress,* or *Common Mithridate Mustard.* Silicles roundish, glandular, dotted, margined above; leaves sagittate, toothed, hoary. Root annual, simple; herb more or less pubescent; stems a foot or more in height, upright, round, very slightly angular; flowers very small, and white, in long upright racemes. The seed was formerly celebrated for many virtues, but the present practice pays no attention to it. It is, however, a good attenuant, and operates by urine. The leaves are of a hot, drying, and cleansing nature; the juice of them, externally applied, is a good lotion for old foul ulcers. This, as well as the Arvense, has been used for the same purposes as Mustard seed: it has not so much of the Garlic flavour as the former. There are several varieties, one with smooth broader leaves, not so tapering to a point, and smooth pods. Another variety is soft like velvet to the touch, with the silicles cottony in a slight degree.—This has been observed in Dartmoor.

9. Thlaspi Montanum; *Mountain Bastard Cress.* Silicles obcordate; leaves smooth; root-leaves somewhat fleshy, obovate, quite entire; stem-leaves oblong, embracing, subsagittate; corollas larger than the calix; stem erect, a finger or a hand, seldom a foot, high. The flowers at first form a small umbel, but afterwards are drawn out into a long raceme; calix brownish, with a white margin.—Native of Germany, Austria, the south of France, and Italy, on stony, mountainous situations, flowering in April and May.

10. Thlaspi Alpinum; *Alpine Bastard Cress.* Silicles obcordate; stem-leaves cordate, smooth, quite entire; petals twice as long as the calix; stem simple. This small species is hardly more than four or five inches high. It differs from the next species in the size of the petals, and perennial root, which is slender, ramified, and produces several circles or roses of leaves, and afterwards several stems, which are smooth, simple, of a pale green, and sometimes procumbent; the leaves are alternate, ovate, smooth, and slightly pointed; the flowers are of a moderate size, and milk-white, standing in clusters on the top of each stem.—Native of mountainous situations in the south of Europe.

11. Thlaspi Perfoliatum; *Perfoliate Bastard Cress,* or *Shepherd's Purse.* Silicles obcordate; stem-leaves sagittate-cordate, embracing; stem branched; style very short; root annual, fibrous. It flowers in April and May.—Native of Germany, Switzerland, Austria, the south of France, Italy, and England. Found among the stone-pits between Witney and Burford.

12. Thlaspi Alpestre; *Dwarf Bastard Cress,* or *Shepherd's Purse.* Silicles obovate, retuse, many-seeded; stem-leaves sagittate; stems simple; style stretched out. Root very long, branched, commonly said to be perennial, but it is probably only a biennial.—Native of Germany, Switzerland, Austria, the south of France, Italy, and England. It has been noticed near Settle in Yorkshire, and Matlock in Derbyshire, growing abundantly on the lime-stone rocks, and about the lead-mines. It flowers in June and July.

13. Thlaspi Bursa Pastoris; *Common Shepherd's Purse.* Hirsute: silicles deltoid-obcordate; root-leaves pinnatifid. Root annual, fibrous; stem about a foot high, upright, round, branched, leafy, rough; flowers in corymbs, lengthening out into racemes; petals white, a little longer than the calix, rounded at top. This plant, which grows naturally in most parts of the world, is a strong instance of the influence of soil and situation; sometimes not being more than two or three inches high when it flowers and perfects its seeds, whilst in other situations it attains the height of as many feet. On walls and in dry situations the root-leaves are more deeply divided, and the segments become much narrower; in cultivated ground, they are broader and less jagged; in a barren dry chalk, the plant becomes very small, with a single undivided stem, and the leaves all entire. It is generally found in flower in March and April, yet, like the Groundsel and Poa Annua, may also be found flowering at almost any time of the year. Dr. Withering observes, that this and other species of this genus begin to flower long before they have attained their full size; the flowers at first forming a corymb, which after a while shoots out, and assumes the form of a long spike-like raceme. The stem also, which is at first simple, in time becomes branched; the first branches issuing from its upper part. Small birds are very fond of the seeds. The juice of the leaves is cooling and binding; two spoonfuls of that, with one of red wine, taken frequently, is an excellent medicine for overflowings of the menses, spitting of blood, or other profuse evacuations of that vital fluid: so useful is this common weed, which we every day trample under foot, as if it was possessed of no good qualities.—It is a common weed in every garden, and increases so fast by seeds, that a garden is not easily cleared when they are permitted to shed. There are generally four crops annually from seed; it cannot therefore be too diligently rooted out, which is easily accomplished by hoeing in dry weather. In fallows it is insignificant, and affords food for cattle and sheep.

14. Thlaspi Ceratocarpon; *Siberian Bastard Cress.* Very smooth: stem grooved; leaves sagittate, lanceolate, subserrate; silicles two-lobed; corymbs lengthened into racemes; flowers small, white.—Native of the salt-plains of Siberia.

15. Thlaspi Luteum; *Yellow Sicilian Shepherd's Purse.* Silicle inversely heart-shaped, nearly orbicular; leaves toothed, the lowermost stalked, the rest stem-clasping; style almost equal to the lobes of the seed-vessel. A small, smooth, glaucous, annual plant, from one to three inches high, with yellow flowers.—Native of dry hilly places near Palermo, flowering in April and May.

Thoa; a genus of the class Monœcia, order Polyandria. —Generic Character. *Male Flowers* in spikes. *Calix:* none. *Corolla:* none. *Stamina:* filamenta at the top of each joint in the spike, numerous, short; antheræ very small. *Female Flowers* at the base of the spike, one on each side, sessile. *Calix:* none. *Corolla:* none. *Pistil:* germen ovate; style scarcely any; stigma three or four cleft, very small. *Pericarp:* capsule oblong, brittle, one-celled. *Seed:* one, oblong, in a brittle shell, covered with very small rigid pungent bristles, weaved into a sort of dry aril. Essential Character. *Calix* and *Corolla:* none. *Male. Stamina:* numerous, at the joints of the spike. *Female. Germina:* two, at the base of the male spike, one on each side, sessile. *Stigma:* three or four cleft. *Seed:* in a brittle shell, covered with a bristly web.——The only known species is,

1. Thoa Urens. Leaves opposite, smooth, green, entire, and oval, terminating in a sharp point; the largest are about five inches and a half long, and about three inches wide. The spikes of male flowers spring from the bosoms of the leaves and the tips of the branches; and on each side of the base of the male flowers is a female one, each of which is succeeded by a smooth reddish capsule, under the bark of which is found a dry substance composed of stiff recumbent bristles, which separate easily, and cause a severe itching when rubbed

on the skin. It is a shrub, rising with a tortuous stem to about the length of ten feet, and emitting several twisting and climbing branches upon the neighbouring trees. The bark is rough and grayish, and the wood white and spongy.—Native of Guiana.

Thorn Apple. See *Datura.*

Thorn, Black. See *Prunus.*

Thorn, Box. See *Lycium.*

Thorn, Christ's. See *Rhamnus.*

Thorn, Cockspur. See *Cratægus.*

Thorn, Glastonbury. See *Cratægus.*

Thorn, Goat's. See *Tragacantha.*

Thorn, Haw. See *Cratægus.*

Thorn, Lily. See *Catesbœa.*

Thorn, White. See *Cratægus.*

Thorough Wax. See *Bupleurum.*

Thouinia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* five-leaved, permanent; leaflets roundish, three outer thicker, wrinkled, naked, two inner membranaceous at the edge, silky at the back. *Corolla:* one-petalled, bell-shaped, plaited, twice as long as the calix, five-cleft; the segments very blunt, hispid on the outside, with very frequent rigid fulgid bristles within and along the edge, between the plaits smooth, tomentose, ciliate at the top. *Stamina:* filamenta five, round, naked, twice as long as the corolla, declining; antheræ incumbent, cordate, two-lobed, smooth. *Pistil:* germen ovate, very hairy, superior; style length, form, and situation, of the stamina; stigma simple, obtuse. *Pericarp:* drupe globular, size of a plum, supported by the permanent calix. *Seed:* triangular, somewhat ovate. Essential Character. *Corolla:* one-petalled, bell-shaped, hispid on the outside. *Style:* simple. *Drupe:* coriaceous, of two cells, each two-seeded.——The only known species is,

1. Thouinia Spectabilis. Leaves scattered, obovate-lanceolate, obtuse, very smooth, with a stout midrib, quite entire, often emarginate; petioles short, channelled, when young silky; stipules none; flowers axillary, solitary, large, and handsome, nodding a little, on roundish peduncles, thickened at the top, silky towards the base, having in the middle two small acute, silky, opposite bractes. It is a tree, with a hard wrinkled bark: the branches are round, silky towards the top, terminated by leaves and flowers in bundles. Commerson describes the fruit as a drupe; but Jussieu and Lamarck consider it as a two-celled capsule, with two seeds in each cell.—Native of Madagascar.

Thrift. See *Statice.*

Thrinax; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* spathe universal compound; spadix simply branched, imbricate, with proper spathes in decussated spikes; perianth minute, six-toothed. *Corolla:* none. *Stamina:* filamenta six, short, filiform, inserted into the base of the germen; antheræ large, (larger than the pistil,) erect, bifid at the base and top. *Pistil:* germen half inferior, ovate, surrounded by the calix; style thickish, short; stigma widish, compressed, retuse, emarginate. *Pericarp:* berry one-celled, naked. *Seed:* a single kernel covered with a bony shell. Essential Character. *Calix:* six-toothed. *Corolla:* none. *Stigma:* funnel-form, oblique. *Berry:* one-seeded.——The only known species is,

1. Thrinax Parviflora; *Palmeto Royal,* or *Palmeto Thatch.* Fronds terminating, palmate-plaited, from one to two feet long; divisions lanceolate, nerved, and marked with lines, rigid, almost equal; stipes longer than the leaves, round, flatted, smooth, flexile, unarmed; spadix terminating, almost upright, two or three feet long; panicle branched; branches alternate, subdivided, spreading; branchlets or spikes decussated, opposite, or in threes; flowers pedicelled, opposite, or in threes, placed on the rachis, small, hermaphrodite; berry roundish, the size of a small pea, almost juiceless; kernel white within, red in the middle; trunk from ten to twenty feet high, swelling at the base, unarmed. Browne says, that this tree covers whole fields in many parts of Jamaica; that it grows both in the rocky hills, and low moist plains near the sea, but seems to thrive best in the former. It shoots by a simple stalk, and rises generally from four or five to ten or fourteen feet in height. It is always furnished with leaves in the form of a fan, sustained by slender compressed footstalks; and bears a great abundance of small berries, which serve to feed both the birds and beasts of the woods. The trunk seldom exceeds four or five inches in diameter: and the timber is much used for piles in wharfs and other buildings erected on the sea-shores, as it stands the water well, and is never touched by the worms. The footstalks of the leaves split and pared, serve to make baskets, bow-strings, ropes, &c. where strength and toughness are required. The leaves are called Thatch, and are used especially to cover out-houses. They resist the weather for may years, but are apt to harbour rats and other vermin.

Throatwort. See *Campanula.*

Thryallis; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted; segments lanceolate, erect, permanent. *Corolla:* petals five, roundish, spreading. *Stamina:* filamenta ten, awl-shaped, longer than the calix; antheræ roundish. *Pistil:* germen obtuse; style filiform, length of the stamina; stigma simple. *Pericarp:* capsule three-sided, triangular, obtuse, bipartite; cells opening by the exterior angle. *Seeds:* solitary, very smooth, obovate, obtuse at the base, mucronate, and curved inwards. Essential Character. *Calix:* five-parted. *Petals:* five. *Capsule:* tricoccous.——The only known species is,

1. Thryallis Brasiliensis. Leaves opposite, petioled, ovate, quite entire; stipules bristle-shaped; raceme terminating, from the fork of the branches, simple, a foot long, with very short bristle-shaped bractes, and filiform pedicels, longer than the flowers; flowers small, elegant, yellow; fruits tricoccous or three-grained. It is a little shrub, with round, jointed, reddish branches.—Native of Brazil.

Thuja; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male Flower. Calix:* ament, ovate, composed of a common rachis on which opposite flowers are placed in a triple opposition; each flower has for its base a subovate concave obtuse scale. *Corolla:* none. *Stamina:* filamenta (in each floret) four, scarcely manifest; antheræ as many, fastened to the base of the calicine scale. *Female Flower* on the same plant. *Calix:* strobile common, subovate, surrounded with opposite florets, composed of two-flowered, ovate, convex scales, converging longitudinally. *Corolla:* none. *Pistil:* germen very small; style awl-shaped; stigma simple. *Pericarp:* strobile ovate-oblong, obtuse, opening longitudinally, with oblong scales, almost equal, convex outwardly, obtuse. *Seed:* solitary, oblong, girt longitudinally with a membranaceous wing, emarginate. *Observe.* This genus is very nearly allied to *Cupressus.* Essential Character. *Male. Calix:* scale of an ament. *Corolla:* none. *Stamina:* four. *Female. Calix:* of a strobile, with a two-flowered scale. *Corolla:* none. *Seed:* one, girt with a membranaceous wing.——The species are,

1. Thuja Occidentalis; *American Arbor-Vitæ.* Strobiles smooth, with blunt scales; branches spreading. Trunk strong and woody, rising to the height of forty feet or more. The

bark, while young, is smooth, and of a dark brown colour, but as the tree advances it becomes cracked, and less smooth. The branches are produced irregularly on every side, standing almost horizontal, and the young slender shoots frequently hang down. These branches are not numerous, and the younger ones only have leaves; hence the large trees make but an indifferent appearance, being so thinly clothed with leaves. The flowers are produced from the side of the young branches, pretty near to the footstalk: the males grow in oblong catkins, and between these the females are collected in the form of cones. When the former have shed their farina, they soon drop off; but the latter are succeeded by oblong cones or strobiles, having obtuse smooth scales, containing one or two oblong seeds. This tree generally answers in grounds where the roots can obtain sufficient moisture, and hence it grows tall in swamps and marshes. Stony hills, and places where many stones lie together, covered with mosses, seem to suit it next to the former situations. It seldom fails to grow on hilly sea-shores covered with mossy stones; and is also found upon hills near rivers, and other high grounds, but such places commonly receive their moisture from the upper countries. In very dry places it never attains to any considerable size, though it is pretty frequent in the clefts of mountains, where it cannot grow to any great height or circumference. The tallest of these trees in the woods of Canada, are only from thirty to thirty-six feet high. It is reckoned the most durable of all the timber of Canada, where enclosures of all kinds are seldom made of any other wood, especially the posts which are driven into the ground: the palisades round the forts are made of it, and it furnishes planks or boards for houses. The thin narrow pieces which form the ribs and bottom of the bark-boats, commonly used in Canada, are taken from this tree, because it is pliant enough for the purpose, especially whilst it is fresh, and because it is very light. It is also preferred for the use of the lime-kilns, and the branches are used all over Canada for besoms, which the Indians bring to the town for sale. The fresh branches have a peculiar but agreeable scent, which is perceived very plainly wherever such besoms are used. The wood is of great value for bowls, boxes, cups, mortars, pestles, and various works of the turner and cabinet-maker; hence this tree deserves a place in all plantations, especially as it bears our severest winters, and soon arrives at a middling stature. The Canadians apply the leaves, made into a salve with hogs-lard, to parts affected with rheumatic pains. For violent wandering pains, they use the cones, with four-fifths of Polypody, both powdered coarsely, made into a poultice, with water-milk-warm, and wrapped round the body with a cloth between, to prevent its scorching the skin. The Indians employ a decoction of the leaves in coughs and intermitting fevers. This tree flowers early in the spring, and the seeds are ripe towards the end of September. Where the trees grow thick, they seldom yield seeds, but single trees are always loaded.—Grows in North America, from Canada, to the mountains of Virginia and Carolina; flowering in May.—*Propagation.* This species is generally increased by cuttings, which should be planted in September upon a shady border, and in a loamy soil. The cuttings should be chosen from the shoots of the same year, with a small joint of the former year's wood at the bottom of each. These should be planted three or four inches deep, in proportion to their length, treading the ground close to them, to prevent the admission of air. If the following spring should prove dry, there should be a little mulch laid over the surface of the ground, to prevent its drying: where this is performed in time, it will save the trouble of watering the cuttings, and it will be much better for them, because when they are putting out their young fibres, if they be much watered, that will rot them while they are tender. These cuttings will be rooted enough to transplant by the next autumn, when they may be either planted in beds, or trained up in the rows of the nursery. When they are propagated by layers, the young branches only should be laid down in autumn or March, which will also put out roots by the next autumn; when they may be taken up, and transplanted in the same manner as those raised from cuttings. But although these are very expeditious methods of propagating this valuable tree, those who wish to have large trees should always propagate them by seeds, for the plants so raised will be greatly preferable. There is a variety of this species with variegated leaves, but as the difference proceeds from a weakness in the plants, whenever they become strong and vigorous, the leaves return to their plain colour again; to prevent which, they are generally planted in very poor ground. The variety can only be propagated either by cuttings or layers.

2. Thuja Orientalis; *Chinese Arbor-Vitæ.* Strobiles squarrose, with sharp scales; branches erect. These branches grow closer together, and being much more adorned with leaves, which are of a brighter green colour, make a much better appearance than the former: the branches cross each other at right angles. The cones or strobiles are also much larger, of a beautiful gray colour, and their scales end in acute reflexed points.—Native of China and Japan.—It is generally propagated by layers in the same way as the former; but the cuttings of this, if rightly managed, will take root very freely; but most persons have over-nursed them. If these are planted in September, in a border of soft loam, exposed to the east, and before hard frost sets in, and the surface of the ground covered with old tanners' bark about two inches thick, it will prevent the frost from penetrating the ground very deep; and if this remains in the spring, it will also keep the ground moist; for if these cuttings, or the layers of this sort, are watered in the spring, when they are beginning to put out young fibres, it will certainly rot them. Hence these layers or cuttings ought not to be watered, and should have very little water even when they are transplanted: but as there are many plants now in England which ripen their seeds, so, those who can be supplied with them, should prefer this to both the other methods of propagating the plants; for after the two first years, the seedling plants will greatly outstrip the others in growth, and the plants, growing with their branches closer, will be much handsomer. These seeds should be sown soon after they are ripe, which is in the spring. They should be sown in pots filled with soft loamy earth, and plunged into the ground in an east border, where they may have only the morning sun, observing always to keep the pots clean from weeds. Sometimes these seeds will come up in the same year, but they often lie in the ground till the next spring; therefore the pots should be put in a common hot-bed frame in winter, and in the spring the plants will come up: these must not be too much exposed to the sun in the first year, and if in the next winter they are sheltered under a frame, it will be a good way to preserve them, and in the spring following they may be transplanted into beds, and treated in the same way as those propagated by cuttings. If it be propagated by layers, the plants must stand two years to be rooted. At the beginning of April plant them in penny pots, and plunge them in a moderate hot-bed of tanners' bark, till the beginning of August; after which inure them to the air by degrees, and place them under some protection during the succeeding winter. In these pots let them remain a second year, when they may be

taken out and treated as the first species. They ought not to be planted near, but so as to be protected by other trees. The plants raised either from layers or cuttings, having got sufficient roots, transplant them to a border screened from the mid-day sun, in rows two feet and a half asunder, and one foot in the row; water them at planting, and repeat it once in five or six days in dry weather, and let them remain two years in the same situation: then remove them again, cutting a very little from the ends of the roots. Plant them in rows three feet and a half asunder, and two feet distance in the row, to continue three years, when they will be of a proper size to transplant wherever they are finally to remain. This tree, when large, is as patient of removal as any other evergreen; while young, it is a little more delicate, and slower of growth than the first species, and grows better from seeds than from layers or cuttings.

3. Thuja Articulata; *African Arbor-Vitæ*. Strobiles four-cornered, four-valved; fronds compressed, jointed, leafless. This is a low shrub, growing only from two to six feet high in a dry soil; branches round, alternate, spreading at a right angle. Broussonet asserts, that the resin, commonly called Sandarac, flows from this tree in the neighbourhood of Morocco.—Native of Mount Atlas, and barren hills in Barbary.

4. Thuja Dolabrata; *Japanese Arbor-Vitæ*. Strobiles squarrose; leaves imbricate three ways, beneath excavated and snow-white; branches and branchlets alternate, compressed. It is a very large and lofty tree, and the most elegant of all the evergreens.—Native of Japan: Thunberg observed it every where by the road-side in Fakonia.

Thunbergia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth double: outer two-leaved; leaflets ovate, obtuse, five-nerved, almost the length of the tube: inner one-leafed, many-parted; segments equal, ovate, very obtuse, three times as short as the tube. *Corolla:* one-petalled, bell-shaped; tube dilated upwards; border of five deep obovate segments, half the length of the tube. *Stamina:* filamenta four, inserted into the tube above the base, unequal, the two lower shortest, the two upper shorter than the tube; antheræ ovate, adnate. *Pistil:* germen superior, roundish; style filiform, a little shorter than the tube, erect; stigma two-lobed. *Pericarp:* capsule globular, beaked, smooth, two-celled, opening longitudinally; beak compressed, grooved, linear, obtuse; partition obovate, emarginate, perforated below the top, membranaceous at the sides, permanent. *Seeds:* in each cell two, reniform, wrinkled, convex on one side, concave on the other, with a longitudinal groove. *Observe.* It agrees in many circumstances with the *Barlerias*. The leaflets of the exterior calix are named bractes by Thunberg, from whom this genus has received its name. Essential Character. *Calix:* double; outer two-leaved; inner many-toothed. *Corolla:* bell-shaped. *Capsule:* beaked, two-celled.——The species are,

1. Thunbergia Capensis. Leaves ovate, obtuse; stem diffused. This is a singular plant, which no one would suppose to be different from the Barlerias, if he did not attend to the double calix. Stem four-cornered, hirsute; peduncles length of the leaves or longer, solitary, one-flowered; corolla yellow; capsule smooth, awl-shaped, two-parted.——Native of the Cape.

2. Thunbergia Fragrans. Leaves cordate, acuminate, somewhat angular-toothed at the base; stem scandent. The roots consists of many thick woody fibres; flowers large, of the purest white. This plant, which, Willdenow remarks, has the appearance of Convolvulus Sepium, is common in hedges, among bushes, on the banks of water-courses, about Samulcottah in the East Indies. It flowers during the wet and cold seasons, and, when cultivated, throughout the year. The herb possesses a peculiar and agreeable fragrance; and the beauty of its flowers, though they are not fragrant, entitles it to a place in the flower-garden.

Thymbra; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, subcylindrical, keeled at the sides, two-lipped at the mouth; upper lip wider, half three-cleft, equal, converging; lower narrower, two-parted. *Corolla:* ringent; tube subcylindrical; upper lip flat, straight, half two-cleft, obtuse; lower three-cleft, almost equal, flat. *Stamina:* filamenta four, filiform, approaching by pairs, the two lower ones shorter; antheræ two-lobed; lobes remote, under the upper lip of the corolla. *Pistil:* germen four-cleft; style filiform, half two-cleft; stigmas two, acute. *Pericarp:* none, the calix unchanged. *Seeds:* four. Essential Character. *Calix:* subcylindrical, two-lipped, scored on each side with a villose line. *Style:* semibifid.——The species are,

1. Thymbra Spicata; *Spiked Thymbra*. Flowers spiked; leaves lanceolate. Stem shrubby, very bushy, about a foot high, with numerous, upright, simple, leafy, purplish, quadrangular branches. The stalks are terminated by thick close spikes of purple flowers, nearly two inches long; they appear in June and July, and in warm seasons they are sometimes succeeded by seeds, which ripen in autumn.—Native of Mount Libanus, Macedonia, Spain, and the county of Nice. Sow the seeds in the spring on a bed of light earth, and the plants will appear in six or eight weeks. Keep them clean from weeds, and remove them in July, some into small pots, and others into a warm dry border, shading them from the sun, and supplying them with water till they have taken new root. If the winter should prove very severe, cover the plants in the borders with mats or other covering. The pots should be sheltered under a common frame in winter, where they may enjoy the free air in mild weather, and yet be secured from frost. They will nevertheless endure the winter, unless it be very severe, especially in a poor dry stony soil. They may also be increased by slips and cuttings, planted out in the spring and summer.

2. Thymbra Verticillata; *Whorled Thymbra*. Flowers in whorls; leaves linear-lanceolate. Stalk shrubby, seldom rising much more than a foot high, putting out many small woody branches, which have narrow spear-shaped leaves with many punctures; they stand opposite, and are of an aromatic flavour. The flowers grow in whorled spikes at the end of the branches; they are purple, and sit close to the stalks; the upper lip is concave, and ends with two obtuse points, the lower ends with three equal points. They appear about the same time with the first species, and in warm seasons the seeds ripen in England.—Native of Spain and Italy. Propagated like the first species.

3. Thymbra Ciliata; *Headed Thymbra*. Flowers in heads; leaves linear, ciliate. This is an elegant, upright, and very branching shrub: the younger branches have a very short down upon them; they are round or scarcely four-cornered, simple or branched, unequal; corolla violet; tube straight, twice as long as the corolla; upper lip entire, obtuse, flattish, lower three-lobed; lobes roundish, entire; stamina scarcely longer than the corolla.—Native of Barbary.

Thyme. See *Thymus*.

Thymus; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, half five-cleft into two lips, permanent, having the throat closed with villose hairs; upper lip wider, flat, erect, three-toothed; lower lip two-bristled, of equal length. *Corolla:* one-petalled, ringent; tube length of the calix;

throat small; upper lip shorter, flat, erect, emarginate, obtuse; lower lip longer, spreading, wider, trifid, obtuse; middle segment wider. *Stamina:* filamenta four, curved in, two of which are longer; antheræ small, two-lobed. *Pistil:* germen four-parted; style filiform; stigma bifid, acute. *Pericarp:* none; the calix narrowed at the neck, cherishing the seeds in its bosom. *Seeds:* four, small, roundish. ESSENTIAL CHARACTER. *Calix:* two-lipped, its mouth closed with hair. *Corolla:* upper lip flat, emarginate.——The species are,

1. Thymus Serpyllum; *Wild Thyme.* Flowers in heads; stems decumbent; leaves flat, ovate, obtuse. Root woody, fibrous, brown, perennial; heads of flowers terminating, roundish, with little leaves among them; calix striated or ribbed, dotted like the leaves; the two lower teeth deeply gashed, narrower, acute, ciliate; the mouth close, with white converging villose hairs: according to Withering, it is coloured, with a circle of white hairs running round the inside at the base of the segments, which, while the plant is in flower, lie flat to the sides of the calix, but, when the corolla falls off, expand and close up its mouth: corolla purplish-red; the upper lip erect, and turning back a little; lower divided into three obtuse segments, the middle one longest.—Few plants are subject to more varieties than this species. In its most natural state, on dry exposed downs, it is small and procumbent; but when it grows among furze or other plants, it runs up with a slender stalk to a foot or more in height. It differs also very much in the smoothness or hairiness of its leaves: the flowers are sometimes larger than ordinary, and of a paler purple colour, or even white.—The White-flowered, the Large-flowered, and the Broad-leaved Wild Thyme, are not uncommon. The last was observed at Okey-hole in Somersetshire; and is described by Miller, with leaves broader and smoother than those of the common sort; stalks growing much longer; joints farther distant; heads of flowers larger; and corolla of a brighter purple colour. There is a variety of it with variegated leaves, which was formerly planted for edgings to borders, and is frequently brought in pots to the London markets. Another variety, called Lemon Thyme, is generally kept in gardens, for the agreeable odour of its leaves; but when it is propagated by seeds, the plants have not the same scent: it is therefore an accidental variety, which can only be preserved by slips or cuttings: it is found wild in Kent, and at Downton Castle, Shropshire. The Narrow-leaved Smooth Wild Thyme is known by its leaves, which the name itself describes, and which smell like those of the Walnut Tree. The Hoary Wild Thyme differs only from the common sort by its hairiness. Ray found it on Gogmagog Hills, and it still occurs there and in other barren places. The small scentless creeping Wild Thyme was imported from Ireland. The Shrubby Hairy Mother of Thyme, or Wild Thyme, was found near Llanberys; and by Sherard on Snowden, in North Wales. Linneus mentions another variety, with woolly heads, which are the nests of some insect. It is not uncommon in England; and is not singular in being thus infested by insects, as Veronica, Chamædrys, Glecoma, Hederacea, Valeriana, Locusta, and other plants, are frequently distorted from a similar cause.—The whole plant of this species, and most of its varieties, is fragrant, and yields an essential oil that is very heating. An infusion of the leaves removes the headache occasioned by a debauch; but abstaining from excess is a far more effectual and salutary prescription. It has the same sensible qualities as Garden Thyme, but the flavour is milder, and rather more grateful: the essential oil is obtained in smaller quantity, and is less acrid, and its spirituous extract comes greatly short of the penetrating warmth and pungency of the garden kind. The partiality of bees for this and other aromatic plants is well known; and it is a common notion, that the flesh of sheep, feeding upon such plants, becomes superior in flavour to other mutton. The fact, however, is, that sheep do not crop these aromatic plants, except by accident, or when they are turned half famished upon downs, heaths, or commons; but the soils and situations favourable to aromatic plants produce a short sweet pasturage, best adapted to feeding sheep, whom nature designed for mountains, and not for turnip-grounds or rich meadows.—*Propagation and Culture.* This plant is propagated either by seeds or by parting the roots; the season for which is either in March or October. If it be propagated by seeds, they should be sown early in the spring, upon a bed of light earth, observing not to bury the seeds too deep, as that would cause them to rot; nor ought they to be sown too thick, for the seeds are very small. When the plants are come up, they should be carefully cleaned from weeds; and if the spring should prove dry, and they are watered twice a week, it will greatly promote their growth. In June the plants should be thinned, leaving them about six inches asunder each way, that they may have room to spread; and those plants which are drawn out may be transplanted into fresh beds at the same distance, observing to water them until they have taken root; after which they will require no further care but to keep them clear from weeds, and in the winter following they may be drawn up for use. But if the plants be propagated by parting their roots, the old plants should be taken up at the times before mentioned, and slipped into as many parts as can be taken off the root; these should be transplanted into fresh light earth, at six or eight inches' distance, observing, if the season be dry, to water them until they have taken root, after which they must be duly weeded; and will thus thrive so as to be soon fit for use. In order to save the seeds of these plants, some of the old roots should remain unmoved in the place where they were sown the preceding year; these will flower in June, and in July the seeds will ripen; it must be taken as soon as ripe, and beat out, or the very first rain will wash it all out of the husks. These plants root greatly in the ground, and soon extract the goodness of the soil; hence whatever is sown or planted upon a spot of ground whereon Thyme grew in the preceding year, will seldom thrive, unless the ground be first trenched deeper than the Thyme was rooted, and well dunged. If Thyme grow upon walls, or on dry poor stony land, it will survive the severest cold of this country.

2. Thymus Lanuginosus; *Woolly Wild Thyme.* Flowers in heads; stems creeping, hirsute; leaves obtuse, villose. Linneus considers this as a variety of the preceding; but Willdenow observed, that culture does not make any alteration. Miller describes it as having trailing slender stalks, with small ovate-lanceolate hoary leaves, and the young shoots of the same year very white and hoary. The leaves are stiffer than those of the other sorts; and the flowers, which are in round terminating heads, of a bright purple colour.—Found on the rocks of Germany, and France. Miller says, it grows naturally in the forest of Fontainbleau.

3. Thymus Lævigatus; *Smooth Arabian Thyme.* Flowers in heads; stems procumbent; leaves linear, obtuse, sessile, narrowed at the base; corolla somewhat hairy; stamina longer than the corolla.—Native of Arabia Felix, on Mount Chadra.

4. Thymus Vulgaris; *Common Garden Thyme.* Flowers whorl-spiked; stems erect; leaves ovate, rolled back. This is distinguished from Wild Thyme, by being more hoary, higher, harder, and more woody; the leaves are also whiter and narrower, and the flowers smaller. There are several varieties; as, the Narrow-leaved, the Broad-leaved, and the

Hoary Garden Thyme. Miller treats of the two former, as distinct species. The narrow-leaved has shorter stalks, longer and narrower leaves, ending in sharper points, with the entire plant hoary; the flowers growing in long whorled spikes, and larger than those of the common sort. Tournefort describes two other varieties; one very hoary, the other with the heads much smaller. This herb has an agreeable aromatic smell, and a warm pungent taste. Bergius observes, its qualities are resolvent, emmenagogue, diuretic, tonic, and stomachic; its aromatic qualities indicate, that it may be useful in those complaints in which Lavender, Sage, Rosemary, and other verticillatæ, are employed. It yields a species of Camphor in distillation with water. For many ages it has been cultivated in Great Britain, especially before the introduction of Oriental Spices, when it and other aromatic herbs were much used in cookery; the Spaniards still infuse it in the pickle with which they preserve their Olives.—Found on stony hills in Spain, Portugal, the south of France, Greece, and the Archipelago. It is propagated in the same way as the first species.

5. Thymus Lanceolatus; *Lance-leaved Thyme.* Flowers whorl-spiked; stem suffruticose, erect; leaves oblong, flat, pubescent; bractes lanceolate, longer than the flower, quite entire; corolla purple, glandular, longer than the calix, the same size as in the preceding species.—Native of Mount Atlas about Tlemsen, flowering in the spring.

6. Thymus Numidicus; *Barbary Thyme.* Flowers in heads; calices hirsute; bractes ovate-lanceolate, ciliate; stem fruticulose, erect; leaves linear, patulous, smooth. This is a branching shrub, four inches high: branches slender, erect, pubescent at the upper part; corolla small, rose-coloured.—Native of Barbary, near La Calle.

7. Thymus Zygis; *Linear-leaved Thyme.* Flowers whorl-spiked; stem suffruticose, erect; leaves linear, very blunt, nerveless, rolled back at the edge, ciliate at the base; branches many, recurved before flowering; corolla white. It varies with hairy leaves, and has the appearance of Common Garden Thyme. It flowers in August. Native of Spain.—This, and the 16th, 17th, 19th, and 20th species, may be increased by slips planted in April on an eastern border, and closely covered with a bell or hand glass, refreshing them moderately twice a week with water. When they have put out good roots, transplant some into pots, to be sheltered under a frame in winter, and plant the rest on a warm border of dry ground, observing to shade and water them until they have taken new root: in severe frost the latter will generally be destroyed. They may also be propagated by seeds, sown on a bed of light earth, in the same way as Common Marjoram. Most of the other species may be increased by slips or parting the roots, or by seed sown in the spring. They delight in dry undunged ground, where some of them will increase by trailing their stalks.

8. Thymus Marschallianus; *Marshall's Thyme.* Flowers whorl-spiked; stem suffruticose, erect; leaves linear-lanceolate, bluntish, flat, obscurely triple-nerved, ciliate at the base; upper floral-leaves like those of the stem, but shorter, and three-nerved; calices rough-haired, striated; corollas longer than the calix. It varies with leaves narrower by half, and is not like the preceding even in its habit.—Found in Tauria.

9. Thymus Inodorus; *Scentless Thyme.* Stem shrubby, very much branched; leaves needle-form, bundled, shorter than the flower. This is a very branching upright shrub; branches approximating; bark on the older branches cloven; flowers in whorls, axillary, pedicelled, longer than the leaf, numerous; corolla purple, longer than the calix.—Native of dry barren hills near Algiers.

10. Thymus Acinus; *Basil Thyme.* Whorls six-flowered; peduncles simple; stem herbaceous, ascending, branched; leaves acute, serrate; calix gibbous at the base. Root annual, simple, fibrous; each flower on a pedicel, various in length; calix swelling at the base, on the lower side deeply grooved, the prominent ribs fringed with bristly hairs; upper lip erect, with three broadish nearly equal segments, lower projecting into two narrow sharp ones; mouth fringed with white hairs, which, pointing inwards, completely close it when the corolla is fallen; corolla purple; tube dilated upwards; upper lip shorter, blunt, turned back, slightly notched; lower of three roundish segments, the middle one longer, obcordate, marked at the base with a raised white semilunar spot, and a spot or two of darker purple. This species has a pleasant aromatic smell, but not so strong as that of the first species, to which indeed it bears little resemblance, being much like the twelfth species; the flowers of which are however nearly twice as large, and the swelling at the base of the calix is not so considerable.—Native of Europe, in dry hilly fields, especially in a calcareous soil, flowering in July and August. It occurs about Charlton, Dartford, and other parts of Kent; not unfrequently in Surry and Norfolk; on Gogmagog hills, and Newmarket heath, in Cambridgeshire; on Barton hill, and near Aspley, in Bedfordshire; at Headington wick, Stonesfield, and South Leigh in Oxfordshire; on St. Vincent's rocks, near Bristol; and in Yorkshire.

11. Thymus Patavinus; *Great-flowered Thyme.* Flowers in whorls; throat inflated, longer than the calix; leaves ovate, serrate; stems suffruticose, many in number, arising from a perennial fibrous root, from a palm to a foot in height, ascending, pubescent, branched; corolla pale red. Willdenow observes, that it seems to be very nearly allied to the next species.—It flowers here from June to August, and is supposed to be a native of the south of Europe and Hungary: it was found by Desfontaines near Mascar in Barbary.

12. Thymus Alpinus; *Alpine Thyme.* Whorls six-flowered; leaves roundish, bluntish, concave, serrate; corollas inflated. This is nearly allied to the tenth species: Villars says, it differs from it in having larger, greener, and less hard leaves; stems lower and less branched; flowers twice as large, with the calix coloured, not gibbous. The same author adds, that it has an aromatic odour, with an agreeable acid approaching to that of lemon, in which, as well as in its character, it approaches nearer to the Calamints and Melissa than to Serpyllum. Accordingly Scopoli has united them, and Dr. Smith has united the Calamints to this genus. It flowers from June to September.—Native of the south of France, Austria, Italy, &c.

13. Thymus Montana; *Mountain Thyme.* Flowers in whorls; peduncles one-flowered; stem erect, branched; leaves ovate, quite entire; calices smooth. Allioni says, this constantly preserved its hairiness, the size of its leaves, and its peculiar habit, for many years under cultivation.—Native of the Carpathian mountains, the Valais, &c.

14. Thymus Piperella; *Pepper Thyme.* Peduncles many-flowered, lateral; leaves ovate, obtuse, smooth, nerved, quite entire. Stem almost decumbent, round, simple, or little branched, the first branches opposite, the rest alternate. The stems and branchlets begin to flower about the middle: from each axil issues a short peduncle, supporting three or five flowers, the two lower of which flower later, the middle one earlier; without any bractes, and on a longer peduncle; corolla purple; tube twice as long as the calix; upper lip erect, cordate, roundly emarginate; lower trifid, the lateral segments ovate, the middle one wider, emarginate. Vahl remarks, that he has observed numerous individuals of this species in

some places scarcely a finger's length and decumbent, with the leaves in clusters, and fewer flowers in the axils; but for the most part half a foot high, with many-flowered peduncles. —Native of Spain, Barbary, and Arabia.

15. Thymus Brownei; *Jamaica Thyme.* Leaves orbicular, crenate; flowers peduncled, axillary, many, solitary, acute, on a very short peduncle; upper lip of the corolla slightly bifid, erect; middle segment of the lower larger, cordate. Stem herbaceous, procumbent.—Native of Jamaica.

16. Thymus Filiformis; *Small-leaved Thyme.* Flowers axillary, solitary, peduncled; leaves cordate, acute, quite entire, petioled; stems filiform, decumbent. It flowers in June and July.—Native of the Balearic Islands, Majorca, Minorca, and Yvica. See the 7th species.

17. Thymus Cephalotus; *Great-headed Thyme.* Heads loosely imbricate; bractes broad-ovate, coloured, undotted; leaves linear, quite entire. Stem low and woody, from which come out many stiff branches five or six inches long. The corolla is white and very small. The whole plant is hoary, with a weak aromatic scent. Tournefort distinguishes three varieties of this species: one with very white braces; a second with larger heads; and a third with smaller.—Native of Spain and Portugal. See the 7th species.

18. Thymus Striatus; *Striated Thyme.* Heads closely imbricate; bractes ovate; leaves linear-lanceolate, striated, dotted at the edge. This species differs from the preceding in having shorter and stiffer stems, not branched at top; wider upright leaves striated beneath, serrate, dotted only at the edge; the heads smaller, closely imbricate; the bractes striated, smaller, dotted.—Native of Naples.

19. Thymus Villosus; *Hairy Thyme.* Heads imbricate, large; bractes toothed; leaves bristle-shaped, hairy; stems trailing. Roots woody, sending out numerous branched shrubby stems, which compose ample tufts, taking root as they spread, with short, simple, ascending flowering branches. The bractes and calix are tinged with a violet purple; and the corolla is rose-coloured, with a slender hairy tube.—Native of Portugal. See the 7th species.

20. Thymus Mastichina; *Mastick Thyme.* Flowers in whorls; calices lanuginose; tooth of the calix setaceous, villose. This shrub is a foot in height; the leaves are heaped on the stem, linear or even, ovate, the lower hoary beneath, the upper ones smooth; flowers small, white, conspicuous for the long slender teeth of the calix, which are pectinated with abundance of long bristly hairs. The odour of the plant is pleasantly aromatic: it is somewhat tender, and requires protection in winter.—Native of stony ground in Spain and Greece. See the 7th species.

21. Thymus Tragoriganum; *Goat's Thyme.* Flowers in whorls; stem suffruticose, erect; leaves hispid, acuminate. This is a sweet-smelling shrub.—Native of Candia.

22. Thymus Virginicus; *Virginian* or *Savory Thyme.* Heads terminating; stem erect; leaves lanceolate. Root perennial; stalk annual, rising about a foot and half high, stiff, angular, branching out towards the top; flowers white, collected into globular heads, appearing in July, but seldom ripening seed in England.—Native of North America.

Tiarella; a genus of the class Decandria, order Digynia. —Generic Character. *Calix:* perianth one-leafed, five-parted; segments ovate, acute, permanent. *Corolla:* petals five, oblong, permanent, entire, inserted into the calix. *Stamina:* filamenta ten, capillary, longer than the corolla, inserted into the calix; antheræ roundish. *Pistil:* germen bifid, ending in two very short styles; stigmas simple. *Pericarp:* capsule oblong, one-celled, two-valved; valves flattish, one twice as long as the other. *Seeds:* numerous, ovate, shining. Essential Character. *Calix:* five-parted. *Corolla:* five-petalled, inserted into the calix; petals entire. *Capsule:* one-celled, two-valved, with one valve larger.——The species are,

1. Tiarella Cordifolia; *Heart-leaved Tiarella.* Leaves cordate, acutely lobed, with pointed teeth; cluster simple, ovate. Root perennial, creeping, fibrous; flower-stalks slender, naked, about four inches long, arising also from the root between the leaves, and terminated by a simple downy cluster of small herbaceous white flowers, which appear in May, but are seldom followed by seeds in England.—Native of North America, and of the northern part of Asia. This, and the next species, are propagated by parting their roots, which spread in the ground and shoot up heads, which may be taken off and transplanted in the autumn. They love a moist soil and a shady situation, and require no other care but to keep them clean from weeds.

2. Tiarella Trifoliata; *Three-leaved Tiarella.* Leaves ternate, lobed and toothed; stem leafy; cluster compound. Root perennial, fibrous; from which spring up a few trifoliate petioled leaves, like those of the Bilberry, but much smaller. The stalk is slender, and rises five or six inches high; it is rough and hairy, has two leaves at the bottom, and one towards the top, and is terminated by a cluster of small greenish-white flowers, which appear early in May; but the plants rarely produce any seeds in England.—Native of the northern parts of Asia.

3. Tiarella Menziesii; *Slender-spiked Tiarella.* Leaves ovate, cordate, acute, short-lobate, dentated; stem-leaves alternate, distant; raceme filiform, subspicate; calices tubulose. This plant rises to the height of more than a foot, and has five or six alternate leaves on the stem.—A native of the north-west coast of North America.

4. Tiarella Biternata. Leaves biternate; leaflets ovate-cordate, oblique, inciso-lobate, dentate; stem leafy; panicle terminal, divaricate-spiciflorous; flowers yellowish-white.— Grows on the mountains of South Carolina. The specimens Mr. Pursh had the opportunity of examining were destitute of petals, though they are distinctly described by Ventenat. It is, however, probable, Pursh further observes, that some individuals may be petaliferous, while others are apetalous.

Tickseed. See *Corispermum.*

Tickseed Sunflower. See *Coreopsis.*

Tigarea; a genus of the class Icosandria, order Monogynia.—Generic Character. *Calix:* very rough on the outside, with acute segments. *Stamina:* filamenta about thirty, of the length of the petals; antheræ oblong, biloculars. *Pistil:* germen oblong, rough, of the length of the stamina; style short, oblique; stigma simple. *Pericarp:* capsule folliculiform, with a gaping lateral suture. *Seed:* single. Essential Character. *Calix:* beneath campanulate, five-parted. *Petals:* five. *Capsule:* folliculiform, gaping with a lateral suture.——There is only one species, viz.

1. Tigarea Tridentata. Leaves at the top of the branches heaped together, obcuneate, tridentate, villose above, canotomentose underneath; flowers yellow, terminal, solitary, with very short peduncles.—Grows in the prairies of the Rocky mountains, and on the Columbia river, flowering in July.

Tilia; a genus of the class Polyandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, five-parted; segments concave, coloured, almost the size of the corolla, deciduous. *Corolla:* petals five, oblong, obtuse, crenate at the tip. *Stamina:* filamenta thirty and more, awl-shaped, length of the corolla; antheræ of two nearly orbicular lobes, bursting outwards. *Pistil:* germen roundish; style fili-

form, length of the stamina; stigma blunt, pentagon. *Pericarp:* capsule coriaceous, globular, five-celled, five-valved, opening at the base. *Seeds:* solitary, roundish. *Observe.* One seed commonly comes to maturity, and drives the other abortive ones to one side; hence, to a cursory observer, the capsule appears to be one-celled. ESSENTIAL CHARACTER. *Calix:* five-parted. *Corolla:* five-petalled. *Capsule:* coriaceous, globular, five-celled, five-valved, opening at the base. ——The species are,

1. Tilia Europæa; *European Lime Tree.* Flowers destitute of a nectary; leaves cordate at the branches of the veins, villose underneath. A tall upright tree, with smooth, spreading, round branches, green when tender, but afterwards brown. The flowers are delightfully fragrant, especially at night; petals yellowish, obtuse, concave. It is remarkable, says Gærtner, that the cotyledons of the Lime-tree are subtrilobate and toothed; and it is peculiar to it, as far as we know, that these are already toothed whilst they are lying within the coats of the seed.—Mr. Miller makes two species of this tree: the *Cordata*, which is the small-leaved one, wild in England; and the *Europæa*, to which he gives Ray's synonym of the Red-twigged Lime-tree. Of the first he observes, there are two or three varieties, which differ in the size and smoothness of the leaves, some having much larger and rougher leaves than others: but they vary from one to the other when raised from seed; and it is even doubtful whether the second be more than a seminal variety. Scopoli also, following Haller, distinguished the large and small-leaved varieties. The former, he says, not only has the leaves larger, but softer, and somewhat hairy or villose; in the latter they are harder, and nowhere villose, besides flowering two or three weeks later. The Elm-leaved variety was observed at Whitstable, and near Dorking in Surry; and the Red-twigged in Stokenchurch wood. In Ray's *Synopsis*, three varieties are remarked in St. James's Park: 1. The Small Smooth-leaved. 2. The Large Smooth-leaved. 3. The Softly Hairy-leaved. Two others have been observed, one with striped leaves; and the other on Enfield chase, with wrinkled, but not hairy leaves.—This tree was highly esteemed by the Romans for its shade, and for the numerous purposes for which it serves. "*Tiliæ ad mille usus petendæ.*" "The Limes demanded for a thousand uses," is a phrase very indicative of the value in which it was held by that renowned and scientific people; and, as Gough remarks, it certainly is a handsome tree, having a smooth taper straight trunk, and the branches forming a beautiful cone; the foliage also is smooth and elegant. It makes a fine detached object, planted singly in parks and open lawns. The branches are so tough as to be seldom broken by the winds; and when they are injured no tree heals sooner; and to all this, the fragrancy of the flowers, which are continually haunted by bees, forms an important addition. It will continue growing, and remain sound, for a great number of years, and grows to a considerable bulk in a good loamy soil. One tree that was measured, was nearly ten yards in girth two feet above the ground, and was then in a thriving condition. Another, at Depham in Norfolk, was sixteen yards in compass at half a yard from the ground; and in the least part of the trunk, almost eight yards and a half: it was thirty yards in height. In Lincolnshire this tree is called *Bast*, because they make ropes of the bark. This is done by maceration, separating the bark into thin layers, such as are used for making the Russia or Bast mats, so much used by gardeners. This quality in the bark, and the great degree of viscidity in the whole tree, evince its acknowledged affinity to the Mallow tribe. Lime-tree wood is turned into light bowls and dishes, and into boxes for the apothecaries. Baskets and cradles are made with the twigs. The bark was formerly used for writing-tablets. Shoemakers make dressers of the plank, whereon to cut their leather. The truncheons make a far better coal for gunpowder than Alder itself, as well as scriblets for painters' first draughts. The wood is soft, light, and smooth, close-grained, and not subject to the worm. The most elegant use to which it is applied is for carving. Many of Gibbon's beautiful works in Lime-tree are dispersed about the kingdom, in our churches and palaces; as, in the choir of St. Paul's cathedral; at Chatsworth, a seat of the duke of Devonshire; and at Trinity College Library, Cambridge. The inspissated sap of this tree yields a quantity of sugar; and Mr. Boutcher observes, that the timber is stronger and lighter than any sort of Willow, and makes a proper sort of lining for rooms, which, when well painted, is very durable. The small-leaved variety is found really wild in many parts of England, in woods, and upon grassy declivities. The Common Broad-leaved and other varieties are more generally seen cultivated in hedges, avenues, parks, and before houses.—The Lime will bear the smoke of London itself tolerably well; and the trees in St. James's Park, which were planted in the reign of Charles II. at the suggestion of the excellent Evelyn, in order to improve the air near the royal residence, afford ample proof of the fact. The Dutch plant vast numbers of this tree by the side of their canals; hence, during the months of July and August, when the stagnant waters would be very disagreeable and unwholesome, the air is purified, and the whole country regaled, by the perfume of their fragrant flowers.—*Propagation and Culture.* This very valuable tree will grow in almost any soil and situation; but in thin soils the leaves are often infested with insects, and fall early in autumn, especially in dry seasons. It is easily propagated by layers, which in one year will take good root, and may then be taken off, and planted in a nursery, at four feet distance row from row, and two feet asunder in the rows. The best time to lay them down, and to remove them, is at Michaelmas, or soon after, when their leaves begin to fall, that they may take root before the frost comes on, though they may be laid and transplanted any time from September to March in open weather; but if the soil be dry, it is much the better way to remove them in autumn, because it will save a great expense in watering them, especially if the spring should prove dry. In this nursery they may remain four or five years, during which the ground should be dug every spring, and constantly kept clean from weeds, and the large side-shoots pruned off, to cause them to advance in height; but the small twigs must not be pruned off from the stems, because they are absolutely necessary to detain the sap for the augmentation of their trunks, which are apt to shoot up too slender when entirely divested of their lateral twigs. If the soil in which these are planted be a fat loam, they will make a prodigious progress in their growth; so that in three years' time they will be fit to transplant out where they are to remain. The Lime-tree may be propagated by cuttings, but as that method is not so certain as by layers, the latter is generally preferred. In order to obtain proper shoots for laying down, a tree is cut down close to the ground, from the roots of which a number of strong shoots are produced in the following year: these will be strong enough to lay down in the succeeding autumn, especially if the smallest of them be cut off close early in the summer; for when too many shoots are suffered to grow all the summer, they will be much weaker than if only a sufficient quantity were left. There are some persons who raise these trees from seeds, which, though a slower way, is the best method when

the trees are designed to grow large; and if they be only once transplanted while young, it will be better still: for all trees that are transplanted when large, are shorter-lived than those which remain in the places where they arose from seeds, and their timber will be sounder, and grow to a much larger size. The seeds should be sown in autumn, soon after they are ripe, upon a shady border of moist light soil, where the plants will come up in the following spring; but when the seeds are kept out of the ground till spring, the plants will not come up till the year after. When they appear, keep them clean from weeds till the following autumn, and then take them up carefully, and transplant them into a nursery, where they may grow two or three years to get strength, and then may be planted where they are intended to remain. Mr. Boutcher recommends the seeds to be gathered at the end of October, when they are ripe, and, after being quite dry, to mix them with sand to protect them from frost and rain, and to sow them at the beginning of March. Dr. Hunter directs the seeds to be sown in beds three feet and a half or four feet wide, about an inch asunder, covering them three-quarters of an inch, or an inch deep. They will appear in the spring, must be weeded and slightly watered in very dry weather, and have ashes sifted over them before winter to destroy the moss. In two years they will be fit to plant out in the nursery in rows two feet and a half asunder, and each tree at eighteen inches' distance, shortening the roots a little, and cutting off any side-branches. They will bear removing at any size, though the younger when transplanted the better.

2. Tilia Americana; *Broad-leaved American Lime Tree.* Flowers furnished with nectaries; leaves deeply cordate, sharply serrate, smooth. This was brought from New England under the name of *Black Lime*, the branches being covered with a dark brown bark. The petals are narrower, and have nectaria growing to their base. The flowers do not appear till late in July, a full month after the common sort; and the capsules are smaller, rounder, and less hairy. —Native of Virginia and Canada.

3. Tilia Pubescens; *Hoary Lime Tree.* Flowers furnished with nectaries; leaves truncate at the base, oblique, toothlet-serrate, pubescent underneath; panicles forked, compound. This seems to be a smaller tree than either of the former; the branches spread more horizontally: the bunches of flowers stand upon long slender footstalks; and the flowers emit a very fragrant odour, and are frequented incessantly by bees while they continue: they come out in July, and ripen seed in favourable autumns.—Brought from Carolina at the beginning of the seventeenth century.

4. Tilia Alba; *White Lime Tree.* Leaves deeply cordate, subsinuate, toothed, tomentose underneath. A hardy tree, but does not flourish so well in England as any of the preceding.—Native of woods in Hungary.

5. Tilia Laxiflora; *Panicled Lime Tree.* Leaves cordate, sensibly acuminate, membranaceous, glabrous; panicles laxiflorous; petals emarginate; style longer the petals; capsule globose.—Grows near the sea-coast from Maryland to Georgia: flowering in May and June.

6. Tilia Heterophylla; *Various-leaved Lime Tree.* Leaves ovate at the base, obliquely or equally truncated and cordated, finely serrated; snowy and tomentose beneath; capsule globose, subcostate.—A very handsome and desirable ornamental tree, growing on the banks of the Ohio and Mississippi.

Tillæa; a genus of the class Tetrandria, order Tetragynia. —Generic Character. *Calix:* perianth four-parted, flat; segments ovate, large. *Corolla:* petals four, ovate, acute, flat, commonly smaller than the calix. *Stamina:* filamenta four, simple, shorter than the corolla; antheræ small, roundish. *Pistil:* germina four; styles simple; stigmas obtuse. *Pericarp:* capsules four, oblong, acuminate, reflexed, length of the calix, opening longitudinally upwards. *Seeds:* in pairs, ovate. *Observe.* In the eighth species the parts of fructification are usually in threes, not fours. Essential Character. *Calix:* three or four parted. *Petals:* three or four, equal. *Capsules:* three or four, many-seeded.——The species are,

1. Tillæa Aquatica; *Water Tillæa.* Stem upright; leaves linear; flowers sessile, generally four-cleft and four-stamined. Annual. A delicate smooth plant, two or three inches high. —Native of Lapland, and very abundant near Upsal, where water stagnates upon the mountains.

2. Tillæa Prostrata; *Prostrate Tillæa.* Stem prostrate; leaves lanceolate; flowers peduncled; peduncles shorter than the leaf. Annual.—Native of moist places in Germany.

8. Tillæa Vaillantii; *Vaillant's Tillæa.* Stem upright, dichotomous; leaves ovate, stem-clasping, shorter than the peduncles.—Native of France, in moist places.

4. Tillæa Capensis; *Cape Tillæa.* Leaves somewhat oblong; flowers four-cleft; roots capillary, abundant; stem an inch in height, herbaceous, dichotomous; petals four, oval, white, twice as long as the calix; nectaries purple, triangular.—This, and the following, are natives of the Cape.

5. Tillæa Perfoliata; *Perfoliate Tillæa.* Leaves perfoliate, ovate; corymbs terminating; flowers four-cleft.

6. Tillæa Umbellata; *Umbelled Tillæa.* Leaves subpetioled, obtuse, entire; stem capillary, upright; flowers umbelled.

7. Tillæa Decumbens; *Decumbent Tillæa.* Decumbent: leaves awl-shaped; petals shorter than the calix.

8. Tillæa Muscosa; *Mossy Tillæa.* Stems procumbent, branched; leaves obtuse; flowers sessile, mostly trifid; calix and petals taper-pointed. Root annual, small, fibrous; herb succulent, smooth, generally red; stems numerous, filiform, round, becoming quadrangular when dry, jointed, one or two inches high, but lengthening considerably after flowering, at first nearly erect, but after a while procumbent.—The most dreary sands are not always unprofitable to a botanist; their loose and fluctuating surface being often arrested for a while, and destined to afford support to a tribe of plants, the constitution of which is fitted by Providence to thrive on the meagre nourishment which they afford. Thus some of the vast African deserts are turned to account by means of Mesembryanthemum, Cotyledon, and other succulent vegetables; and here we have a plant nearly allied to the latter genus, which flourishes on the driest sandy heaths, where few others would live, and at a season when Mosses and Lichens are dried up. Large tracts of such land, as Grayton, Cawston, and Mousehold heath, in the county of Norfolk, and Brandon heath in Suffolk, are enlivened by the red colour of this remarkable plant.

Tillandsia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, trifid, oblong, erect, permanent; segments oblong-lanceolate, acuminate. *Corolla:* tubular, one-petalled; tube long, ventricose; border trifid, obtuse, erect, small. *Stamina:* filamenta six, linear, as long as the tube of the corolla; antheræ acute, in the neck of the corolla, incumbent. *Pistil:* germen oblong, acuminate both ways; style filiform, length of the stamina; stigma trifid, obtuse. *Pericarp:* capsule long, obtusely three-cornered, acuminate, one or two celled, three-valved. *Seeds:* many, cylindrical, fastened to a very long capillary pappus. Essential Character. *Calix:* trifid, permanent. *Corolla:* tubular, trifid. *Capsule:* three-valved. *Seeds:* comose.——The species are,

1. Tillandsia Utriculata; *Bottle Tillandsia*, or *Wild Pine.* culm panicled. Many brown fibrils from the roots encompass the arms, or take firm hold on the bark of the trunk of trees; not like Mistletoe, entering the bark or wood to suck nourishment, but only weaving and matting themselves among one another, and thereby making to the plant a strong and firm foundation, whence rise several leaves on every side, like those of Aloes or Ananas; hence it is called *Wild Pine.* These leaves are folded or inclosed one within another, each three feet and a half long, and three inches broad at the base, but ending in a point, having a very hollow or concave inward side, and a round or convex outside, forming a basin or cistern containing about a quart of water, which in the rainy season falls upon the upper parts of the spreading leaves, and, being conveyed down them by channels, lodges in the bottom as in a bottle; for the leaves, having swelled out at the base, bend inwards close to the stalk, thus hindering the evaporation of the water by the heat of the sun. From the midst of the leaves rises a smooth, round, straight, green stalk, three or four feet high, having many white branches, and, when wounded, yielding a clear white mucilaginous gum. The flowers come out here and there on the branches: the corolla is of a yellowish-white or herbaceous colour; and the calix is made up of three green viscid leaves with purple edges: capsule greenish-brown, having under it three short capsular leaves, and within several long pappose seeds, which are oblong, pyramidal, very small, and have a very soft down as long as the capsule itself. By this down the seed is not only carried with the wind, but adheres also to the bark of trees, where, as soon as it sprouts, although it be on the under part of the bough, it rises perpendicularly; for if it had any other position, the cistern could not hold the water which is necessary for the life and nourishment of this very curious plant, into which, Dampier says, he many times stuck his knife, and let out the water into his hat, to his great relief. In the mountainous as well as dry low woods of the American continent, and its adjacent islands, this singular vegetable reservoir is very useful to men, birds, and insects, particularly the two latter, which frequent these plants in great numbers.—Native of South America; found also every where in the woods of Jamaica, especially upon decaying trees, which it in time dissolves.

2. Tillandsia Serrata; *Serrate-leaved Tillandsia.* Leaves flat, serrate, spiny above; spike compound; bractes with spinous teeth. Brown call this the Largest Tillandsia, or Wild Pine, with a variegated flower-spike.—Native of Jamaica.

3. Tillandsia Lingulata; *Tongue-leaved Tillandsia.* Leaves lanceolate, tongue-shaped, quite entire, ventricose at the base; flowers yellow, inodorous, three inches long. It grows on large trees, to which it fastens itself by many long dark brown threads, making altogether an oblong root.—Native of South America, Jamaica, and Martinico, where it is called *Wood Pine Apple.*

4. Tillandsia Tenuifolia; *Fine-leaved Tillandsia.* Spikes alternate, imbricate; flowers distich; leaves linear, filiform, erect, bristle-shaped at the tip. Stem a foot high, simple, sheathed, leafy; petals blue.—Native of South America and the Antilles; found on trees.

5. Tillandsia Flexuosa; *Flexuose-spiked Tillandsia.* Spikes loose, flexuose; flowers distich, somewhat remote; leaves lanceolate-linear, reclined. Stem subdivided at the top; two or three feet high; roots filiform, long, rigid; petals three, linear, longer than the calix, turned back at the tip, scarlet or blue.—Found upon the branches of old trees, near the coast of Jamaica, and in the neighbourhood of Carthagena in New Spain.

6. Tillandsia Setacea; *Bristle-leaved Tillandsia.* Spike simple; spathes distich, imbricate; leaves linear, filiform, reclined, smooth. Stem a foot high and more, round, almost upright, covered from the root up to the spike with alternate subimbricate sheaths, broad, ovate at the base, and at the end attenuated into linear setaceous leaves.—Native of Jamaica; found there upon trees.

7. Tillandsia Paniculata; *Panicled Tillandsia.* Leaves radical, very short; culm almost naked; branches subdivided, ascending.—Native of South America and Jamaica, called the Loose-headed Tillandsia, or Wild Pine.

8. Tillandsia Fasciculata; *Bundled Tillandsia.* Spikes lateral, distich, imbricate; leaves lanceolate, subulate, erect, strict. Roots filiform, rigid; stem simple, from one to two feet high, leafy; flowers solitary, sessile between the spathes.—Native of Jamaica, on trees near the coast.

9. Tillandsia Nutans; *Nodding Tillandsia.* Spikes subdivided, nodding; flowers distinct, ovate; leaves ovate-lanceolate, membranaceous; stem almost naked. Plant from one to two feet high; calix three-leaved; leaflets ovate, lanceolate; petals three, ovate-lanceolate, erect, shrivelling, white.—Native of Jamaica, on trees in the mountains.

10. Tillandsia Polystachya; *Many-spiked Tillandsia.* Culm with imbricate lateral spikes.—Native of South America.

11. Tillandsia Monostachya; *One-spiked Tillandsia.* Leaves linear, channelled, reclined; culm simple, imbricate; spike simple.—Native of South America and Jamaica.

12. Tillandsia Pruinosa; *Frosty Tillandsia.* Spike simple; spathe imbricate; leaves lanceolate linear, reclined, these and the spathes tomentose with little scales. Plant a foot or more high, simple, leafy; rootlets filiform, simple, rigid, curled; corolla blue.—Native of Jamaica and Brazil, where it is found on old boughs of trees.

13. Tillandsia Canescens; *Hoary Tillandsia.* Spikes subtern; leaves linear, erect, equalling the stem, hoary. Plant about a foot high; petals long, red.—Native of Jamaica, on trees near the coast.

14. Tillandsia Angustifolia; *Narrow-leaved Tillandsia.* Spikes in bundles; leaves linear-lanceolate, suberect, smooth, surpassing the stem. Stem two feet high, almost upright, simple, sheathed, leafy.—Native of Jamaica and Hispaniola, on the trunks and branches of trees.

15. Tillandsia Recurvata; *Recurvate-leaved Tillandsia.* Leaves awl-shaped, rugged, reclined; culms one-flowered; glume two-flowered. Roots filiform, clustered, whitish; stems aggregate, simple, or leaves constituting the stem sheathing at the base, whence the plant is in fact stemless.—Native of Jamaica, &c. where it is found on old rotten trees.

16. Tillandsia Usneoides; *Mossy Tillandsia.* Filiform, branched, intorted, rugged. Stems the size of a thread, the skin whitish, as if covered with hoar-frost, within tough and black like horse-hair. Many of these stick together on the branches of the Ebony, or other trees, superficially by the middle, and send down on each side some of the same stems, very often a yard long, hanging on both sides, curled or turning and winding one within another, and resembling an old man's beard, as it is commonly named in Jamaica, where it is found upon the trees, but does not grow so common nor so luxuriantly as it does in the more northern provinces of the main continent, where it is said to overrun whole forests. It is frequently imported to Jamaica from North America, for the use of sadlers and coach-makers, who use it to stuff their pannels and cushions. In Louisiana and the neighbouring settlements, this plant being carefully gathered and stripped of the bark, is made into mattresses, cushions, pannels,

&c. It is manufactured by tying the stalks up in bundles, and sinking them in water, or burying them under ground in a moist place, until the bark rots; they are then taken up, boiled in water, and washed until the fibres are quite clear of the pulp. They are not only used instead of horse-hair, but are so very like it, that a man cannot distinguish them, without a strict examination. The Bonana-bird's nest is always made of the fibres of this plant, and is generally found hanging by a few threads from the tops of the most expanded branches of the loftiest trees, especially those that spread over ponds or rivers.——Ten other species of *Tillandsia*, natives of South America, have been described by Mons. Poiret.

Tills. See *Ervum.*

Timber. The uses of Timber are so many, and so great, that the procuring of a sufficient supply of it extremely well deserves the care of every state; as it must be a great disadvantage to any nation, to be driven by necessity to purchase of its neighbours, at a very considerable and continually renewed expense, what might, by an easy economy, be sufficiently supplied at home. This subject should be considered in two points of view; the one to preserve and cherish our growing timber, and the other to renew the trees which are continually cut down. In order to the preservation of our growing Timber-trees, it would be a very useful law, that all who cut down any number of Oaks, should also have a number in good condition for after-cutting; and that no Timber should be cut down, but at a proper age, in regard to the nature of the soil; because it is certain that trees grow to their perfection at very different periods of time, in proportion to the depth of soil they have to grow in; and that as it is, on the one hand, not for the interest of the state to suffer trees to be cut till they have arrived at their perfection for size and soundness, so, after they are arrived at their perfection, it is equally certain that they gradually decay. The quality of the soil the tree stands in may be necessary to be observed for this purpose, but the quantity or depth of it is the great subject of inquiry; and a great number of observations has proved, that the proper season for cutting Oaks, in a soil of two feet and a half deep, is at fifty years old; those which stand in a soil of three feet and a half deep, should not be cut down before seventy years; and those which stand in a soil of four feet and a half deep, and upwards, will increase in goodness and in size till they are a hundred years old: and observation has proved, that after these several periods the trees begin to decay. This seems the best rule to establish with regard to the common soils; but those which grow in a lighter or more sandy soil, may have their periods changed from these to forty, to sixty, and to eighty years at the greatest depth; and afterwards it is much better to fell the wood meant for public service, whether then wanted or not, since it is much better to keep it in public magazines, than to leave it to be daily decaying. As to the supply of young wood, in the place of what is cut down, there are some circumstances which have not had the attention paid to them which they deserve. The spring frosts, which come on at a time when the shoots, by which nature is to supply what is cut down, are just preparing to grow, are of prodigious injury, and do not less mischief to these than to the young shoots of garden plants, though the distant hope of the succession of the proprietor, and usually also the distance of the place, and want of repeated observations, occasion its not being perceived. It has, however, been proved, that the mischiefs done by these frosts, affect in a much greater degree those shoots which are exposed to the south, than those which face the north; and that it operates more powerfully against such as are wholly exposed to the wind, than against such as are sheltered. These known circumstances may give the hint to a method of saving, at least, a great part of the wood to be felled, from this destruction; to its renewal, by the making it a rule to begin cutting down on the northern side; and, as the whole felling is a work of some years, the standing wood of every season will defend the young shoots of the newly cut stumps the following spring, not only from the south exposure, but will shelter them also from the winds.—The following list contains those kinds of Timber which are most serviceable, specifying their uses: it is taken from Evelyn's *Sylva:* for the particulars of their growth and cultivation, see the several genera to which they belong.—*Oak.* It endures all seasons and weathers; there is no wood like it, especially where it lies exposed to both air and water, or for pales, shingles, posts, rails, boards, &c.—*Elm.* This timber, when felled between November and February, is all heart, and has no sap. It is of singular use in places where it either is always wet or always dry; its toughness likewise makes it useful to wheel and mill wrights.—*Beech.* This wood is principally used in turnery, joinery, upholstery, and the like, as being of a clean, white, fine grain, not apt to bend nor slit: it has been sometimes, especially of late, used for building-timber, and, where it lies constantly wet, is said to outlast Oak.—*Ash.* Its use is almost universal; it is good for building, or other occasions where it may lie dry; and is used by carpenters, coopers, turners, plough-wrights, wheel-wrights, gardeners, &c. it is also used for oars, handspikes, &c.—*Fir.* Commonly known by the name of *Deal*, is now universally used in buildings, especially within doors, for stairs, floors, wainscot, and most works of ornament.—*Walnut.* This timber is of universal use, excepting for the outsides of buildings; none is better for the joiner's use, because it is less subject to worm than the Beech, and is of a fine brown colour, taking a good polish.—*Chestnut.* This timber is very lasting.—*Service-Tree.* This is principally used in joinery, being of a delicate grain, and fit for curiosities: it sometimes yields beams of a considerable size, proper for building.—*Poplar.* This and *Aspen* differ very little from each other, and are much used of late instead of Fir.—*Alder.* This is much used for sewers or pipes, to convey water: when kept always wet, it becomes hard like stone; but if exposed to air and water alternately, soon becomes rotten. See *Woods.*

Timmia; a genus distinguished from *Bryum* merely by the connection of the points of the inner fringe; of the class Cryptogamia, order Musci. Essential Character. *Capsule:* ovate; outer *Fringe* of sixteen pointed teeth; inner membranaceous, with jointed teeth combined at the top. *Male Flowers:* on the same plant, axillary, stalked, bud-shaped. ——The known species are two only, viz.

1. Timmia Megapolitana. Native of North America; where it occurs in boggy ground, growing among *Carices.*

2. Timmia Austriaca. Found upon the celebrated mountain Schneeberg in Austria.

Timothy Grass. See *Phleum.*

Toad Flax. See *Antirrhinum.*

Tobacco. See *Nicotiana.*

Toluifera; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-toothed, almost equal, with one angle more remote. *Corolla:* petals five, inserted into the receptacle, of which four are equal, linear, a little longer than the calix; the fifth twice as big, obcordate, its claw length of the calix. *Stamina:* filamenta ten, very short; antheræ longer than the calix. *Pistil:* germen oblong; style none; stigma acute. *Pericarp:* berry round, four-celled, four-seeded. *Seed:* single, ovate. Essential Character. *Calix:* five-toothed, bell-

shaped. *Petals:* five, the lowest twice as big, obcordate; style none.——The only known species is,

1. Toluifera Balsamum; *Balsam of Tolu Tree.* Leaves alternate, oblong, ovate, four inches long, and two inches broad in the middle, rounded at the base, acuminate at the end, smooth, of a light green colour, on very short strong footstalks; the flowers are produced in small axillary racemes or bunches, each on a slender pedicel; the corolla has four narrow petals of a yellow colour, a little longer than the calix, and a fifth, the claw of which is of the same length as the other petals, and the top ovate-cordate. Balsam of Tolu, which is brought to Europe in little gourd-shells, is obtained by making incisions in the bark of this tree, and is collected into spoons made of black wax, and poured from the spoons into proper vessels. It is of a reddish-yellow colour, thick and tenacious in consistence; by age it grows so hard and brittle that it may be rubbed into a powder between the finger and thumb. It has an extremely fragrant smell, somewhat resembling that of lemons; its taste is warm and sweetish, and, on being chewed, it adheres to the teeth: thrown into the fire, it immediately liquefies, takes flame, and disperses its agreeable odour. Though it does not dissolve in water, still, if boiled in it for two or three hours in a covered vessel, the water acquires its odoriferous smell, and also suffers a similar impregnation when the Balsam is distilled. With the addition of mucilage, it unites with water so as to form a milky solution. Spirits of wine entirely dissolve it, and it easily mixes with distilled oils, but least freely with those of the expressed kind. Distilled without addition, not only an empyreumatic oil, but sometimes a small portion of a saline matter, similar to that of the flowers of Benzoin, is obtained. It possesses the same general virtues with the Balsam of Gilead and Peru, but is less heating and stimulating, and may be more safely taken. It has been chiefly used as a pectoral, and is reputed to be an excellent corroborant in gleets and seminal weaknesses. It is excellent in consumptions, and other disorders of the breast, and may be given in pills. The Balsamic Syrup of the apothecaries is made from it, and possesses a great deal of its virtues.—*Propagation and Culture.* Sow the seeds in pots filled with light earth, as soon as they arrive, and plunge them into the tan-pit. If they have not been taken out of their covers, it will be long before they will vegetate. When the plants are large enough to remove, transplant them carefully, each into a separate pot, and plunge them into a good hot-bed of tanners' bark, shading them from the sun until they have taken new root: after which treat them in the same way as the Coffee-tree. The seeds should be gathered ripe, and, whilst fresh, should be put up in sand, to protect them effectually from insects.

Tomex; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* involucre universal five-leaved, five-flowered, permanent; leaflets ovate, very concave, externally tomentose, very blunt, unequal, imbricate; outer smaller. *Perianth:* proper five-leaved, permanent; leaflets lanceolate, externally villose, from upright spreading. *Corolla:* none, unless the proper perianth be considered as such. *Nectary:* scales five, between the interior stamina, plaited, crenate, smooth, length of the filamenta. *Stamina:* filamenta twelve, filiform, unequal; exterior five, length of the perianth; interior seven, shorter; antheræ twin. *Pistil:* germen three-sided, smooth; superior; style none; stigma awl-shaped. *Pericarp:* berry. *Seed:* one. *Observe.* The involucre is seldom six-leaved, six-flowered. Essential Character. *Involucre:* four or five leaved. *Calix:* none. *Corolla:* five-petalled. *Nectary:* scales five, between the lower stamina. *Berry:* one-seeded.——The species are,

1. Tomex Japonica; *Japanese Tomex.* Floscules corolled; leaves tomentose beneath. Stem arborcous, lofty, branched, more than a fathom in height; branches and branchlets tomentose, knobbed, the end ones angular; flowers axillary, collected into a head.—Native of Japan, where it flowers in October and November.

2. Tomex Tetranthera; *Laurel-leaved Tomex.* Floscules corolled; leaves smooth. Branches round, yellowish, the younger ones rough-haired; corolla five-petalled, white; berry globular, red, the size of a red currant.—Native of China.

3. Tomex Sebifera; *Glutinous Tomex*, or *Tallow Tree.* Floscules apetalous; leaves smooth. Branches round, knobbed, covered with a yellow shining bark: the branchlets are covered with a fine down; corolla none. The leaves and twigs abound in a viscid juice, and being bruised and macerated in water render it glutinous; hence the natives work up their plaster with it, to render it more tenacious and durable. A great quantity of a thick white oil is extracted from the berries, of which common candles are made, resembling spermaceti or wax candles, but having an unpleasant smell. It is a large tree; the berries are small, smooth, and blackish.—Found in the woods of China and Cochin-china.

Tonsella; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, permanent, five-parted; segments ovate-acute. *Corolla:* petals five, ovate, thick, permanent, inserted into the receptacle, longer than the calix; nectary pitcher-shaped, quite entire, surrounding the germen. *Stamina:* filamenta three, inserted into the inner wall of the nectary, after flowering spreading; antheræ roundish. *Pistil:* germen roundish, surrounded by the nectary; style cylindrical, short; stigma simple. *Pericarp:* berry spherical, one-celled, accompanied by the calix and corolla. *Seeds:* four. Essential Character. *Calix:* five-parted. *Petals:* five. *Nectary:* pitcher-shaped. *Berry:* one-celled, four-seeded.——The species are,

1. Tonsella Scandens; *Climbing Tonsella.* Leaves quite entire, acuminate; branches round, hairy at top, and covered with a purplish somewhat rugged bark.—This tree has been found in Guiana, and the island of Trinidad.

2. Tonsella Africana; *African Tonsella.* Leaves obtuse, glandular-toothed. It resembles the preceding, but the corollas are larger, and the antheræ sessile.—Native of Guinea.

3. Tonsella Angulosa; *Entire-leaved Tonsella.* Leaves pointed, entire; branches angular, smooth.—Found at Sierra Leone.

4. Tonsella Decussata; *Cross-branched Tonsella.* Leaves oblong-ovate, obtusely serrated, polished; panicles forked.—Native of woods upon the Andes.

5. Tonsella Multiflora; *Many-flowered Tonsella.* Leaves obovate, entire, polished; stalks crowded, each bearing two or three flowers.—Found in Cayenne.

Toothwort. See *Dentaria.*

Torch Thistle. See *Cactus.*

Tordylium; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* umbel universal equal, manifold; partial unequal, manifold, very short, flat: involucre universal, of slender undivided leaflets, commonly the length of the umbel; partial halved, outwardly longer than the umbellet; perianth proper five-toothed. *Corolla:* universal difform, radiate; florets all fertile; proper of the disk of five equal inflex-cordate petals; proper of the ray similar, but the outmost petals very large and two-parted. *Stamina:* all with five capillary filamenta; antheræ simple, roundish. *Pistil:* all with a roundish inferior germen; styles two, small; stigmas obtuse. *Pericarp:* fruit suborbicular, compressed, crenulate at the edge, bipartite. *Seeds:* two,

roundish, almost flat, with a raised crenulate margin. Essential Character. *Corolla:* radiate; flowers all hermaphrodite. *Fruit:* suborbicular, notched at the edge. *Involucres:* long, undivided.——The species are,

1. Tordylium Syriacum: *Syrian Hartwort.* Involucres length of the stamina, club-shaped; stigma circumcised, entire, longer than the umbel. Stalks seldom a foot high, branching out into three divisions, terminating by umbels of white flowers. It is annual, flowering in July.—Native of Syria.

2. Tordylium Officinale; *Officinal Hartwort.* Involucrets length of the leaves; leaflets ovate, gashed, crenate. Stem pubescent; root annual; flowers flesh-coloured, with the outer petals very large and radiant. The seeds dried and reduced to powder, or a strong infusion of them, are good to promote obstructed menses, and the necessary evacuations after delivery; they likewise operate by urine, and cure the colic; and being of a warm cordial nature, strengthen the stomach, disperse wind, and procure an appetite.—Native of the south of France, Italy, and Sicily: it is very doubtful whether it be indigenous of England, though it is said to have been found at Isleworth, and in the vicinity of London.

3. Tordylium Peregrinum; *Oriental Hartwort.* Seeds grooved, wrinkled, plaited; universal involucre one-leafed, subtrifid; stem smooth, branched.—Native of the Levant.

4. Tordylium Apulium; *Apulian* or *Small Hartwort.* Umbellets remote; leaves pinnate; pinnas roundish, laciniate. In a garden it rises a foot and half high: flowers white, with broad lanced petals turning inwards so as to appear cordate. The wild plant is more hairy than the cultivated one.—Native of Italy, Barbary, and Greece.

5. Tordylium Maximum; *Great Hartwort.* Umbels clustered, radiate; leaflets lanceolate, gash-serrate; stem rough, with deflexed bristles; root annual, tapering. Stem erect, three or four feet high, branched, leafy, flexuose, furrowed, rough with minute rigid bristles, bent down, close, hollow within.—Native of Germany, Switzerland, Austria, France, Italy, and England; in the last it occurs on the north side of the parks at Oxford.

6. Tordylium Filifolium; *Red Dwarf Hartwort.* Umbels clustered, radiate; leaflets lanceolate, gash-serrate; stem rough, with deflexed bristles; leaves unequally pinnate; petals red, one of them very large in the outer florets.—Native of Carniola.

7. Tordylium Secacul; *Arabian Hartwort.* Umbellets remote; leaves doubly pinnate; pinnas gashed, tomentose; stalks taper, not channelled, rising above two feet and a half high, having a few small hairs scattered over them, with one smaller pinnate leaf at each joint. It flowers in June, and the seeds ripen in August.—Native of Syria, especially about Aleppo, where it is known by the name of Secacul.

Torenia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, tubular, angular, permanent, bifid; upper lip three-cusped; lower narrower, quite entire. *Corolla:* one-petalled, ringent; upper lip entire; lower trifid, the middle segment more produced. *Stamina:* filamenta four; the two upper simple, the two lower two-parted, the lower branchlet shorter and barren; antheræ twin, contiguous by pairs. *Pistil:* germen oblong; style filiform, thicker above; stigma bifid, acute. *Pericarp:* capsule oblong, two-celled. *Seeds:* very many, roundish. Essential Character. *Calix:* two-lipped; upper lip three-cusped. *Filamenta:* the lower with a sterile branchlet. *Capsule:* two-celled. ——The species are,

1. Torenia Asiatica; *Smooth Torenia.* Smooth: stem creeping; leaves ovate, emarginate, on long petioles; flowers larger than in the next species.—Native of India and China.

2. Torenia Hirsuta; *Hairy Torenia.* Hirsute: stem erect; leaves very short, petioled. The whole of this plant is hirsute; flowers smaller, on one-flowered, axillary, and terminating peduncles.—Native of the East Indies.

3. Torenia Cordifolia; *Heart-leaved Torenia.* Somewhat hairy, erect; leaves heart-shaped, on short petioles; stem from six to eight inches high; branches cruciate, ascending, purplish, a little hairy; leaves serrate, paler beneath, an inch long, and three-quarters of an inch broad; flowers axillary, solitary, pedicelled, large in proportion to the plant; corolla bluish purple.—Native of Coromandel, in moist pasture-lands about Samulcotta, flowering during the cold season.

Tormentilla; a genus of the class Icosandria, order Polygynia.—Generic Character. *Calix:* perianth one-leafed, flat, eight-cleft; the alternate segments smaller, and more acute. *Corolla:* petals four, obcordate, flat, spreading, inserted by their claws into the calix. *Stamina:* filamenta sixteen, awl-shaped, shorter by half than the petals, inserted into the calix; antheræ simple. *Pistil:* germina eight, small, converging into a head; styles filiform, length of the stamina, inserted into the side of the germen; stigmas obtuse. *Pericarp:* none; receptacle of the seeds very small, loaded with seeds, enclosed within the calix. *Seeds:* eight, roundish, naked. *Observe.* This genus differs from *Potentilla* in number only: hence the two genera might be combined, as in fact they have been by Schrœber and others. Essential Character. *Calix:* eight-cleft, inferior. *Petals:* four. *Seeds:* roundish, naked, wrinkled, fastened to a small juiceless receptacle.——The species are,

1. Tormentilla Erecta; *Common Tormentil.* Stem somewhat upright, branched; leaves sessile. Root remarkably large and woody, brown on the outside, red within; flowers bright yellow, on long, simple, solitary, lateral stalks.—This is a plant of considerable importance in economy and medicine. The root has been long held in great estimation by physicians, as a very useful astringent; and as the resin it contains is very inconsiderable, it seems more particularly adapted to those cases where the heating and stimulating medicines of this class are less proper; as in phthisical diarrhœas, diarrhœa cruenta, &c. Dr. Cullen thinks it has been justly commended for every virtue that is competent to astringents; and says, I myself have had several instances of its virtues in this respect; and particularly have found it, both by itself, and joined with Gentian, cure intermittent fevers; but it must be given in substance, and in large quantities. Rutty also recommends it in old putrid ulcers, in sores of the mouth, throat, and jaws, and in bleeding gums, and to restore the tone of the stomach: he asserts, that no vegetable is of more efficacy in fluxes, fluor albus, &c. The root may be given in powder from half a drachm to one drachm or more in a dose; but it is more generally administered in decoction. An ounce and half of the powdered root is boiled in three pints of water to a quart, adding, towards the end of the boiling, a drachm of cinnamon: of the strained liquor, sweetened with an ounce of any agreeable syrup, two ounces or more may be taken four or five times a day. Farmers find them very efficacious in the dysenteries or fluxes of cattle. Hill informs us, that it is an excellent astringent; the roots possess the greatest virtues, and may be given either in powder or decoction: in the first method, twelve grains is a sufficient dose; in the latter, an ounce and half may be put into three pints of water, and boiled till it comes to a quart, of which a quarter of a pint may be taken three or four times a day. It is likewise a cordial and sudorific, and therefore excellently adapted for feverish complaints attended with purgings. It is at all times a good medicine in the small-pox; but

when a purging comes on improperly in that disorder, nothing excels it. The root in powder is good for those that spit blood, also against the bleeding piles, bloody stools, and immoderate menses. The roots of this plant are used in most of the western isles of Scotland, and in the Orkneys, to tan leather, for which they are thought to be superior to Oak-bark. They are first boiled in water, and the leather is then steeped in the cold liquor. In the islands of Tyrie and Col the inhabitants have destroyed so much ground by digging them up, that the further use of the plant has been prohibited. They are also used for dyeing a red colour; and for rearing swine, upon the mountains of Killarney in Ireland.—Native of Europe in dry pastures, especially on heaths among small shrubs, flowering in June and July. Some flowers are occasionally found with five petals, and ten segments of the calix; but this rarely happens.

2. Tormentilla Reptans; *Trailing Tormentil.* Stem prostrate, simple; leaves petioled. Root perennial, small, and slender; stems few, nearly two feet long, often simple, entirely prostrate, but not creeping. The whole herb hairy, and of a light green; peduncles solitary, longer than the leaves, opposite to a leaf, or axillary; corolla bright yellow, twice as large as in the common sort; petals obcordate, roundish; seeds wrinkled.—This plant differs from Potentilla Erecta in having a trailing seem not striking root at the joints; whilst that has a creeping stem which takes root at every joint.—Native of Germany and England; with us, it occurs about hedges and the borders of fields, in dry places, but is by no means common. It has been observed by Ray on the borders of corn-fields between Hockley and Shotover woods, and elsewhere in Oxfordshire. It has been found in the wood under Shotover hill, and at Headington, in the parish of Braintree in Essex; in Surry; at Berkhamstead in Hertfordshire; at Lakenham near Norwich; at Brighouse near Halifax, Yorkshire; near Manchester; in Purbeck; in the closes at New Bridge, between Ringwood and Winbourne; under Hod-hill; and not unfrequently in Ireland.

Tortula; a genus of the class Cryptogamia, order Musci. The *stems* are erect, sometimes short, or nearly wanting; *root* fibrous, mostly perennial; *leaves* entire; *fruit-stalks* terminal, or lateral; *capsule* nearly erect, generally even, rarely furrowed; *lid* conical or awl-shaped; *fringe* long, brown, or deep red, elegantly twisted, its points rather loose and spreading. Essential Character. *Capsule:* oblong. *Fringe:* simple, of numerous capillary teeth, spirally and repeatedly twisted together. It is a most natural genus, of a dwarfish habit.——The species are,

1. Tortula Rigida; *Rigid Screw Moss.* Stem very short; leaves spreading, rigid, involute, obtuse, ribless; capsule cylindrical; lid conical. It bears capsules in the winter and early spring. Fringe brown, of thirty-two fine teeth.—Found on rocks, walls, chalky banks and cliffs, in England, and all over Europe. It has been observed upon the right hand of the road from Norwich to Yarmouth, a little beyond Thorpe.

1. Tortula Convoluta; *Convoluted Screw Moss.* Branches short; stem-leaves lanceolate, keeled, those of the sheath obtuse, convoluted, and ribless; lid taper, oblique. The perennial roots bear broad, dense patches of very low leafy stems, with very short branches.—Native of sandy heaths, dry banks, and walls, in England, Ireland, Sweden, and Germany.

3. Tortula Nervosa; *Rib-sheathed Screw Moss.* Stem much branched; leaves all ovate, acute, keeled, with a midrib; sheaths between the branches, imbricated.—It bears capsules in March, and is very common in England, Germany, and Sweden.

4. Tortula Stellata; *Starry-furrowed Screw Moss.* Stem none; leaves ovate, keeled, incurved; capsule erect, ovate, somewhat cylindrical, furrowed; lid oblique.—Found principally in Scotland, in the neighbourhood of rivers.

5. Tortula Ruralis; *Great Hairy Screw Moss.* Stem branched; leaves obtuse, recurved, hair-pointed, the uppermost stellated; capsule cylindrical, somewhat ovate. This is much larger than any of the preceding; the stems, about two inches high, compose broad cushion-like patches, of a dirty hoary aspect in dry weather, dark green in wet; and bearing abundance of upright capsules, on long red stalks, in winter and spring.—Found on walls, roofs, and trunks of trees, all over Europe.

6. Tortula Subulata; *Awl-shaped Screw Moss.* Stem nearly simple, short; leaves ovate-lanceolate, pointed; capsule cylindrical; lid awl-shaped, straight. It forms dense perennial tufts, of a fine deep green, bearing capsules in March and April.—Found in damp shady places in the internal countries of Europe: rare in Sweden and Scotland.

7. Tortula Muralis; *Wall Screw Moss.* Stem mostly simple, very short; leaves ovate, acute, hair-pointed; capsule cylindrical, slightly elliptical; lid conical. This is perhaps the most universal of all Mosses throughout Europe. Every wall and bank is covered with it; and the abundant capsules, produced in winter and spring, remain in a dry and empty state almost throughout the year. The stems are very short, composing broad dark-green patches, and rendered hoary by the terminal white hairs of the leaves.

8. Tortula Cuneifolia; *Wedge-shaped Screw Moss.* Stem very short, mostly simple; leaves obovate, reticulated, pellucid, slightly pointed; capsule cylindrical; lid conical.—Found on banks and sandy ground, at Streatham in Surry; abundantly about Oxford; and on some old banks at Hopton near Yarmouth.

9. Tortula Tortuosa; *Frizzled Mountain Screw Moss.* Stem branched, level-topped; leaves linear, inclining to lanceolate, keeled, twisted and undulated when dry; capsule cylindrical, slightly ovate; fringe lax. A large and handsome species, whose stems, from two to four inches high, compose broad and soft tufts of a most beautiful green.—Plentiful on the mountains of Wales, Scotland, and the north of England, Derbyshire, &c.; found also in Sweden, Germany, and Italy.

10. Tortula Barbata; *Bearded Lateral Screw Moss.* Stem branched from the base; leaves elliptic-lanceolate, spreading, somewhat revolute; fruit-stalks lateral; capsule ovate.—Found on walls and heaths, during winter and spring; sometimes met with in the neighbourhood of London.

11. Tortula Imberbis; *Deciduous Screw Moss.* Stem branched; leaves awl-shaped, spreading, ovate at the base; capsules cylindrical, somewhat elliptical.—It occurs on walls, dry banks, and among grass, perfecting its capsules very early in the spring.

12. Tortula Aristata; *Short-pointed Screw Moss.* Stem branched, level-topped; leaves oblong, obtuse, with a minute point, curved inward and twisted when dry; capsule cylindrical.—Found on walls about Croydon in Surry.

Tournefortia; (so called by Linneus in memory of Joseph Pitton de Tournefort, the author of an elegant arrangement of plants, under the title of *Institutiones Rei Herbariæ*, &c.) a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, small; segments awl-shaped, permanent. *Corolla:* one-petalled, funnel-form; tube cylindrical, globular at the base; border half five-cleft, spreading; segments acuminate, horizontal, gibbous in the middle. *Stamina:* filamenta five, awl-shaped, at the throat of the corolla; antheræ simple, in the throat converging, acuminate. *Pistil:* germen globular, superior; style

simple, the length of the stamina, club-shaped; stigma bare, umbonate. *Pericarp:* berry globular, two-celled, perforated by two pores at top. *Seeds:* four, subovate, separated by pulp. ESSENTIAL CHARACTER. *Corolla:* funnel-shaped; throat naked. *Stamina:* in the tube. *Stigma:* umbonate. *Berry:* two-seeded, superior, perforated at top by pores. The plants of this genus are propagated by seeds, which must be procured from the countries where they grow naturally. The seeds should be sown in small pots filled with light earth, and plunged into a hot-bed of tanners' bark. They sometimes grow within the first year, but oftener remain in the ground a whole year; therefore if the plants should not come up in the same season, the pots should be plunged in autumn into the tan-bed in the stove, where they should remain all the winter, and in the spring be removed out, and plunged into a fresh tan-bed, which, if the seeds be good, will soon bring up the plants. When they become fit to remove, plant each in a small pot, plunging them into a tan-bed, where they must be shaded from the sun till they have taken new root, and must then be treated in the same way as other tender plants from the same countries, which require to be constantly kept in the bark-stove. They may also be increased by cuttings.——The species are,

1. Tournefortia Serrata; *Serrate-leaved Tournefortia.* Leaves ovate, serrate; petiole spinescent; spikes terminating, recurved.—Native of South America.

2. Tournefortia Hirsutissima; *Hairy Tournefortia.* Leaves ovate, petioled, acuminate; stem hirsute; spikes branched, terminating; berries hirsute; flowers white, directed all one way.—Browne says, that in the West India Islands, where this plant is a native, it raises itself generally by the help of the neighbouring trees, and shoots sometimes to a considerable height in the woods.

3. Tournefortia Volubilis; *Climbing Tournefortia.* Leaves ovate, acute, deflexed, rough with minute points; petioles reflexed; stem twining. The flowers are produced in branching spikes from the side and top of the branches; they are small and white; and are succeeded by small, white, succulent berries, having one or two black spots on each; seed one in each cell. It flowers in July and August.—Native of Jamaica.

4. Tournefortia Syrengæfolia; *Lilac-leaved Tournefortia.* Leaves subcordate, ovate, acuminate, smooth; spikes branched; branches petioled; midrib of the leaves on both sides, and the nerves beneath, and peduncles, villose; flowers alternate, approximating; corollas somewhat villose on the outside.—Found in Cayenne.

5. Tournefortia Fœtidissima; *Fetid Tournefortia.* Leaves ovate, lanceolate, rough-haired; peduncles branched; spikes pendulous. Stems shrubby, ten or twelve feet high, sending out many branches, which are terminated by long branching spikes of flowers, ranged on one side like those of the Heliotrope. The flowers are of a dirty white colour, small, and closely set.—Native of the West Indies.

6. Tournefortia Humilis; *Dwarf Tournefortia.* Leaves lanceolate, sessile; spikes simple, recurved, lateral. Stalks low, shrubby, seldom rising more than three feet high, sending out a few slender woody branches. The flowers come out in single axillary spikes; they are white, and are succeeded by small succulent berries.—Native of South America.

7. Tournefortia Bicolor; *Two-coloured Tournefortia.* Leaves ovate, acuminate, smooth, somewhat wrinkled above; spikes cymed, erect, recurved. Trunk round, branched, even; branches hirsute, alternate, almost upright, round, smooth; corollas greenish-white, with an hoary tube.—Native of Jamaica, in coppices.

8. Tournefortia Cymosa; *Broad-leaved Tournefortia.* Leaves ovate, quite entire, naked; spikes cymed; stem a fathom in height.—Native of Jamaica; where, Browne informs us, it is sometimes observed in the woods, and remarkable for the thickness of its upper branches, and the length of its pendulous flower-spikes. It flowers in July.

9. Tournefortia Argentea; *Silvery Tournefortia.* Leaves ovate, obtuse, tomentose, silky; spikes terminating, compound. Trunk very short, covered with a deeply cloven bark; branches spreading, very much hirsute; panicle large, divided into spikes, directed one way, and rolled back; flowers snow-white; tube short; border recurved; berries not perforated. It is the handsomest species of the genus.—Native of the shores of Ceylon, &c.

10. Tournefortia Sericea; *Silky Tournefortia.* Leaves ovate, lanceolate, beneath tomentose, silky; spikes lateral and terminating, dichotomous, panicled. This has the appearance of the third species; flowers small, distinct, alternate.—Found by Ryan in Montserrat.

11. Tournefortia Suffruticosa; *Hoary-leaved Tournefortia.* Leaves sublanceolate, hoary; stem suffruticose. Branches slender, woody; flowers terminating and axillary, in slender branching spikes, which are recurved; they are white, and succeeded by small succulent berries, which contain two or three seeds.—Native of Jamaica, by the sea-side.

12. Tournefortia Scandens; *Climbing Tournefortia.* Leaves cordate, hirsute; spikes racemed, reflexed; stem twining, shrubby, branching, rising to the height of ten or twelve feet; the flowers come out at the ends of the branches, in very slender branching spikes; they are small, and of a dirty brown colour.—Found in Jamaica.

13. Tournefortia Tomentosa; *Downy Tournefortia.* Leaves cordate, tomentose beneath; spikes racemed, short; stem twining, rising to the height of ten or twelve feet, upon any neighbouring support; flowers of a dirty white colour, small; berries juicy, enclosing two, three, and sometimes four seeds.—Found near Carthagena, in New Spain.

14. Tournefortia Carnosa; *Fleshy-leaved Tournefortia.* Leaves ovate, wrinkled, petioled; spikes racemed, axillary; stem shrubby, strong, woody, covered with a light brown rough bark; flowers in branching axillary spikes, small and white; succeeded by small succulent berries; enclosing two or three oblong seeds.—Found near Carthagena, in New Spain.

Tourrettia; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, tubular, before flowering coloured, two-lipped; upper lip acute, lower indistinctly four-toothed, having a membrane internally. *Corolla:* one-petalled; tube compressed, length of the calix; upper lip galeate, compressed, with the margins converging; lower lip none, but in place of it a double toothlet. *Stamina:* filamenta four, filiform, concealed under the upper lip, two of them shorter; antheræ two-lobed. *Pistil:* germen oblong, somewhat four-cornered, tubercled; style filiform, length and situation of the lip; stigma bifid. *Pericarp:* capsule oblong, coriaceous, muricate with spines, some of which are hooked, four-celled, two-valved. *Seeds:* four to six in each cell, subtriquetrous, ovate, girt with a membranaceous margin, emarginate, and crenulate at the base. ESSENTIAL CHARACTER. *Calix:* two-lipped. *Corolla:* lower lip none, but two toothlets instead of it. *Capsule:* echinate, four-celled, two-valved.——The only known species is,

1. Tourrettia Lappacea. Leaves opposite, the primordial ones ternate; lateral leaflets two-parted, at the next knot double, ternate, without a tendril; at the upper knots of the stem ternate, decompound or pedate, with the common petiole growing out into a convoluted branched tendril; root annual;

stems two cubits high, scandent, four-cornered, fistulous, branched; flowers in a naked terminating raceme, of a dusky violet colour at the base of the peduncles, which are alternate and very short; there is a bristle-shaped bracte at the base of each flower. The plant is of very luxuriant growth, filling a moderate-sized stove. The flowers are produced in abundance from midsummer till the end of autumn.—Native of Peru.

Tower Mustard. See *Turritis.*

Toxicodendrum; a genus of the class Dicœcia, order Polyandria. Essential Character. *Male. Calix:* of several leaves. *Corolla:* none. *Stamina:* from ten to twenty, very short. *Female. Calix:* of several imbricated leaves. *Corolla:* none. *Style:* one. *Stigmas:* three. *Capsule:* three-celled, six-valved. *Seeds:* two in each cell.——There is but one species, viz.

1. Toxicodendrum Capense; *Hyæna Poison.* A shrub, or small tree, six or seven feet high, with spreading branches. Fruit smooth, about the size and shape of a Hiccory nut. This, on being beaten to powder, is used to poison the carcases of lambs, &c. by feeding on which the hyænas are effectually destroyed.—Found at the Cape, on a single spot, in a rocky soil, on Wind-Hoek mountains, near Elephant's river.

Tozzia; a genus of the class Didynamia, order Angiospermia. Essential Character *Calix:* tubular, five-toothed. *Corolla:* ringent, with five rounded segments. *Capsule:* one-celled, globular, two-seeded.——The only species yet discovered is,

1. Tozzia Alpina. Leaves round, bluntly notched, pale; root formed of roundish scales; stem square, branched. The whole habit tender and succulent: peduncles axillary, short, one-flowered; flowers yellow, with the three lower segments spotted of a deeper yellow, serrate; fruit globular, drawn out into a conical point.—Native of the mountains of Switzerland, Austria, south of France, Italy, and the Pyrenees, in rough moist places.

Trachelium; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, very small, superior. *Corolla:* one-petalled, funnel-form; tube cylindrical, very long, very slender; border patulous, small, five-parted; segments ovate, concave. *Stamina:* filamenta five, capillary, nearly the length of the corolla; antheræ simple, oblong. *Pistil:* germen three-sided, roundish, inferior; style filiform, twice as long as the corolla; stigma globular. *Pericarp:* capsule roundish, obtusely three-lobed, three-celled, opening by three holes at the base. *Seeds:* numerous, very small. Essential Character. *Corolla:* funnel-form. *Stigma:* globular. *Capsule:* three-celled, inferior.——The species are,

1. Trachelium Cœruleum; *Blue Throatwort.* Branched, erect: leaves ovate, serrate, flat, about two inches long, and one inch broad in the middle, ending in acute points; corymbs compound. Root perennial, fleshy, tuberous, sending out many fibres, which spread wide on every side. The stalks rise a foot and half high, with leaves on them, shaped like those at the bottom. The flowers are small, and of an azure blue colour, appearing in June and July, and ripening seeds in September. It derives its name from the length of its neck, *throat*, or tube of the corolla. Biennial.—Native of Italy and the Levant. It is propagated by seeds, which should be sown in autumn when they are ripe; for when they are kept out of the ground till spring, they frequently fail; or if they do grow, it is not before the following spring. When the plants appear, keep them free from weeds, and as soon as they are big enough to remove, transplant them to a border with an eastern aspect, and light undunged earth, placing them in rows six inches apart, and four inches distant in the rows, shading them from the sun till they have taken new root; after which they will only require weeding till autumn, when they may be transplanted into the borders of the flower-garden, where they will flower in the ensuing summer. But as they will thrive better in old walls, when by accident they have arisen from seeds; so their seeds, when ripe, may be scattered on such walls as are old, or where there is earth lodged sufficient to receive the seeds; where the plants will come up, and resist the cold much better, and continue longer, than when sown in the full ground.

2. Trachelium Diffusum; *Spreading Throatwort.* Very much branched, diffused; branches divaricating, recurved; leaves awl-shaped; flowers blue, small.—Native of the Cape.

3. Trachelium Tenuifolium; *Fine-leaved Throatwort.* Nearly upright: leaves linear, ciliate, hispid; flowers numerous, axillary, white or pale yellow.—Native of the Cape.

Tradescantia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* perianth three-leaved; leaflets ovate, concave, spreading, permanent. *Corolla:* petals three, orbicular, flat, spreading very much, large, equal. *Stamina:* filamenta six, filiform, length of the calix, erect, villose with jointed hairs; antheræ kidney-form. *Pistil:* germen ovate, obtusely three-cornered; style filiform, length of the stamina; stigma three-cornered, obtuse. *Pericarp:* capsule ovate, covered by the calix, three-celled, three-valved. *Seeds:* few, angular. *Observe.* The form of the style varies. Some of the species have naked filamenta. The tenth has only one stamen, and the twelfth three. Essential Character. *Calix:* three-leaved. *Petals:* three. *Filamenta:* erect, with jointed hairs. *Capsule:* three-celled. ——The species are,

1. Tradescantia Virginica; *Common Virginia Spiderwort.* Erect: leaves lanceolate, smooth; flowers heaped in an umbel, terminating; calix hairy. Root composed of many fleshy fibres; stalks smooth, rising a foot and half high; flowers in clusters, composed of three large spreading purple petals; they appear early in June, and though each flower continues but one day, whence this plant acquired the name of Ephemerum, yet such is the profusion, that there is a succession of them through the greater part of the summer. The fine blue of the corolla, with the hairy filamenta of the same colour in the middle, tipped with the large yellow antheræ, would render this a favourite flower, if it were not so common. Some authors have called it *Phalangium*, from its supposed property of curing the bite of a spider. There are two varieties, one with a deep blue, and the other with a white flower, but they vary from one to another when raised from seeds.—Found in shady woods from Pennsylvania to Carolina, flowering in May and June. This plant multiplies so fast by the roots and seeds, that where the latter are permitted to fall, it must be yearly reduced, to be kept within bounds. The best time to remove and part the roots, is in autumn.

2. Tradescantia Crassifolia; *Thick-leaved Spiderwort.* Erect: leaves ovate, woolly at the edge and beneath; flowers heaped in umbels, terminating. The flowers are of a pale violet, and expand only three or four hours in a morning; the petals are about half an inch in diameter, orbicular, and curled at the edge; the filamenta are blue, bearded, and the antheræ very dark blue. The leaves of this species distinguish it from the rest of the genus.—Native of Mexico, flowering in September. This, and the twelve next following species, with those from the sixteenth to the nineteenth species, require the heat of a stove, in which some of them may be abundantly increased both by seeds and offsets: the former method is to be preferred.

3. Tradescantia Erecta; *Upright Spiderwort.* Erect: leaves ovate, narrowed at the base, smooth; peduncles terminating, naked, bifid, racemed. Stems herbaceous, thick, round, jointed, three feet high, branched; branches axillary, and while tender villose; corolla purple-violet, a little bigger than the calix; petals orbicular, with short claws. It varies with violet-coloured corolla and stamina, in the same umbel. Annual.—Native of Mexico, flowering in July and August.

4. Tradescantia Zanonia; *Gentian-leaved Spiderwort.* Erect: leaves broad-lanceolate; peduncles lateral, solitary, jointed in the middle, many-flowered; bractes in pairs. Plant herbaceous, two feet high; stem simple, jointed, round, sheathed, almost naked below, smooth, succulent; flowers small, white, terminating, from six to eight, on very short pedicels, which are clustered, thickened, and unequal; they gradually erect themselves as they flower, and are again turned back as the flowers go off; petals a little bigger than the calix.—Native of the southern parts of Jamaica, in mountain-woods; flowering in spring months: found also in Guiana.

5. Tradescantia Discolor; *Purple-leaved Spiderwort.* Stemless, even: bractes equitant, compressed; leaves lanceolate, coloured underneath. Root perennial, vertical, fleshy, knotty; stalks axillary, four times shorter than the leaves, solitary, erect, simple, rarely divided, a little compressed, smooth, whitish; flowers numerous, between the uppermost external bractes, which they scarcely rise above, separated and enfolded in distinct clusters by the internal ones, pedicelled, white, short-lived, and scentless.—Native of South America, on the Mosquito shore, whence it was brought by a ship to Jamaica. It is now very common in our stoves, flowering early in the day throughout the summer.

6. Tradescantia Malabarica; *Grass-leaved Spiderwort.* Erect, even: peduncles solitary, very long. It flowers in July and August.—Native of the East Indies.

7. Tradescantia Nervosa; *Nerve-leaved Spiderwort.* Scape one-flowered; stems a hand high, diffused; flowers large.—Supposed to be a native of Suratte.

8. Tradescantia Divaricata; *Straddling Spiderwort.* Stem dichotomous; leaves ovate-lanceolate, smooth; sheaths villose; flowers panicled; filamenta smooth. Root perennial; stems rising to the height of ten feet, supporting themselves on the neighbouring bushes; branches round, divaricating, broken in at bottom, jointed; joints two inches and more, gradually shorter upwards, smooth below, little villose above, sheathed; petals equal, ovate, acute, longer than the calix, blue.—Found on the banks of rivers in Guiana and Cayenne, also in Trinidad, flowering almost the whole year.

9. Tradescantia Geniculata; *Knotted Spiderwort.* Procumbent, hirsute; leaves ovate, shaggy at the base and sheath. Plant tender, with herbaceous, round, jointed stems, creeping at bottom, otherwise nearly upright; flowers small, white, in loose divaricated panicles.—Native of South America and Martinico, in hedges.

10. Tradescantia Monandra; *One-stamined Spiderwort.* Diffused: leaves ovate, acuminate; peduncles axillary, many-flowered; flowers one-stamined. Root annual; radicles very long, whitish; stems herbaceous, ascending, jointed, putting out fibres half a foot long, round, pellucid, smooth, spotted; flowers minute, white, in little axillary umbels.—Native of mountain-woods in the western parts of Hispaniola.

11. Tradescantia Multiflora; *Many-flowered Spiderwort.* Erect, branched; leaves cordate, ciliate on the edge and sheaths; peduncles clustered, axillary; flowers three-stamined. Stem herbaceous, somewhat jointed, round, striated, smooth; petals less than the calix, or equal to it, ovate, white, caducous.—Native of Jamaica, in mountainous woods.

12. Tradescantia Cordifolia; *Heart-leaved Spiderwort.* Creeping, filiform: leaves cordate; peduncles terminating, solitary, many-flowered. A small, herbaceous, annual plant; radicles numerous, whitish; stem tender, sheathed, jointed at the base, round, succulent; branchlets short, coming out below the sheaths of the leaves, depressed, ascending, rooting; flowers minute, white, transient.—Native of Jamaica, in moist shady grassy parts of high mountains, flowering in autumn.

13. Tradescantia Procumbens; *Trailing Spiderwort.* Stem procumbent, rooting; leaves ovate, ciliate at the base, sheathing; peduncles cymed, axillary; stamina unequal. Perennial.—Native of the Caraccas.

14. Tradescantia Axillaris; *Axillary Spiderwort.* Stem branched; flowers sessile, lateral; corolla one-petalled, funnel-form, of a deep blue-purple; tube twice as long as the calix; segments three, shorter, blue; filamenta with jointed hairs. Annual.—Native of the East Indies, where cattle are very fond of it.

15. Tradescantia Formosa; *Handsome Spiderwort.* Leaves opposite, connate; stem a foot high, even, woolly under the joints; flowers in several remote whorls; petals six, outer three, lanceolate, more rigid.—Native of the Cape.

16. Tradescantia Cristata; *Crested Spiderwort.* Creeping, even: spathes two-leaved, imbricate. Root annual; stems round, even, branched, diffused, creeping; petals ovate, sessile, blue. It flowers from July to September.—Native of Ceylon.

17. Tradescantia Papilionacea; *Papilionaceous Spiderwort.* Creeping, even; spathes three-leaved, imbricate. Root annual, fibrous; stems three inches long, jointed, rooted at the joints; corolla violet-coloured.—Native of the East Indies.

18. Tradescantia Tuberosa; *Tuberous-rooted Spiderwort.* Root tuberous; joints of the stem radical; bractes in two rows, falcate, ciliate; leaves on the stem linear-lanceolate, sheathing, striated, under side tinged with purple, downy; flowers one in the axil of each bracte, small, blue-purple.—Native of moist valleys on the coast of Coromandel.

19. Tradescantia Paniculata; *Panicled Spiderwort.* Stems creeping; panicle terminating, many-flowered. Root fibrous, annual; flowers small, blue; corolla three-parted, the two upper divisions large and ovate, the third lanceolate.—Native of the coast of Coromandel.

20. Tradescantia Rosea; *Rosy-flowered Spiderwort.* Plant erect; leaves linear-gramineous, very long; peduncles elongate, umbelled, with few flowers; flowers rose-coloured, small, but very handsome; calices glabrous.—Grows in the wet sandy fields of Carolina and Georgia.

Tragia; a genus of the class Monœcia, order Triandria.—Generic Character. *Male Flowers. Calix:* perianth three-parted; segments ovate, acute, flat spreading. *Corolla:* none. *Stamina:* filamenta three, length of the calix; antheræ roundish. *Females,* on the same plant. *Calix:* perianth five or six parted; leaflets ovate, concave, acute, permanent. *Corolla:* none. *Pistil:* germen roundish, three-grooved; style single, erect, longer than the calix; stigma trifid, spreading. *Pericarp:* capsule tricoccous, roundish, three-celled, hispid, each cell marked on the outside at the base with two dots. *Seeds:* solitary, globular. Essential Character. *Male. Calix:* three-parted. *Corolla:* none. *Female. Calix:* five-parted. *Corolla:* none. *Stigma:* trifid. *Capsule:* tricoccous, three-celled. *Seeds:* solitary.—— The species are,

1. Tragia Volubilis; *Twining Tragia.* Leaves cordate, ovate, acuminate; stem twining. The stem is round, hairy, leafy, branched, twining from east to west; branches filiform,

all directed one way, simple; racemes peduncled, axillary, solitary, longer than the leaves, filiform, loose, composed of numerous very small male flowers, on very short pedicels, and females at the base, pedicelled, solitary, larger.—Native of the East and West Indies. It is very common in Jamaica, and is well known there on account of its sharp stinging hairs, with which the whole plant is covered. The root is looked upon as a good aperient and diuretic, for which purposes both the expressed juice and the decoction are sometimes used among the natives.—*Propagation and Culture.* Sow the seeds on a hot-bed early in the spring: when the plants are in a proper state, transplant each into a hot-bed of tanner's bark, treating them in the same way as other tender plants which require the protection of the bark-stove.

2. Tragia Cordifolia; *Heart-leaved Tragia.* Leaves cordate; stem twining; female bractes five-leaved, pinnatifid; spikes terminating. The preceding species differs from this, this having the leaves grossly serrate, and the bractes entire. —Found in Arabia Felix.

3. Tragia Involucrata; *Involucred Tragia.* Leaves ovate, pointed, serrate, hispid; stem climbing; segments of the female calix pinnatifid, bristly. Root annual; stem twining, rising to the height of ten feet, much branched, leafy, round, densely covered with pale bristly hairs.—Native of the East Indies, in sandy ground.

4. Tragia Mercurialis; *Ovate-leaved Tragia.* Leaves ovate, pointed, serrate; spikes panicled; stem erect.—Found in the East Indies.

5. Tragia Urens; *Stinging Tragia.* Leaves lanceolate, obtuse, somewhat toothed. Annual, flowering in August.— Native of Virginia.

6. Tragia Chamælea; *Lance-leaved Tragia.* Leaves lanceolate, obtuse, quite entire; stem erect, divided into long erect branches; root annual, very slender, fibrous, blackish; seeds oblong, ash-coloured.—Native of the East Indies.

7. Tragia Cannabina; *Hemp-leaved Tragia.* Leaves three-parted; stem erect, round, hispid; peduncles lateral, solitary, one-flowered, length of the leaves.—Native of Malabar.

8. Tragia Corniculata; *Horn-fruited Tragia.* Leaves subcordate-ovate, attenuated, almost quite entire; valves of the capsules two-horned. Root annual, fibrous; stem herbaceous, erect, a foot and half high, hairy, round; branches alternate, spreading, simple.—Found in the island of Trinidad, and Guiana.

9. Tragia Macrocarpa; *Large-fruited Tragia.* Plant climbing, hispid; leaves deeply cordated, ovate, acutely dentate, hispid.—Discovered by Michaux in Kentucky. Annual; flowering in July.

10. Tragia Nepetifolia; *Nep-leaved Tragia.* Leaves oblong-cordate, serrated, hispid; stem erect, much branched. An annual herbaceous plant, a foot high; leaves alternate, an inch long; clusters axillary and terminal.—Native of New Spain, flowering in August.

Tragopogon; a genus of the class Syngenesia, order Polygamia-Æqualis.—Generic Character. *Calix:* common, simple, eight-leaved; leaflets lanceolate, equal, alternately interior, all united at the base. *Corolla:* compound, imbricate, uniform; corollets hermaphrodite, many, exterior ones a little longer; proper one-petalled, ligulate, truncate, five-toothed. *Stamina:* filamenta five, capillary, very short; antheræ cylindrical, tubulous. *Pistil:* germen oblong; style filiform, length of the stamina; stigmas two, revolute. *Pericarp:* none; calix converging, acuminate, length of the seeds, ventriculose, at length reflexed. *Seeds:* solitary, oblong, attenuated to both ends, angular, rugged, terminated by a long, awl-shaped, down-bearing stipe. *Down:* feathered, flat, with about thirty-two rays. *Receptacle:* naked, flat, rugged. Essential Character. *Calix:* simple. *Down:* feathered. *Receptacle:* naked. These plants are propagated by seeds, which should be sown in April upon an open spot of ground, in rows about nine or ten inches' distance; and when the plants are come up, they should be hoed out, leaving them about six inches asunder in the rows. The weeds should also be carefully hoed down as they are produced, otherwise they will soon overbear the plants and spoil them. This is all the culture required; and if the soil be light, and not too dry, the plants will have large roots before winter; at which time the *Salsafie*, the roots of which are then eaten, will be fit for use, and may be taken up any time after their leaves begin to decay, but when they begin to shoot again, they will be sticky and not fit for use, though many persons cultivate this species for the shoots. Some people, in cultivating these plants, sow their seeds in beds pretty close, and, when they come up, transplant them out in rows at the before-mentioned distance; but as they form a tap-root which abounds with a milky juice, when the extreme part of their roots is broken by transplanting, they seldom thrive well afterwards: hence it is the best way to make shallow drills in the ground, and scatter the seeds therein, as before directed, whereby the rows will be at a due distance; and there will be nothing more to do than to hoe out the plants when they are too thick in the rows, which will be much less trouble than the other method of transplanting; and the plants will be much larger and fairer. The common Yellow sort, the shoots of which are sold in the market, will be fit for use in April or May, according to the forwardness of season. The best time to cut them is, when their stems are about four inches long; for if they stand too long, they are not so tender. A few plants should be suffered to run up to stalk every spring, to produce seeds.——The species are,

1. Tragopogon Pratensis; *Common Yellow Goat's Beard.* Calices nearly equal to the ray of the corollas; leaves entire, keeled, acuminate, dilated at the base; peduncle round. Root biennial, fleshy, tapering, abounding with milk, which is sweet, not acrid; whole herb smooth and very even; stems several, branched, eighteen inches or two feet high, leafy, round, often tinged with purple; branches elongated into a simple naked peduncle; flowers yellow, large and handsome, opening at day-break, and closing before noon, except in cloudy weather. Gærtner remarks, that the receptacle is at first flat, but becomes a little convex. He describes the seeds as very long, fusiform, club-shaped, striated, smooth or rugged, with acute dots, whitish, ending in the stipe; the seed-down white, and caducous; the rays chaffy, unequal, the length of the stipe, which is of a subulate setaceous form, solid, and nearly equal to the seed in length. Before the stems shoot up, the roots, boiled like Asparagus, have the same flavour, and are nearly as nutritious. Villars relates, that the children in Dauphiny universally eat the stems and leaves of the young plants before the flowers appear; and that the fresh juice of these tender herbs is the best dissolvent of the bile; and that both animals and children invite us to make use of this remedy, which relieves the stomach without danger, and without introducing into the blood an acrid corrosive stimulant, as is frequently done by salts, soaps, and resins, when employed for this purpose. In some parts of England it is called *Buck's Beard*, from the German; and *Jack Go-to-bed-at-noon*, from the circumstance of the flowers closing about mid-day. It is also named *Joseph's Flower*, from the Dutch, and *Star of Jerusalem.* It flowers in June; and though a native of Siberia, is not uncommon among the grass in Great Britain.

2. Tragopogon Mutabilis; *Changeable Goat's Beard.* Calices eight-leaved, equalling the ray of the corolla; leaves entire, stiff, lanceolate, acuminate. Root biennial. The whole plant smooth and milky; stem round, upright, branched at all the axils from the very root; flowers spreading very much, nodding towards the sun; they open nearly at sun-rise, and close again about ten o'clock, and so continue for three days, during which the florets successively expand; corollas five-lined, five-toothed, for the most part white on both sides; but some are rose-coloured, with red streaks, others yellow, with purple streaks, and different shades; hence the trivial name *Mutabilis*, or Changeable.—Native of Siberia.

3. Tragopogon Undulatus; *Wave-leaved Goat's Beard.* Calices equalling the ray of the corolla; leaves entire, sublinear, those on the stem waving very much. Root fusiform, biennial, the thickness of a finger; stem erect, from four to seven feet high, clothed with a short wool, which falls off, and it is then smooth; corollets sulphur-coloured on both sides, often paler; antheræ brownish; styles yellow.—Found in the meadows of Tauria.

4. Tragopogon Orientalis; *Oriental Goat's Beard.* Calices shorter than the ray of the corolla; leaves entire, somewhat waved.—Native of the Levant.

5. Tragopogon Major; *Great Yellow Goat's Beard.* Calices longer than the ray of the corolla; leaves tapering, straight; peduncles thickened at top; corollets rounded at the end. Root biennial, long, tapering or round, fusiform, that and the whole plant abounding with a sweet milky juice, which soon turns to a brown resin, from the evaporation of its watery particles.—Native of meadows, vineyards, &c. in Germany, Austria, and Switzerland, flowering in August.

6. Tragopogon Porrifolius; *Purple Goat's Beard*, or *Salsafie.* Calices half as long again as the ray of the corollas; leaves entire, stiff; peduncle thickened at top. Herb smooth, glaucous, about four feet high; stem round, erect, branching, leafy; flowers solitary, terminating, of a violet-purple, with black anthers; the stalk, which supports them, tapering from the calix downwards. Mr. Woodward remarks, that the leaves on the stem are shorter than in the Pratensis, being scarcely longer than the internodial spaces. The flowers, as Dr. Smith observes, close early in the day. It is cultivated in gardens, and known by the name of *Salsafie:* the roots, when boiled or stewed, have a mild, sweetish flavour. Some persons cultivate it for the stalks, which are cut in the spring, when they are four or five inches high, and dressed like Asparagus.—Native of many parts of Europe, flowering in May and June. Though not very general in England, it is often found in upland pastures. Gerarde says, that it grew only upon the banks of the river Chalder, near Whalley in Lancashire. It has been since observed in Cornwall; in the fields about Carlisle, and Rose Castle, in Cumberland; in the marshes below Woolwich, and near Edmonton; also in the meadows below St. Vincent's rocks, Bristol.

7. Tragopogon Crocifolius; *Crocus-leaved Goat's Beard.* Calices longer than the ray of the corolla; leaves entire; root-leaves and peduncles villose at the base; flowers violet, of two rows only, but in the middle rather yellow. Biennial.—Native of Italy, and the south of France.

8. Tragopogon Villosus; *Hairy Goat's Beard.* Calices half as long again as the ray of the corolla; stem and leaves villose; root biennial. The whole plant is pubescent, with white villose hairs. Flowers pale yellow, when expanded drooping a little.—Native of Spain and Siberia.

9. Tragopogon Dalechampii; *Great-flowered Goat's Beard.* Calices one-leafed, shorter than the corolla, unarmed; leaves runcinate. Root perennial, thick, and succulent: stems about a foot high, sometimes less; florets large, pale yellow above, red or purple underneath. From the centre of the root-leaves, which spread in a rose, rises a naked thick flower-stalk, villose and thicker in the upper part, where it terminates in a very large flower, of a pale yellow or sulphur-colour. It flowers from June to October.—Native of Spain, the south of France, and Barbary.

10. Tragopogon Picroides; *Prickly-cupped Goat's Beard.* Calices one-leafed, shorter than the corolla, prickly; leaves runcinate, toothletted. Stems hollow, tender, a little branched; flowers yellow; seeds joined on one stipe, terminated by another, as in the preceding species, Gouan remarks, that in shady places it varies, like the Sowthistle, with the leaves entire or runcinate, the root-leaves often obovate and entire, the stem scarcely branched, and low, so that it might be easily taken for the Asper; but it differs manifestly in having the stem-leaves always dilated at the base. It flowers in July and August.—Native of the south of Europe.

11. Tragopogon Asper; *Rough Goat's Beard.* Calices shorter than the corolla, hispid; leaves entire; stem-leaves oblong. This varies very much in open exposed situations, so as to assume the appearance of a different species. Annual: flowering in July and August.—Native of Montpellier.

12. Tragopogon Dandelion; *Dandelion Goat's Beard.* Leaves ensiform, entire, even; scapes radical; seed-down hairy.—Native of Virginia.

13. Tragopogon Lanatus; *Woolly Goat's Beard.* Leaves ensiform, waved, villose; scapes radical.—Native of Palestine.

14. Tragopogon Virginicum; *Virginia Goat's Beard.* Radical leaves lyrate, rounded; stem-leaves undivided; stems almost naked, upright, stiff, with one or two lanceolate embracing leaves on them, and few branches; florets deep yellow; calix divided into twelve leaves to the base, equal, shorter than the corolla.—Native of North America.

Trailing Arbutus. See *Epigœa.*

Trapa; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four-parted, acute, permanent, growing to the base of the germen; leaflets two, lateral, and two at the angles of the germen. *Corolla:* petals four, obovate, larger than the calix. *Stamina:* filamenta four, length of the calix; antheræ simple. *Pistil:* germen ovate, two-celled; style simple, length of the calix; stigma headed, emarginate. *Pericarp:* none. *Seed:* nut ovate-oblong, one-celled, armed with two or four spines in the middle of the side, opposite, spreading, (which were the leaves of the calix,) acute, thick. Essential Character. *Calix:* four-parted. *Corolla:* four-petalled. *Nut:* armed with four opposite spines, which were the leaves of the calix.——The species are,

1. Trapa Natans; *Four-horned Water Caltrops.* Nuts four-horned; spines spreading. Root round, fibrous, very long, brown, putting forth a long, cylindrical, floating stem, varying in length according to the depth of the water, furnished with numerous, opposite, pectinated tufts of fibrous radicles, gradually diminishing to simple fibres; and at the top of the stem, which is thickened, these fibres are replaced by alternate stalked leaves, which are crowded at the summit into a large spreading star, floating on the surface of the pool, and often or twelve inches in diameter. Each leaf is rhomboid, succulent, an inch or more in breadth, veiny, strongly toothed in front, entire at the base, the veins very hairy beneath. Footstalks three or four times as long as the leaves, smooth, swelling beyond the middle into an elliptical cellular body, rendering the plant more buoyant. Flowers small, white, on short club-shaped, axillary, simple, partly hairy stalks, scarcely half an inch long; nut turbinate,

about an inch in diameter, angular, smooth, with four prominent ascending pointed horns. The nuts are esteemed to be farinaceous, nourishing, and pectoral; the skin, with the spines, being removed, there is a white sweet kernel within, somewhat like a Chestnut: they are sold in the market at Venice, under the name of Jesuit Nuts. At Vercelli they are called Galarin, and are much eaten by the children and people of the lower orders. Pliny informs us, that the Thracians made them into bread; and Thunberg, that the Japanese commonly boil the roots in broth, though the taste is by no means pleasant. Annual: flowering from June to August. —Native of ponds and muddy ditches in the south of Europe, and Asia.

2. Trapa Bicornis; *Two-horned Water Caltrops.* Nuts two-horned. They are woody, coriaceous, black, blown, inversely pyramidal, rhombed, below beautifully areolated with ribs and grooves, branched, ocellated and variously confluent, terminated at top with a four-cornered head, radiantly striated, having a round hole punched through it; armed on each side with a very thick horn, spreading horizontally, and moderately curved back: cell one, corresponding in form to the body of the nut. Though the preceding species varies with three, and even two horns, yet this is not a variety of that; for, in that the horns are always acuminate, whereas in this they are obtuse, and have quite a different appearance. —Native of ponds in China.

Traveller's Joy. See *Clematis.*

Treacle Mustard. See *Clypeola.*

Tree, Celandine. See *Bocconia.*

Tree, Germander. See *Teucrium.*

Tree, Mallow. See *Lavatera.*

Tree, Primrose. See *Oenethera.*

Trefoil. See *Trifolium.*

Trefoil, Stinking Bean. See *Anagyris.*

Trefoil, Bird's-Foot. See *Lotus.*

Trefoil, Marsh. See *Menyanthes.*

Trefoil, Moon. See *Medicago.*

Trefoil, Shrubby. See *Ptelea.*

Trefoil, Snail. See *Medicago.*

Trefoil, Strawberry. See *Trifolium.*

Trefoil, Thorny. See *Fagonia.*

Tremella; (so called by Dillenius, on account of its gelatinous, tender, and tremulous substance;) is a genus of the class Cryptogamia, order Fungi, according to Persoon, but Algæ, according to Linnæus. This genus appears to be made up of various gelatinous productions, in which no traces of fructifications have been detected. Having no shields, tubercles, or warts, they could not be referred to *Lichen*, or its allies; neither have they seeds imbedded throughout their substance, to make them *Ulvæ;* much less any aggregated seeds, with or without a perceptible pericarp, as in *Fucus.* Essential Character. *Fructification:* scarcely perceptible, in a membranous, gelatinous, expanded, undulated substance.— Although authors of the first authority have collected together upwards of twenty species of this supposed genus, we shall content ourselves by referring the curious reader to Persoon for the specifications, as they really seem to be mere gummy exudations, caused by immoderate wet, accompanied by resinous particles insoluble in water, which give them a powdery appearance.

Trewia; a genus of the class Polyandria, order Monogynia, or rather of the class Dicœcia, order Polyandria.—Generic Character. *Calix:* perianth three-leaved; leaflets ovate, reflexed, coloured, permanent. *Corolla:* none, unless the calix be taken for it. *Stamina:* filamenta numerous, capillary, length of the calix; antheræ simple. *Pistil:* germen superior; style simple, length of the stamina; stigma simple. *Pericarp:* capsule turbinate, three-sided, crowned, three-celled, three-valved. *Seeds:* solitary, convex on one side, angular on the other. Essential Character. *Calix:* three-leaved, superior. *Corolla:* none. *Capsule:* tricoccous.——The only known species is,

1. Trewia Nudiflora. Leaves on long round petioles, a span and more in length, and almost two hands wide, oblong, ovate-cordate, attenuated at the point, thin and soft, dusky-green on the upper surface, but brighter on the lower; flowers on round pale-green peduncles, axillary, of an herbaceous colour, void of smell. This is a lofty tree, with a trunk as thick as a man can embrace, covered with an ash-coloured bark.—Native of the East Indies.

Trianthema; a genus of the class Decandria, order Digynia. —Generic Character. *Calix:* perianth five-leaved; leaflets oblong, coloured within, mucronate below the tip, permanent. *Corolla:* none, unless the calix, formed of a calix and corolla together, be so called. *Stamina:* filamenta ten, in some five to twelve, capillary, length of the calix; antheræ roundish. *Pistil:* germen rather superior, oblongish, retuse; style one or two, filiform, length of the germen, hispid on one side; stigmas simple. *Pericarp:* capsule oblong, truncate, retuse, cut round; cells, two superior, and two inferior. *Seeds:* solitary, or two, subovate. *Observe.* The number of stamina and styles in distinct species is different. Linnæus remarks, that there is scarcely any genus more irregular than this. Essential Character. *Calix:* mucronate below the tip. *Corolla:* none. *Stamina:* five or ten. *Germen:* retuse. *Capsule:* cut round.——The species are,

1. Trianthema Monogyna. Flowers five-stamined, one-styled; stem with a hairy line along the upper side. It sends out many trailing branches, which lie flat on the ground, spreading two feet or more each way, and having much the appearance of Purslain; with fleshy succulent oval leaves. The flowers come out from the joints of the stalks, and are somewhat of a purple colour, and are succeeded by capsules having two horns, with one cell enclosing eight or ten seeds. —It grows naturally in most of the West India islands, and is often a troublesome weed there. Sow the seeds upon a good hot border in the spring; and when the plants are fit to remove, plant them on another hot-bed, to bring them forward, without which they will not ripen. In June they may be transplanted into a warm border, where they will grow until the frost in autumn kills them.

2. Trianthema Crystallina. Flowers five-stamined, one-styled, heaped; leaves oval; stem herbaceous; flowers alternate, small. Root perennial; stem depressed, a span long, reddish, branched, leafy, clothed with pellucid, papillary granulations.—Native of Arabia, and the East Indies.

3. Trianthema Pentandra. Flowers five-stamined, two-styled; leaves obovate. Stem a foot high, round, erect, somewhat rugged; calix bell-shaped, five-parted, purplish within, permanent; segments lanceolate.—Native of Arabia.

4. Trianthema Fruticosa. Shrubby, ten-stamined, one-styled: filamenta anther-bearing; branches spreading, jointed; joints a little thickened at top, dotted with brown, ash-coloured below; flowers terminating; the branchlets four or five, sessile, with pellucid bractes interposed between them. —Found in the kingdom of Tunis.

5. Trianthema Humifusa. One-styled: leaves lanceolate; stem frutescent, round.—Native of the Cape.

6. Trianthema Anceps. One-styled: leaves lanceolate; stem frutescent, ancipital.—Native of the Cape.

7. Trianthema Decandra. Flowers ten-stamined, two-styled; stem herbaceous, diffused alternately; leaves oppo-

site, petioled, elliptic, quite entire, smooth; petioles membranaceous on each side; flowers axillary, on short peduncles.—Native of the East Indies.

Tribulus; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, acute, a little shorter than the petals. *Corolla:* petals five, oblong, obtuse, spreading. *Stamina:* filamenta ten, awl-shaped, very small; antheræ simple. *Pistil:* germen oblong, length of the stamina; style short and thick; stigma headed. *Pericarp:* roundish, prickly, of five or ten capsules, gibbous on one side, often armed with three or four dagger-points, angular on the inner edge, converging, with transverse cells. *Seeds:* many, turbinate, oblong. *Observe.* The first species has ten wrinkled fruits, without lateral spines. Essential Character. *Calix:* five-parted. *Petals:* five, spreading. *Style:* conical. *Capsules:* five or ten, gibbous, spiny, many-seeded.——The species are,

1. Tribulus Maximus; *Great Caltrops.* Leaves about four-paired; outer leaflets larger; pericarpia ten-seeded, awnless; flowers axillary; petals large, yellow. It is an annual plant, with pretty thick, compressed, channelled stalks, which trail upon the ground, and are nearly two feet long. The flowers have an agreeable odour, and are succeeded by roundish prickly fruit, ending in a long point. Browne says, this plant grows in all the pastures of Jamaica, and is frequently gathered with other fodder plants, and fed upon indiscriminately by all sorts of cattle.—This, with the second and fourth species, being natives of hot countries, and very tender, must be propagated by seeds sown upon a hot-bed early in the spring. When the plants come up, transplant each into a separate pot, filled with rich light earth, plunge them into the tan-pit, and treat them in the same manner as other tender exotic plants, being careful to bring them forward as early as possible in the summer.

2. Tribulus Lanuginosus; *Woolly Caltrops.* Leaves about five-paired; leaflets almost equal; seeds two-horned; stems ascending, long, round, hairy, jointed; peduncle from the alternate axils, or that of the smaller leaf.—Native of Ceylon.

3. Tribulus Terrestris; *Small Caltrops.* Leaves six-paired, almost equal; seeds four-horned. Root slender, fibrous, annual; from which spring four or five slender stalks, spreading flat on the ground, they are hairy, and extend two feet and a half in length; flowers axillary, on short peduncles, composed of five broad obtuse yellow petals. They appear in June and July, and are succeeded by roundish five-cornered prickly fruit, which, when ripe, divides into five cells, each containing one or two seeds, which ripen in August and September.—Native of most of the hot and temperate parts of the world; as the south of Europe, Barbary, Siberia, the coast of Coromandel, China, Cochin-china, and the West Indies. Browne says, it is common about Kingston in Jamaica; being planted there, in many gardens, for the sake of its flowers, which have an agreeable smell. Poultry are observed to feed much upon this plant, which is thought to fatten them, and to heighten their flavour: it is there called *Turkey Blossom.* The English name *Caltrops,* is taken from the form of the fruit, which resembles the machines that are cast in the way to obstruct an enemy's cavalry.—Sow the seeds in autumn, on an open bed of fresh light earth, where they are designed to remain, for they do not bear transplanting very well. In the spring, carefully clear them from weeds, and thin them where they come up too close. In June they will begin to flower, and their seeds will ripen in August and September. If the seeds be permitted to scatter, the plants will come up in the following spring, and maintain their place, unless overpowered by the weeds.

4. Tribulus Cistoides; *Cistus-flowered Caltrops.* Leaves eight-paired; leaflets almost equal. Root perennial, woody; from which spring out many hairy, jointed, trailing stalks, nearly two feet long; peduncles axillary, hairy, nearly two inches long, sustaining one pale yellow flower, composed of five large petals with narrow tails, but very broad and roundish at their points; fruit roundish, armed with very acute spines.—Native of meadows in South America, and the West Indies. It will live through the winter, if plunged in the bark-stove: in the following summer it will flower earlier, and there will be more time for the seeds to ripen.

Tricera; a genus of the class Monœcia, order Tetrandria.—Generic Character. Umbel simple, with the male florets peduncled, and a female in the middle sessile; involucre none. *Male. Calix:* perianth one-leafed, four-parted to the base; segments lanceolate, acute, erect, permanent, coloured. *Corolla:* none. *Stamina:* filamenta four, erect, longer than the calix, ovate; antheræ sitting on the top of the filamenta, lanceolate, acute, channelled in the middle, after flowering recurved. *Female. Calix:* perianth five-leaved; leaflets ovate acute, erect, coloured. *Corolla:* none. *Pistil:* germen ubtrigonal; styles three, short, roundish, conical, after flowering bipartite; stigmas linear, longer than the styles, recurved, patulous, channelled, permanent. *Pericarp:* capsule oblong, trigonal, three-horned, three-celled, three-valved. *Seeds:* in pairs, oblong, obtuse. Essential Character. *Male. Calix:* four-parted. *Corolla:* none. *Stamina:* fleshy. *Filamenta:* ovate. *Female. Calix:* five-leaved. *Corolla:* none. *Styles:* conical. *Capsule:* three-horned, three-celled, three-valved.——The species are,

1. Tricera Lævigata. Leaves on short round petioles, opposite, distich, ovate-lanceolate, acute, convex, quite entire, veined above, marked with lines at the edge, veinless beneath, stiffish, very smooth; flowers whitish, in simple, axillary, opposite umbels; the common peduncle four-cornered, three times shorter than the leaves. A branching shrub, two or three feet high; its branches long and spreading, smooth, leafy, and obscurely quadrangular.—Native of Jamaica, in mountain-coppices in the western parts of the island; flowering in the spring.

2. Tricera Citrifolia. Leaves ovate-oblong, pointed, triple-ribbed, veiny on both sides; clusters axillary. A shrub fifteen feet high, branched, with a pale gray bark, and hard yellow wood.—Found in the Caraccas.

3. Tricera Cordifolia. Leaves elliptical, obtuse, veiny, somewhat heart-shaped at the base; flowers in lateral tufts. A shrub with round gray branches.—Native of the West Indies.

Trichilia; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, mostly five-toothed, short. *Corolla:* petals five, lanceolate, spreading; nectary cylindrical, tubular, with a ten-toothed mouth, shorter than the petals, connate, of ten filamenta. *Stamina:* filamenta none; antheræ ten, erect, rising from the margin of the tube of the nectary, deciduous. *Pistil:* germen subovate, subtrilobate; style short; stigma headed, three-toothed. *Pericarp:* capsule roundish, subtrigonal, three-celled, three-valved. *Seeds:* solitary, berried. Essential Character. *Calix:* mostly five-toothed. *Petals:* five. *Nectary:* toothed, cylindrical, bearing the antheræ at the top of the teeth. *Capsule:* three-celled, three-valved. *Seeds:* berried.——The species are,

1. Trichilia Hirta. Leaves pinnate; leaflets fewer, elliptic, acuminate, smooth; racemes clustered. Trunk twenty feet high, straight, covered with an almost smooth grayish or light brown bark, with some white spots in it. The ends of

the twigs are branched into several green stalks, two inches long, which just at the bottom are branched into others sustaining several whitish-green flowers with purple-headed stamina.—Native of Jamaica, found in abundance between Passage Fort and St. Jago de la Vega.——The trees and shrubs of this genus, being natives of hot countries, cannot be preserved in England, except in a stove. They may be propagated by seeds sown in pots, and plunged into a hot-bed: when the plants are fit to remove, plant each in a separate small pot, and shade them until they have taken new root. They may also be increased by cuttings during any of the summer months. Plant them in a dry gravelly soil.

2. Trichilia Spondioides. Leaves unequally pinnate, subhirsute; pinnas numerous, the lower ones larger; racemes axillary. Stem ten feet high or more, upright, divided into very few branches; leaves a foot long; flowers inodorous, small, about thirty in a raceme; calix half five-cleft, spreading, flat, very small; petals whitish, spreading; fruit round, first green, then purplish, when ripe as large as a great garden pea, breaking into three membranes, expanding themselves, each having a crest or rising in the middle, and shewing three almost triangular distinct kernels, covered over with a thin scarlet pulp.—Native of Jamaica, St. Domingo, and Carthagena; flowering there principally in November.

3. Trichilia Emetica. Leaves pinnate, villose underneath; leaflets elliptic; branches villose, round; flowers corymb-panicled, greenish-yellow, twice as large as in the preceding species. Forskall describes this as a large tree, with alternate downy branches: the Arabs call it *Roka*. The flowers resemble orange-blossoms; and the fruit, mixed with perfumes, is used by the women for washing their hair. The ripe seeds are made into an ointment with oil of Sesamum, as a remedy for the itch.—Native of Arabia Felix, where it is found upon the mountains.

4. Trichilia Glabra. Leaves pinnate, smooth; outmost leaflets larger; racemes axillary, very short; capsules globular, green. It is a tall branching tree, with an unpleasant fetid smell.—Native of the Havannah, in mountain woods.

5. Trichilia Pallida. Leaves unequally pinnate, membranaceous; racemes axillary and terminating; flowers eight-stamined; capsules two-valved. This is a tree of about twelve or fifteen feet high, smooth, and branchy; branches horizontal; petals pale or whitish.—Native of the West Indies, flowering in February or March.

6. Trichilia Moschata. Leaves alternately pinnate; racemes axillary; flowers subdecandrous, one-petalled; capsules one-seeded. This is a tree twenty feet high; branches subdivided, with a smooth striated bark.—Native of Jamaica, where it is called Muskwood, on account of the smell of the plant when rubbed.

7. Trichilia Spectabilis. Leaves pinnate; leaflets obovate; racemes axillary, compound.—Native of New Zealand.

8. Trichilia Alliacea. Leaves pinnate: leaflets lanceolate, acute; racemes axillary, superdecompound.—Native of the island of Namoka.

9. Trichilia Heterophylla. Leaves pinnate or ternate; leaflets ovate, acuminate; racemes axillary; flowers eight-stamined; stigma club-shaped. This is between a shrub and a tree, or may be called either; bark gray, variegated by fissures.—Native of Madagascar.

10. Trichilia Trifoliata. Leaves ternate; leaflets obovate, shining. A tree fifteen feet high, exhaling from every part a disagreeable, through not powerful odour; branches numerous, round, irregular, spreading, often from the very ground; flowers small; calix bell-shaped, erect; petals whitish, erect, three times as long as the calix. In Curaçao it is called *Kerse-boom*, or Cherry-tree, although it has nothing in common with that. The negresses use a decoction of the roots to procure abortion.—Native of Curaçao in dry pastures, flowering in April and May.

11. Trichilia Nervosa. Leaves ternate; leaflets ovate, acute, their ribs hairy beneath. Branches villose, tomentose at the end; flowers in short panicles, clustered, with a lanceolate leaflet at the base of each; corolla villose, twice as long as the calix.—Native of Java.

12. Trichilia Spinosa. Leaves simple, ovate, emarginate; branches thorny.—Native of the East Indies.

Trichocarpus; a genus of the class Polyandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, four or five parted; segments ovate, acute, spreading, permanent. *Corolla:* none. *Stamina:* filamenta very many, sixty to seventy, capillary, longer than the calix, inserted into the receptacle; antheræ small, roundish. *Pistil:* germen ovate, villose; styles two, longer than the stamens, bifid at the top; stigmas obtuse. *Pericarp:* capsule ovate, four-cornered, one-celled, four-valved, bristly; bristles long, rigid, deciduous. *Seeds:* numerous, small, fastened to a free ovate-oblong receptacle involved in a viscid membrane. Essential Character. *Calix:* four or five parted. *Corolla:* none. *Styles:* two, bifid. *Capsule:* bristly, one-celled, four-valved, many-seeded.——The only species is,

1. Trichocarpus Laurifolia. Leaves scattered, coriaceous, oblong, acute, quite entire, veined, smooth, petioled; corymbs few-flowered, subdichotomous, lateral. This tree is about fifty feet in height, and grows on the banks of rivers in Guiana, flowering and fruiting in November.

Trichomanes; a genus of the class Cryptogamia, order Filices.—Generic Character. *Fructifications:* inserted into the margin of the frond, separate. *Involucre:* one-leafed, urn-shaped, undivided, opening outwards. *Columns:* extending beyond the involucre like styles. *Observe.* Habit membranaceous, semitransparent. For the propagation and culture of this genus, which principally consists of stove-plants, see *Acrostichum* and *Adiantium.*——The species are,

* *With a simple Frond.*

1. Trichomanes Membranaceum. Fronds simple, oblong, lacerated; stalk flat, black, covered with hair, applying itself to rocks, trees, or stones, and rising seven or eight feet high, putting out, at a greater or less distance, small, roundish, membranaceous, yellowish-green leaves. They grow sometimes longer, having incisures on their edges. The plant looks somewhat like a Moss.—Native of South America and Jamaica, in wet places.

2. Trichomanes Pusillum. Fronds simple, linear, gashed; shoot creeping.—Native of Jamaica.

3. Trichomanes Crispum. Fronds pinnatifid, lanceolate; pinnas parallel, subserrate.—Native of Martinico.

4. Trichomanes Reptans. Fronds cuneate, ovate, gash-pinnatifid; shoot creeping.—Native of Jamaica.

5. Trichomanes Asplenioides. Fronds pendulous, lanceolate, pinnatifid, very smooth; segments two-lobed; lobes obtuse; fructifications two-valved.—Native of Jamaica.

6. Trichomanes Polypodioides. Fronds lanceolate, pinnatifid, repand; flowers solitary, terminating.—Native of the East Indies.

** *With a compound Frond.*

7. Trichomanes Crinitum. Fronds subpinnate, hairy; pinnas ovate, pinnatifid; segments bifid; subdivisions blunt; fructifications bristle-bearing, on an upright rough-haired stipe.—Native of Jamaica, on the trunks of trees.

8. Trichomanes Lucens. Fronds bipinnatifid, pendulous, lanceolate, hirsute, shining; pinnas parallel; segments round-

ish, subserrulate; stipe extremely hirsute.—Native of Jamaica.

9. Trichomanes Hirsutum. Fronds pinnate; pinnas alternate, pinnatifid, hairy; fructifications solitary in the notches of the pinnules.—Native of America, Japan, &c.

10. Trichomanes Sericeum. Fronds bipinnatifid, pendulous, lanceolate, tomentose; pinnas alternate; segments linear, obtuse, entire, the lower ones bifid; fructifications terminating, hirsute.—Native of Jamaica.

11. Trichomanes Pyxidiferum. Fronds subbipinnate; pinnas alternate, clustered, lobed, linear.—Native of America.

12. Trichomanes Tunbrigense; *Hare's-foot Fern.* Fronds pinnate; pinnas oblong, dichotomous, decurrent, toothed. Root slender, wiry, spreading very far, throwing out fibres here and there, and producing upright fronds, which, when dried up in summer, curl backwards: their substance is extremely membranous and pellucid, appearing finely reticulated under a microscope; their segments linear, obtuse, sharply serrate, and having a strong simple central rib. The fructifications, when they occur, take place of the first segment of each pinna, or general division of the frond, each terminating its appropriate nerve, and pointing upwards. The involucre is of two slightly concave valves, arising from the substance of the leaf, irregularly notched, and serrate on the margin. Between these is a short column, beset with small round bivalve capsules, each embraced with an elastic ring, as in the more common Ferns. The bivalve involucre and short column, so distinct from the urn-shaped undivided involucre, and long column or style, of the true Trichomanes, induced Dr. Smith to establish a new genus under the name of *Hymenophyllum*, or Filmy Leaf. Several other species here enumerated belong properly to that genus.—There are two varieties of this species, one with the fructifications on naked footstalks: the first was found under Dolbadon castle near the lake of Llanberis, and on the rock called Foal Foot, on Ingleborough, Yorkshire; the other variety was found at Belbank, near half a mile from Bingley.—This species was first discovered near Tunbridge, in the moist clefts of rocks and stony places; also upon Buzzard Rough Crag, near Wrenose, Westmoreland; near Settle in Yorkshire; among the pebbles at Cockbush on the coast of Sussex; and upon Dartmoor in Devonshire; and various other places.

13. Trichomanes Adiantoides. Fronds pinnate; pinnas ensiform, acuminate, gash-serrate; serratures bifid; stem upright, single, firm, smooth, purplish.—Native of the East Indies, and of Africa.

14. Trichomanes Fucoides. Fronds bipinnatifid, ovate, smooth; pinnas ovate; segments two-parted; subdivisions serrate, obtuse; fructifications two-valved, inserted above the base of the pinnas.—Native of Jamaica.

15. Trichomanes Ciliatum. Fronds erect, bipinnatifid, deltoid; pinnas ovate; segments linear, obtuse, ciliate; fructifications terminating, bivalved, rough-haired; stipe margined.—Native of Jamaica.

16. Trichomanes Lineare. Fronds subbipinnate, pendulous, lanceolate, smooth; leaflets remote; pinnules linear, two-parted; fructifications terminating, two-valved; stipe capillary.—Native of Jamaica.

17. Trichomanes Strigosum. Frond bipinnate; pinnules rhombed, hairy, serrate; fructifications solitary below the serratures; stipe tomentose, strigose.—Native of Japan.

**** With a superdecompound Frond.*

18. Trichomanes Undulatum. Fronds tripinnatifid or bipinnatifid, pendulous, lanceolate; leaflets and pinnas alternate, decurrent; segments linear, retuse, crenulate, waved; fructifications terminating, two-valved.—Native of Jamaica.

19. Trichomanes Scandens. Fronds superdecompound; leaflets alternate; pinnas alternate, oblong, serrate; stalk not quite so large as a goose-quill, roundish, black, covered towards the top with a ferruginous moss, and having very many filamenta or clavicles, by which it takes firm hold of the bark of trees, and rises to fifteen or twenty feet high, turning itself round; pinnules long, deeply cut in on the edges, very thin, pellucid, of a yellowish-green colour, having some dark opaque ribs running through them, and a woolly hair on them; fructifications at the end of the segments in a little cup.—Native of America; and common in Jamaica.

20. Trichomanes Chinense. Frond superdecompound; leaves and pinnas alternate, lanceolate; segments of the pinnas wedge-shaped; root scarcely villose; stipe smooth, somewhat channelled in front, but with a blunt edge.—Native of China.

21. Trichomanes Rigidum. Fronds four times pinnatifid, erect, deltoid; leaflets spreading; pinnas lanceolate; segments linear, gashed at the end; fruit-bearing cups pedicelled, axillary.—Native of Jamaica.

22. Trichomanes Polyanthos. Fronds four times pinnatifid, deltoid, erect; pinnas and pinnules decurrent; segments linear, obtuse; fructifications two-valved, numerous; stipe margined.—Native of Jamaica.

23. Trichomanes Clavatum. Fronds four times pinnatifid, oblong-lanceolate, loose; pinnas and pinnules decurrent; segments linear, emarginate; fructifications terminating, two-valved, roundish; stipe roundish.—Native of Jamaica.

24. Trichomanes Canariense. Fronds superdecompound, three-parted; leaflets alternate; pinnas alternate, pinnatifid. -- Found in the Canaries, and in Portugal.

25. Trichomanes Japonicum. Fronds superdecompound; pinnules gash-trifid, acute.—Native of Japan, upon the mountains; flowering from September to March.

26. Trichomanes Capillaceum. Fronds superdecompound; pinnas filiform, linear, one-flowered.—Native of S. America.

27. Trichomanes Aculeatum. Frond superdecompound, scandent, very much branched; leaflets palmate; segments linear, obtuse; stipe prickly.—Native of Jamaica.

Trichosanthes; a genus of the class Monœcia, order Syngenesia.—Generic Character. *Male Flowers. Calix:* perianth one-leafed, club-shaped, very long, smooth; mouth five-toothed, reflexed, small. *Corolla:* one-petalled, five-parted, growing to the calix, flat, spreading; segments ovate-lanceolate, ciliate, with very long branching hairs. *Stamina:* filamenta three, very short, at the top of the calix; antheræ five, combined into a cylindrical erect body, covered on all sides with a fariniferous line, creeping up and down. *Pistil:* styles three, very small, growing to the tube of the calix. *Females,* on the same plant. *Calix:* perianth as in the male, superior, deciduous. *Corolla:* as in the male. *Pistil:* germen oblong, slender, inferior; style filiform, the length of the calix; stigmas three, oblong, awl-shaped, gaping. *Pericarp:* pome oblong, three-celled; cells remote. *Seeds:* many, compressed, obtuse, coated. Essential Character. *Calix:* five-toothed. *Corolla:* five-parted, ciliate. *Male. Filamenta:* three. *Female. Style:* trifid. *Pome:* oblong.——The species are,

1. Trichosanthes Anguina; *Snake Gourd.* Fruit cylindrical, elongated, incurved; leaves heart-shaped, lobed, wavy, with little pointed teeth. This is an annual plant; the stalks run to a great length, trailing upon the ground like Cucumbers and Melons. The leaves are angular and rough. The flowers come out from the side of the stalk, are white, and cut into many small threads. The fruit is taper, and upwards of a foot long, of a dark shining green, and often marked with white, and has the appearance at first sight, as it lies on the

ground, of a large snake. It flowers in May and June.—Native of China and Cochin-china. Sow the seeds on a hot-bed early in the spring, and treat the plants in the same way as Cucumbers and Melons.

The other species of *Trichosanthes* are, Scabra, Fœtidissima, Nervifolia, Caudata, Cucumerina, Amara, Tricuspidata, Pilosa, Tuberosa, and Laciniosa, all natives of hot countries.

Trichostema; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth one-leafed, two-lipped; upper lip twice as large, trifid, equal, acute; lower two-parted, acute. *Corolla:* one-petalled, ringent; tube very short; upper lip compressed, sickle-shaped, lower three-parted, the middle segment very small, oblong. *Stamina:* filamenta four, capillary, very long, curved in, two of them a little shorter; antheræ simple. *Pistil:* germen four-cleft; style capillary, length and figure of the filamenta; stigma bifid. *Pericarp:* none; calix larger, reflexed, so that the upper lip becomes the lower, ventricose, converging. *Seeds:* four, roundish. Essential Character. *Corolla:* upper lip sickle-shaped. *Stamina:* very long. *Calix:* two-lipped.——The species are,

1. Trichostema Dichotoma. Stamina very long, standing out; leaves rhomboid-lanceolate; flowering-branches twice forked. The leaves are small, roundish, not unlike those of Sweet Marjoram, and covered with small fine downy hairs; flowers axillary, small, purple, appearing late in August, whence, except in warm seasons, the seeds will not ripen in England. It is an annual plant, rising about six or eight inches high, dividing into small branches. The whole plant has an agreeable resinous scent.—Native of Virginia and Pennsylvania. Sow the seeds of this, and the following species, in autumn, in pots filled with light earth: in winter place the pots under a frame, to shelter them from severe frost; but expose them to the open air when the weather is mild. In the spring, transplant them to a bed of light earth; shading them from the sun till they have taken new root, and keep them clean from weeds.

2. Trichostema Brachiata. Stamina short, included; leaves ovate-lanceolate; flowering-branches opposite, panicled. Stalk herbaceous, branching, nearly a foot high. The leaves are a little hairy, and sessile, shaped like those of the Wild Marjoram. The flowers are produced at the top of the branches; they are small, and of a purple colour, and appear too late to ripen seeds often.—Native of Virginia.

3. Trichostema Spiralis. Stamina very long, spiral; leaves ovate-acute. Stem herbaceous, four feet high, erect, with opposite crossing branches. Flowers pale violet, in long terminating spikes.—Native of Cochin-china.

Trichostomum; a genus of the class Cryptogamia, order Musci. Essential Character. *Capsule:* oblong. *Fringe:* of thirty-two capillary, straightish teeth, approximated or united in pairs.——The following are the principal species:

* *All the Teeth of the Fringe distinct at the base.*

1. Trichostomum Trifarium; *Three-ranked Fringe Moss.* Leaves lanceolate, or awl-shaped, in three rows, keeled, entire; capsule ovate; stem branched.—Found at Clapham springs near Bedford, and occurring generally on high barren ground.

2. Trichostomum Capillaceum; *Capillary Fringe Moss.* Leaves capillary, in two rows, sheathing and dilated at the base; capsule elliptic-cylindrical; lid conical; stems very densely tufted.—Found upon mountain-bogs in the north of Great Britain, also in Switzerland and Sweden.

3. Trichostomum Papillosum; *Papillary Fringe Moss.* Leaves awl-shaped, keeled; capsule elliptical, nearly erect, gibbous on the lower side at the base; lid conical; stem branched.—Native of turfy bogs in the Highlands of Scotland.

** *Teeth of the Fringe connected in pairs at the base.*

4. Trichostomum Lanuginosum; *Toothed Hoary Fringe Moss.* Leaves lanceolate, with a pellucid toothed point; capsule ovate; stem procumbent, branched in a pinnate manner.—This species is very frequent in dry mountainous woods, and on exposed rocks, stones, walls, or heaths, bearing capsules, though rarely, in autumn.

5. Trichostomum Ericoides; *Heath-like Hairy Fringe Moss.* Leaves ovate-lanceolate, recurved, keeled, and deeply channelled, with a pellucid finely serrated point; capsule ovate; stem erect, with very short branches.—This is one of the scarcest and most elegant of the genus, and first found upon Snowden in Wales.

6. Trichostomum Canescens; *Common Hoary Fringe Moss.* Leaves ovate-lanceolate, with a central channel, but no nerve, and a pellucid rough point; capsule ovate; stem erect, with upright branches.—This is almost universal in mountainous and maritime situations.

7. Trichostomum Fasciculare; *Beardless Hoary Fringe Moss.* Leaves lanceolate, pointed, revolute, keeled; capsule ovate-oblong; stem branched, diffuse.—Found upon dry rocky mountains in the north, bearing plenty of capsules in the spring.

8. Trichostomum Glaucescens; *Glaucous Fringe Moss.* Leaves linear-lanceolate, acute, rather glaucous; capsule ovate, slightly furrowed; stem erect, somewhat branched.—Native of Sweden and Scotland.

9. Trichostomum Lineare; *Linear-leaved Fringe Moss.* Leaves linear-lanceolate, imbricated, acute; capsule elliptical; lid conical, oblique; stem erect.—Native of Scotland, Wales, and Northumberland, in wet places.

10. Trichostomum Fontinalioides; *River Fringe Moss.* Leaves lanceolate; capsules ovate, nearly sessile at the ends of the lateral shoots; stem floating, very much branched.—Found on the Ouse at Oakley in Bedfordshire, in the Isis at Oxford, and the Thames near Lambeth, firmly attached to walls or stones under water, their numerous tufted branched leafy stems, four or five inches long, floating with the stream.

Tridax; a genus of the class Syngenesia, order Polygamia-Superflua.—Generic Character. *Calix:* common cylindrical, imbricate; scales ovate-oblong, sharpish, erect. *Corolla:* compound radiate; corollets hermaphrodite, tubular, in the disk; female in the ray: proper in the hermaphrodites funnel-form, five-toothed, erect; in the females ligulate, three-parted; segments equal, the middle one narrower. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* in the hermaphrodites, germen oblong; style bristle-shaped, length of the stamina; stigma obtuse: in the females, germen oblong; style filiform, length of the corolla; stigma obtuse. *Pericarp:* none; calix unchanged. *Seeds:* in the hermaphrodites solitary, oblong; down many-rayed, simple, a little longer than the calix: in the females very like the other. *Receptacle:* chaffy, flat; chaffs lanceolate, shorter than the seed. Essential Character. *Calix:* imbricate, cylindrical. *Corollets* of the ray: three-parted. *Down:* many-rayed, simple. *Receptacle:* chaffy.——The only known species is,

1. Tridax Procumbens. Leaves placed in pairs, rough, hairy, about an inch and half long, and three-quarters of an inch broad, ending in acute points, and acutely jagged on the edges. The flowers are produced upon long naked peduncles, which terminate the branches. The florets are of a pale copper colour, inclining to white; stalks trailing, and emitting roots at the joints, herbaceous and hairy.—Found near Vera Cruz in America. Sow the seeds in pots plunged

into a hot-bed. When the plants are fit to remove, put each into a small pot filled with light earth; plunge the pots into the tan-pit; shading them from the sun till they have taken new root, and then treating them in the same way as other tender plants from the West Indies, placing them in autumn in the bark-stove, where they should constantly remain. As it rarely perfects seeds here, it may be increased by planting pieces of the stalks, which put forth roots at the joints.

Trientalis; a genus of the class Heptandria, order Monogynia.—Generic Character. *Calix:* perianth seven-leaved; leaflets lanceolate, acuminate, spreading, permanent. *Corolla:* stellate, flat, one-petalled, equal, seven-parted, very slightly cohering at the base; segments ovate-lanceolate. *Stamina:* filamenta seven, capillary, inserted into the claws of the corolla, patulous, length of the calix; antheræ simple, recurved. *Pistil:* germen globular; style filiform, length of the stamina; stigma headed. *Pericarp:* berry capsular, juiceless, globular, one-celled, covered with a very thin crust, opening by various sutures. *Seeds:* some, angular; receptacle very large, hollowed out for the seeds. Essential Character. *Calix:* seven-leaved. *Corolla:* seven-parted, equal, flat. *Berry:* juiceless.——The species are,

1. Trientalis Europæa; *Chickweed Winter-green.* Leaves clustered, spreading, lanceolate, quite entire, smooth, veined; peduncles terminating, aggregate, one-flowered, spreading; flowers snow-white, very elegant. Root perennial; stem solitary, simple, erect, four or five inches high, almost naked, except at the top.—Native of the northern parts of Europe, of Canada, and Siberia, in woods on the side of mountains, and upon turfy heaths.

2. Trientalis Americana. Leaves narrow, lanceolate, acuminate, oblique; flowers white.—Grows in cedar-swamps and other sphagnous places on high mountains, from Canada to Virginia. This delicate little plant, Pursh observes, differs considerably from the European sort. Michaux and Nuttall consider it to be the same, the latter of whom denominates it a variety of Trientalis Europæa.

Trifolium; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, tubular, five-toothed, permanent. *Corolla:* papilionaceous, commonly permanent, shrivelling; banner reflected; wings shorter than the banner; keel one-petalled, shorter than the wings. *Stamina:* filamenta diadelphous, simple, and nine-cleft; antheræ simple, roundish. *Pistil:* germen subovate; style awl-shaped, ascending; stigma simple, smooth. *Pericarp:* legume scarcely longer than the calix, one-valved, not opening, deciduous. *Seeds:* very few, roundish. Essential Character. *Calix:* tubular, five-cleft. *Keel:* simple, shorter than the wings and banner. *Stigma:* smooth. *Legume:* scarcely longer than the calix, not opening, deciduous.——The species are,

* *Melilots. Legumes naked, many-seeded.*

1. Trifolium Cœruleum; *Blue Melilot Trefoil.* Racemes ovate; legumes half naked, mucronate; stem erect; spikes oblong. Root annual, fibrous; stem two or three feet high, smooth, angular, leafy, scarcely branched. Leaves ternate, with ovate leaflets, slightly serrate, standing upon pretty long footstalks: the flowers are collected in oblong spikes, which stand upon very long stalks, springing from them at every joint of the stalk the whole length of it; they are of a pale blue colour, and shaped like those of the Common Melilot: they appear in June and July, and the seeds ripen at the beginning of September. The whole plant has a very strong scent, like that of Fenugreek, and perishes soon after the seed becomes ripe.—Native of Germany, in dry barren ground. If the seeds of this and the seven following species, which are annual plants, be permitted to scatter, they will rise without care, and require no other culture but to be kept clean from weeds, and to be thinned where they grow too close.

2. Trifolium Indicum; *Indian Melilot Trefoil.* Clusters cylindrical; legumes racemed, naked, one-seeded; stem erect. This has the appearance of the first species, but is more slender, only two feet high, and upright; branches from the axils shorter; flowers white or yellow, but so small that their parts can scarcely be distinguished by the naked eye. There are several varieties, which can hardly be distinguished.—Native of the East Indies, China, Africa, and Italy.

3. Trifolium Massanense; *Sicilian Melilot Trefoil.* Legumes racemed, naked, one-seeded, low, striated, semiovate, acute; stems decumbent; peduncles axillary, shorter than the leaf; flowers small, yellow; raceme headed.—Native of Sicily, Italy, and Barbary.

4. Trifolium Polonicum; *Polish Melilot Trefoil.* Legumes racemed, naked, two-seeded, lanceolate; stem erect. This differs from the next species, in having the stalk altogether round; the leaves smaller, acuminate, acutely serrate at top; the flowers in the raceme remote, and on longer pedicels; the peduncles round, not grooved; the banners of the flowers folded back, with the wings not outwardly and longitudinally converging at their edges, but obliquely divaricating; the legumes two-seeded, little wrinkled, lanceolate, acuminate, longer. The stature and smell are the same; the flowers are of a pale yellow colour. It flowers here from June to August.—Native of Poland.

5. Trifolium Officinale; *Common Melilot Trefoil.* Legumes racemed, naked, two-seeded, wrinkled, acute; stem erect. Root annual, strong, woody; stem branched, two or three feet high, angular and furrowed; leaves ternate, petioled, alternate; leaflets smooth, lanceolate, obovate, or the lower ones oblong, wedge-shaped, the upper elliptical; they vary indeed much in form, and are commonly serrate, but sometimes nearly entire: flowers small, drooping, varying in colour, but with us almost always of a golden colour: they grow in long, peduncled, axillary spikes, very close together, on short capillary pedicels, each having a small awl-shaped bracte. There cannot be a worse weed than this among bread-corn, for a few of the seeds ground with it spoil the flour, by communicating their peculiarly strong taste. Notwithstanding its strong smell and bitter acrid taste, it does not appear to be disagreeable to any cattle, and horses are said to be extremely partial to it. Bees are very fond of the flowers. The whole plant has a peculiar scent, which becomes more fragrant in a dry state, then having some resemblance to that of Anthoxanthum. The flowers are sweet; a water distilled from them possesses little odour in itself, but improves the flavour of other substances. In medicine it was esteemed emollient and digestive, and was used in fomentations and cataplasms, particularly in blister-plasters; but is now laid aside, as being rather acrid and irritating than emollient.—It grows wild in most parts of Europe, in cornfields, pastures, and by way-sides.—The *White Siberian Melilot*, which Linneus considered as a variety of this species, has been recommended by some French writers as food for cattle. It grows in Siberia, in deep dry light land, and rises from three to nine feet in winter, but shoots again early in spring, and lasts from two or three to six years. It begins to flower about the middle of June, and is in full bloom by the middle of July. The stems and leaves are twice as large as those of the common sort, though the flowers, which are constantly white, are but half the size. It has been sown for

twenty years by the side of Common Melilot in the Paris garden, without varying. Sown in the field on a light soil, but wet, it grew above eight feet high, and produced a great quantity of feed; it was given to cattle both green and dry, and they preferred it to every other food, especially when fresh cut. In a loose dry soil it will rise to six feet high, and in such land may be sown in autumn upon one earth, but in wet land it is safer to sow it in spring, at which time the land must have two earths, and be well broken with the harrow. The seed being smaller than that of Clover, and the plant spreading more, half the quantity of seed usually sown of Clover will be sufficient. If sown in autumn, it may sometimes be mown in November: the first cuttings may be made into hay, but the last must be given to cattle green. By means of regular cutting, it may be preserved several years; but if left to ripen its seed, soon becomes weak, and may be considered as a biennial. When cultivated by itself, it seems to be more productive than Clover, but the produce becomes much more considerable when cultivated with the Siberian Vetch; for these plants possess all the qualities which can make their union desirable: they last the same time; shoot at the same period; flower and seed together; extend their roots to different depths: one produces a thin and tender food, the other more solid and substantial; and the warm quality of the one is tempered by the aqueousness of the other.

6. Trifolium Italicum; *Italian Melilot Trefoil.* Legumes racemed, naked, two-seeded, wrinkled, obtuse; stem erect; leaflets entire; flowers small, yellow, in racemes. It flowers from June to August.—Native of Italy, Barbary, &c.

7. Trifolium Creticum; *Cretan Melilot Trefoil.* Legumes racemed, naked, two-seeded, membranaceous; stem nearly upright; flowers pale yellow, in racemes, nodding. It flowers from June to August.—Native of Candia, and of Algiers.

8. Trifolium Ornithopodioides; *Bird's-foot Melilot Trefoil.* Legumes naked, eight-seeded, about three together, twice as long as the calix; stems declined. Root fibrous, with small fleshy knobs, which appear to be designed for enabling it to resist accidental drought during summer; peduncles axillary, much shorter than the leaf-stalks, bearing usually two, but sometimes one, three, or even four slender pale red flowers, growing parallel to each other.—Native of Denmark, France, and Britain, on dry gravelly heaths and pastures, and among short grass; flowering in June and July. Its small size, and prostrate position, have probably caused it it to be thought more rare than it really is. It has been found among corn half a mile from Tadcaster towards Sherborn; also near Oxford; on the sandy banks by the sea-side near Tolesbury in Essex; and on Blackheath; also on Mousehold heath near Norwich; about Mazarion and Penzance in Cornwall; and at Maitland Bridge, between Musselburgh and Edinburgh.

** *Lotoid: Legumes covered, many-seeded.*

9. Trifolium Lupinaster; *Bastard Lupine Trefoil.* Heads halved; leaves quinate, sessile; legumes many-seeded. Root perennial; stems several, from a foot to eighteen inches in height, round, with seven or eight joints, green or purplish. There are usually several heads at the end of the stem, of a roundish form, with the flowers pretty thickly set; corolla purple. The circumstance of having more than three leaflets, usually five, is sufficient to distinguish this species. It flowers in July and August.—Native of Siberia.

10. Trifolium Reflexum; *Reflex-headed Trefoil.* Fruiting heads bent back; legumes three-seeded; leaves downy. Flowers of a fine purplish red.—Native of Virginia.

11. Trifolium Strictum; *Upright Trefoil.* Heads globular; legumes two-seeded; calices length of the corollas; leaflets serrulate; stipules rhombed. Root annual; stem erect, branched at bottom, patulous, even; corolla very small.—Native of Italy and Spain, in pastures.

12. Trifolium Hybridum; *Mule Trefoil.* Heads umbelled; legumes four-seeded. Stem ascending; root perennial; peduncles not very long, but yet jointed as in the species next following; corollas gaping.—Native of several parts of Europe.

13. Trifolium Repens; *Creeping White Trefoil,* or *Dutch Clover.* Heads umbelled; legumes four-seeded. Stem creeping; root perennial, fibrous; leaves on long petioles; flowers many, as far as sixty in a close head, very large in the cultivated plant, and of a round shape; each flower is on a short pedicel, and has a small awl-shaped bracte; corolla white or tinged with purple, permanent. The flowers stand upright till they are withering, and then hang down. It is doubtful at what time this plant first came into cultivation in this country. On all our good lands it seems to arise spontaneously, but is nevertheless much encouraged by the spreading of ashes or other manure. It does not come early, neither is it of a tall growth; but it forms an excellent bottom in pastures, and produces great abundance of succulent stalks and leaves, affording late feed in dry summers when most of the grasses are burnt up.—It is common in pastures throughout the greatest part of Europe; flowering from the end of May to September. There are many varieties, depending on richness or poverty of soil. Two of them are remarkable; one with leaves of a deep purple colour, cultivated in gardens as an ornamental plant; the other proliferous, or having small heads of leaves growing out of the flowers. In a moist fertile soil it acquires a more upright branching stem, but still remains sufficiently distinct from the preceding species. —*Propagation and Culture.* The seed of this plant is annually imported from Flanders by way of Holland, from whence it received the name of Dutch Clover; not that it is any more a native of that country than of this, but because there they collect the seeds in larger quantities, which might be done here if the same care were taken with this species as is bestowed upon the Red Clover sort: it would well repay every farmer that would sow an acre or two with the White Clover seeds, by saving the expense of purchasing, and by the sale of any quantity he may have to spare. It is an abiding plant, with branches trailing on the ground, and sends out many roots from every joint; which thicken, and make the closest sward of any of the sown Grasses, and is the sweetest feed for all sorts of cattle yet known: therefore when land is designed to be laid down for pasture, with intent to be continued so, there should always be a quantity of the seeds of this plant sown with the Grass-seeds. The usual allowance is eight pounds to one acre of land, but it should never be sown with corn; for if there be a crop of corn, the grass will be so weak under it as to be scarcely worth standing: yet such is the covetousness of farmers, that they will not be prevailed on to alter their old custom of laying down their grounds with a crop of corn, though they lose twice the value of their corn by the poorness of the grass, which never will come to a good sward, and one whole season is also lost; for if this seed be sown in the spring without corn, there will be a crop of hay to mow by the middle or latter end of July, and a much better after-feed for cattle in the following autumn or winter, than the grass which is sown with the corn will produce the second year. The seeds of this sort may also be sown with Grass-seeds in autumn, in the manner hereafter directed for the Common Red Clover; and this autumnal sowing, if the seeds grow kindly, will afford a good early crop of hay, in the following spring; and if, after the hay is taken off the land, the ground

be well rolled, it will cause the Clover to mat close upon the ground, and form a thick sward.

14. Trifolium Comosum; *Tufted Trefoil.* Heads globular, umbelled, imbricate; banners bent down, permanent; legumes four-seeded. Flowers small, white.—Native of America.

15. Trifolium Alpinum; *Alpine Trefoil.* Heads umbelled; scape naked; legumes two-seeded, pendulous; leaflets linear-lanceolate. Root very large, perennial, running deep into the ground; stems very short, herbage smooth; flowers on a scape or naked stem, two or three inches in length, purple or bright red.—Native of the Alps, Pyrenees, and Monte Baldo. It flowers from June to August. It is called *Reglissedes Alpes*, from the taste of the roots, and because it is used instead of Liquorice in the Alps.

**** Lagopuses; with villose Calices.*

16. Trifolium Subterraneum; *Subterraneous Trefoil.* Heads villose, four-flowered or thereabouts, with a central, reflexed, rigid, stellate involucre, wrapping up the fruit. Root annual, fibrous, furnished with knobs; stems prostrate, about three inches in length, or longer, spreading close to the ground, almost concealed by the broad, pale purple-veined, sheathing stipules of numerous leaves; peduncles bearing three or four flowers, at first erect, but before the fruit ripens they are bent to the ground, producing from the extremities little white thick fibres, star-like at the tips, which become recurved and rigid, enveloping the fruit: these look so like roots, that till Mr. Curtis explained their economy, they were supposed to be roots; and Dillenius, aware that the plant, being an annual, did not propagate itself by these supposed roots, conjectured they might draw moisture to nourish the seed. The long, slender, milk-white petals, render this species conspicuous, though, when first seen, they are seldom taken for the flowers of a Trefoil.—Native of France, Italy, Spain, and England, in exposed gravelly situations, and particularly on heaths, as Blackheath, &c.; Hyde Park, and Greenwich Park, where its flowers are visible among the short grass, in May, and through the summer, till August. It also occurs between Eltham and Deptford in Kent; upon the Bath hills; near Bungay, in Suffolk; at Gamlingay, and near White-wood, Cambridgeshire; upon Mangotsfield common, near Bath; in the Salt Marsh, at Lymington; on Shotover-hill, by the road to Cuddesdon, Oxfordshire; and at Ampthill and Clophill, Bedfordshire.

17. Trifolium Globosum; *Globular Trefoil.* Heads villose, globular; upper calices destitute of a floret. Root annual; stems filiform, a foot long, decumbent: the lower florets only corolled and fertile; the rest mutilated, and drying away into a woolly substance, fill the head, bend back to the sides, and conceal the fertile calices.—Native of Arabia, &c.

18. Trifolium Cherleri; *Hairy Pink Trefoil.* Heads villose, globular, terminating, solitary; calix very hairy, with taper teeth; stems procumbent; leaves obcordate. This is allied to the next species. Flowers dense, heaped; corolla small, shorter than the calix. It flowers in May and June.—Native of France, Italy, and Algiers.

19. Trifolium Lappaceum; *Burr Trefoil.* Spikes subovate, toothed; calicine teeth setaceous, hispid; stem patulous; leaves, ovate. An annual plant, with a dense tuft of branching, leafy, quadrangular, variously spreading stems, a foot high; heads many-flowered, terminal, stalked.—Native of France, Spain, and Italy.

20. Trifolium Rubens; *Long-spiked Trefoil.* Spikes villose, long; corollas one-petalled; stem erect; leaves serrulate. The stipules, with their sheaths, are very large, in a manner covering the stalk, and are not hairy: there is usually only one spike of flowers to a stalk; but in gardens there are sometimes two; calix in reality smooth, but the teeth, having long white hairs on them, which spread very much, the whole has the appearance of being hairy; the four upper teeth are very short, but the fifth tooth is as long as the whole corolla, and at least three times as long as the other teeth; colour of the corolla dark-red purple.—Native of the south of Europe, and of Algiers in Africa.

21. Trifolium Pratense; *Common Purple Trefoil*, or *Honeysuckle Trefoil.* Spikes ovate, dense; stems ascending; corollas unequal; calicine teeth four, equal; stipules awned. Roots perennial, striking almost right down, and scarcely creeping, branching, granulated, ash-coloured; flowers many, closely imbricate, erect, having a peculiar smell; calix silky, hairy, pale, sometimes tinged with purple, with ten streaks, dark green or red, seldom brown. It is very distinct from the next species, with which it has been confounded: the root is much smaller; the stems not flexuose, in the wild plant they are lower, more procumbent, often solitary, less branched, and not unfrequently quite simple; the sheaths much larger, not ciliate, and commonly veined with red or brown; there are always two floral leaves; the leaflets are shorter, for the most part ovate, blunter, commonly spotted with white, and more indistinctly veined; the veins on the upper surface in the living plant depressed, but in the dried one raised; the spike is smaller, much less frequently peduncled or double, and not flatted at the top; the calix never quite smooth; the corolla smaller, much more unequal, for the most part of a pale purple, or at least with the wings not deeper-coloured at the end.—The cultivated Purple Trefoil, commonly known by the name of Broad Clover, is much larger and smoother than the wild plant, and has more stems; the leaflets are sharper; the spike is mostly peduncled, and not so unfrequently double; the calix is for the most part more villose, with the lower tooth longer in proportion; the banner and wings of the corolla are more diverging; the style is frequently shorter, and the legume two-seeded. Mr. Miller asserts, that he has often sown the seeds of the cultivated Red Clover, and the Wild Red Meadow Trefoil, in the same bed, and that they constantly produced the two species without varying. Red or Broad Clover has been long under culture in Flanders, and other countries on the continent of Europe, and has at length nearly surmounted the inveterate prejudices which retard its general adoption in Great Britain. Besides the principal use to which it is applied for feeding cattle, it may be mentioned, that the heads are used in Sweden to dye woollen green; with alum they produce a light, and with copperas a dark green: the seeds also yield a dye. Common Purple Trefoil varies sometimes with a white flower; a single plant has been observed with white or cream-coloured flowers.—Other varieties have been frequently offered to public notice, under the names of Cow-Grass and Marl-Grass: the former seems to differ from the Wild Broad Clover, by larger heads of flowers, and not flowering so early; the latter has its name from being the production of marl land; it bears a striking analogy to the Broad Red Clover, with this difference, that it will remain much longer in the land.—*Propagation and Culture.* Since the general cultivation of this species in England, there has been great improvement made of the clay lands, which before produced but little Rye Grass, and other coarse bents; which, by being sown with Red Clover, have produced more than six times the quantity of fodder they had formerly on the same land, whereby the farmers have been enabled to feed a much greater stock of cattle than they could before, which has enriched the ground, and prepared it for corn; and where the land is kept in tillage, it is the usual method now among the farmers, to lay down their

P. 694.

TRIFOLIUM CHERLERI.

Hairy Pink Trefoil.

P. 674.

TIGAREA TRIDENTATA.

P. 694.

TRIFOLIUM RUBENS.

Long-spiked Trefoil.

Published by Fisher Son & Cº Caxton. London. 1828

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ground with Clover, after having had two crops of corn, whereby there is a constant rotation of Wheat, Barley, Clover, or Turnips, on the same land. The Clover-seed is always sown with Barley in the spring, and when the Barley is taken off, the Clover spreads and covers the ground, and this remains two years; after which the land is again ploughed for Corn. The most approved method of sowing it, is on clean land, with a full crop of Barley after Turnips, at the rate of twelve pounds to an acre. The duration of it is very short, except on fresh land; which points out the propriety of intermixing with it as great a variety of other crops as may be suitable. On land where it has been often repeated, it seldom will continue above two years, and very often not above one; and though manure will increase the crop, it will not prolong its duration. It evidently grows most kindly after Turnips, and any soil that will bear them is consequently suitable for it; although a great quantity is now grown on strong clays with good success. A prevailing method is to mow it in June, and make it into hay. Two tons upon an acre may be reckoned a medium crop. It is particularly good for draught horses and oxen. Sometimes it is mowed a second time late in August; but the hay of this second crop is less in quantity, and of an inferior quality to the former: unless dry fodder, therefore, be greatly wanted, it is better to feed it, instead of a second mowing. When it is to be saved for seed, it is often fed down close until the end of May, (which early feed is a vast advantage for ewes, lambs, &c. as it comes in before the natural grasses:) it is a biennial plant, the roots of which decay after they have produced seeds; but, by eating it down, or mowing it when it begins to flower, the roots will be forced to produce new shoots, by which the plants are continued longer, and from these second shoots the seeds are collected. The common allowance of seed for an acre of ground, is ten pounds. In the choice of the seeds, that which is of a bright yellow colour, inclining to brown, should be preferred; and the pale-coloured thin seed should be rejected. It should be sown, according to some agriculturists, after the Barley is harrowed in, that it may not be buried too deep; and after the seeds are sown, the ground should be rolled, which will press them into the ground; but this should be done in dry weather, for moisture will often cause the seeds to burst; and, when the ground is wet, the seeds will stick to the roller. This is the method which is generally practised in the sowing of this plant with corn, but, as we have intimated under the thirteenth species, it will be much better sown alone; for the corn prevents the growth of the plants until it is cut and taken off the ground, so that one whole season is lost, and a great crop of corn often spoils the Clover, which becomes hardly worth standing; whereas, where it is sown without any other seed, the plants will come up more equally, and come on much faster, than that which was sown the spring before, under corn. About the latter end of May it will be fit to cut, when there should be great care taken in making it into hay; for it will require a great deal more labour, and time to dry, than common grass, and will shrink into less compass; but if it be not too dry, it will make very rich food for cattle. The time for cutting it is, when it begins to flower; for if it stand much longer, the lower part of the stems, and the under leaves, will begin to dry, whereby it will make a less quantity of hay, and that not so well flavoured. Some persons cut three crops of this grass in a year, but the best way is to cut but one in the spring, and feed it the remaining part of the year, which will enrich the land, and strengthen the plants; one acre of which will feed as many cattle as four or five acres of common grass: but great care should be taken of the cattle, when they are first put into it, lest it burst them: to prevent which, some turn them in for a few hours only at first, and so stint them as to quantity; and thus by degrees, suffering them to begin by eating only an hour and half a day, when there is no moisture upon the grass, and so every day suffer them to remain a longer time, until fully seasoned; but they should never be turned in to this food in wet weather; or even if they have been for some time accustomed to it, still it will be proper to turn them out at night in wet weather, and to give them hay, which will prevent the ill consequences of this food: but there are some who give straw to their cattle while they are feeding upon this grass, to prevent the ill effects of it, which must not be given them in the field, because they will neglect it, where there is plenty of better food. Others sow Rye Grass among their Clover, and suffer them to grow together, in order to prevent the ill consequences of the cattle feeding wholly upon Clover; but this is not a commendable way, because the other will greatly repress the Clover in its growth, by scattering the seeds, and filling the ground with bents.—Where the seeds are designed to be saved, the first crop in the spring should be permitted to stand until the seeds are ripe, which is about July, and may be known by the stalks and heads changing to a brown colour; then it should be cut in a dry time, and, when well dried, housed until winter, when the seeds should be threshed out: if they be wanted for immediate sowing, the crop must be well dried, otherwise they will not quit their husks. It is a common complaint, that Clover-seed requires great labour to thresh it; which is chiefly owing to the second crop being left for seed, which consequently ripens so late, that there is not heat enough to dry the husks sufficiently. This may be remedied by leaving the first crop for seed, as above, and then the ground will be ready to be ploughed for Wheat.—When cattle are fed with Clover-hay, it should be put into racks, or they will destroy most of it under their feet. It suits every kind of cattle except milch cows; though, when it is dry, it is not nearly so hurtful to them as when it is green. In short, the greatest benefit obtained from Clover is, by cutting it, while green, as often as it attains a sufficient growth, and soiling horses and cattle with it, in racks and cribs. In this manner it will support more than twice the number that might feed it off the ground; besides the additional quantity of manure that will be made in the stables and yards, if they be kept littered with straw and fern, which increase of manure will fully compensate the farmer for his expense in cutting and bringing it into the yards. The quickness of its growth, after mowing, soon enables it to shade the ground, and prevents the sun from exhaling the moisture of the land so much, as it would if fed bare; consequently it continues to spring with more vigour, and the moment one crop is removed, another begins to succeed. On the other hand, when many cattle are turned in to feed it, they frequently destroy more than they eat; and also break the necks of the roots with their feet, which prevents the plants from springing again so freely, as after they have been cut clean off by the scythe. In hot weather, which is the common season for feeding Clover, the flies are generally so tormenting to the cattle, that they are continually running from hedge to hedge, to brush them off, by which inconceivable injury is done to the crop; on the other hand, when fed in stables and yards, they are more in the shade, thrive better, and consume the whole of what is given them without waste. —The variety, *Cow-Grass*, above noticed, has been cultivated in some parts of Hampshire with great success. The ground relishes it extremely well, whence many prefer it to Common Clover, as it also grows more floridly, and thrives better upon poor land. This invaluable plant is subject to the depredations of a small insect, which appears to be the *Curculio*

Trifolii of Linneus; and is described as having a black body, with an extended beak a little longer than the thorax, which has small dots on it; the elytra, or wing-covers, are striated; the antennæ pitchy; the legs rust-coloured, the feet always black, and the thighs generally of the same colour, but the abdomen white: the length of the body is a line and half. It is called the *Clover Weevil*, and comes out early in spring, in warm pastures, and flies about till the heads of Clover beat out, when the females deposit their eggs on them. Hatched between the calices, the maggot penetrates with its head into the rudiments of the first seed, as yet in a liquid state, and then proceeds to another more advanced, and suitable to its increased strength. Having consumed three or four of them, it remains in the place of the last, where it is suffieiently sheltered, and changes into its chrysalis state, and in a few days afterwards issues forth perfected. Having taken a short meal, it then slowly conceals itself in the small holes of fences, or in the bark of trees, where it reposes during the winter. Happily the wren, red-breast, and other small birds, destroy great numbers; but the fecundity of the remainder is prodigious.

22. Trifolium Medium; *Zigzag Trefoil.* Spikes loose; stem flexuose, branched; corollas nearly equal; stipules subulate, linear. Root perennial, descending, creeping, brownish, ash-coloured; petioles unequal, the lower much longer than the stipules, the upper commonly shorter, all somewhat diverging; leaflets unequal at the beginning, and below ovate, next and in the middle oblong, finally and above almost lanceolate, and often somewhat attenuated; in the lower leaves much smaller, and very obtuse, in the rest larger and more acute, all more obscurely veined on the upper surface, more evidently on the lower. The flowers are diverging, and loosely imbricate; corolla odorous; banner scarcely longer than the wings, with a short point, and streaks of a deeper purple; wings paler, a little longer than the keel. It differs from the preceding species in its large heads of flowers, longer and narrower stipules, and more unequal calix; and from both it and the *Alpestre*, by its remarkably flexuose and zigzag stem. In a good loose soil it is said to grow more slender, and the spikes to become smaller; but it might perhaps be worth cultivating on stubborn hungry clay, like its natural soil. It flowers in July, later than the common Clover.—Native of many parts of Europe; found in Great Britain, Sweden, Denmark, Austria, Carniola, Piedmont, Holland, Switzerland, and many parts of Germany.

23. Trifolium Alpestre; *Alpine Trefoil.* Spikes dense; corollas nearly equal; stipules setaceous, diverging; leaflets lanceolate; stem stiff and quite simple. Root perennial, descending obliquely, creeping, brown; stem angular, downy, a foot high; petioles almost equal, very short, the length of the stipules, erect: flowers erect, closely imbricate; calix very villose, pale yellow, with streaks a little darker; teeth pale green, the two upper equal, and shorter than the tube of the calix; the two lower ones also equal, but a little longer than the two upper ones, and for the most part equalling the tube of the calix: the lowest as long as the tube of the corolla, twice as long as the next teeth, and sometimes longer; corolla inodorous, the whole dark purple; wings scarcely shorter than the banner, but a little longer than the keel. It is not cultivated; nor can it be recommended for that purpose, as it affords few leaves, and does not branch.—It is not a native of Britain, but occurs in dry mountainous woody places, in various parts of Germany.

24. Trifolium Pannonicum; *Hungarian Trefoil.* Spikes villose, long; corollas one-petalled; leaves quite entire; stem erect, both extremely villose; root woody, perennial, brown; flowers cream-coloured, numerous, composing an elegant, terminating, close, ovate-oblong, peduncled spike. It flowers in July and August.—Native of meadows in Lower Hungary, America, &c.

25. Trifolium Squarrosum; *Round-leaved Trefoil.* Spikes oblong, somewhat hairy; the lowest teeth of the calices reflexed; stem herbaceous, erect; root annual. It varies with oval and lanceolate leaves. Flowers here in July.—Native of Spain.

26. Trifolium Incarnatum; *Crimson Trefoil.* Spikes villose, oblong, obtuse, leafless; leaflets roundish, crenate. Stem from a foot to eighteen inches in height, erect, villose; stipules membranaceous, striated; calix villose, shorter than the corolla; teeth awl-shaped, nearly equal, feathered; corolla a little longer than the calix, red, with a long narrow obtuse banner. The flowers are sometimes found of a beautiful red, almost scarlet, but vary from a bright crimson to a perfect white. It is an hardy annual, known in our gardens, and one of the largest and most showy of the genus; flowering in July.—Native of the south of France; and of Barbary, about Algiers.

27. Trifolium Ochroleucum; *Pallid* or *Sulphur-coloured Trefoil.* Head villose; stem erect, pubescent; lowest leaflets obcordate; lowest calicine tooth very long. Root perennial, branching at top, so as to bear several stems, twelve or eighteen inches high; leaves remote, the uppermost or floral ones only opposite; stipules large, combined, embracing, sharp-pointed, downy, ribbed, with simple nerves; calix slender, furrowed, hairy, permanent, whitish; teeth bristle-shaped, the lowest twice as long as the four others, which are equal, tipped with purple, and sometimes wholly of that colour. This species is harsh, stiff, and hairy, and, not abounding in either stalks or leaves, can hardly be sought for cultivation, in preference to many superior sorts; although Mr. Curtis recommends it to the notice of the experimental agriculturist; and Mr. Miller asserts, that in some countries it has been sown in the same manner as the Common Red Clover, and produced a better crop than the latter, especially on chalky ground.—Found in dry, bushy, gravelly or calcareous pastures, from England to Constantinople, flowering in June or July.

28. Trifolium Angustifolium; *Narrow-leaved Trefoil.* Spikes villose, conic-oblong; calicine teeth setaceous, almost equal; leaflets linear. Root annual, woody, hard; stems numerous, erect, stiff, villose and silky, a foot high, branched, or sometimes simple; corollas shorter than the calix, pale or whitish, without the blood-red spot in the wings. According to Linneus, it varies in Palestine, with corollas double the size, and more deeply coloured; the lower tooth of the calix longer, and all of them straight, not bent in. It flowers from June to August.—Native of Germany, the south of France, Italy, Spain, Carniola, Barbary, and the island of Madeira.

29. Trifolium Arvense; *Hare's-foot Trefoil.* Spikes extremely villose, subcylindrical; calicine teeth setaceous, longer than the corolla; leaflets obovate, linear. Root small, annual: the whole plant villose; stem mostly erect, much branched, round, firm, changing its direction from joint to joint; leaves on short petioles; stipules lanceolate, often striated with red veins, and tapering into a bristle-like point. There is a variety found in maritime situations, the herbage of which sometimes becomes quite silky. It appears to be unfit for cultivation.—Native of Europe and Barbary, as well as of North America, in barren sandy pastures and fields; flowering in July and August.

30. Trifolium Maritimum; *Teasel-headed Trefoil.* Spikes hairy, globular; calicine teeth leafy, finally spreading; stipules lanceolate; leaflets obovate. Root annual; stems many,

spreading, often decumbent, or erect only when they grow in a tuft, varying in height, but commonly near a foot high, round, striated, a little hairy, branched; flowering-spike terminating, solitary, commonly peduncled, small, close, short, blunt, oval, or almost globular; corolla nearly equal, pale purple.—It is found in salt marshes and meadows near the sea, in various parts of England, from Norfolk, all along the south and west coast to Wales.

31. Trifolium Stellatum; *Star-headed Trefoil.* Spikes hairy; calices spreading; stem diffused; leaflets obcordate; root annual. The whole plant is villose; corolla pale rose-colour, shorter than the calix.—Native of the south of France, Carniola, and Italy.

32. Trifolium Clypeatum; *Oriental Trefoil.* Spikes ovate; calices patulous; lowest segment largest, lanceolate; leaflets ovate; root annual; colour of the plant white or silvery. It flowers in August.—Native of Italy, and the Levant.

33. Trifolium Scabrum; *Rough Trefoil.* Heads sessile, lateral, ovate; calicine teeth unequal, permanent, rigid, recurved. Root annual, small; corolla longer than the calix.—Native of several parts of Europe, as Germany, Switzerland, Carniola, the south of France, of Italy, of the hills about Algiers, in Barbary; also of Britain, where it is found occasionally on chalky ground, or in dry sandy fields that lie over a calcareous soil, flowering in May and June, and then soon dries up, and is blown about, scattering its seeds against the autumnal rains, when they produce young plants, which flower in the following spring. It occurs between Northfleet and Gravesend; near Chatham, and in the isle of Shepey; about Croydon, in Surry; on Newmarket Heath; about Chippenham and Gamlingay, in Cambridgeshire; and near Cambridge, on the Hill of Health, and near Trinity Conduit-head; near Oxford, by Jericho, on the road-side, going to Port Meadow; at Potton Sandy, and Ampthill in Bedfordshire; near Bungay, in Suffolk; on Caister Common, near Norwich; on Cromer Cliffs; on Snettisham Beach, near Wells; and in the neighbourhood of Edinburgh.

34. Trifolium Glomeratum; *Round-headed Trefoil.* Heads hemispherical, sessile, lateral, smooth; calicine teeth cordate, reflexed, veined. Root annual, small, fibrous, with oval fleshy knobs; corolla pale red or rose-coloured. It flowers about midsummer.—Native of Spain, Italy, and Barbary, about Algiers. In England it has been observed in the neighbourhood of London; about Saxmundham, in Suffolk; about Blackheath, and near Greenhithe; in the Isle of Shepey; near Norwich; on the Bath hills near Bungay, in Suffolk; and at Yarmouth. It is generally found in a moist gravelly soil.

35. Trifolium Striatum; *Soft Knotty Trefoil.* Heads sessile, lateral, and terminating, ovate; calices elliptic, hirsute, grooved; teeth setaceous; leaves downy. Root annual; corolla scarcely the length of the calix, pale purple. It flowers in June—Native of Britain, Germany, France, Spain, and Italy, in dry barren pastures. It occurs about Gamlingay, and near Cambridge; at Biddenham and Aspley, in Bedfordshire; at Jericho, Bullington Green, and Whichwood forest in Oxfordshire; and on the Bath hills, near Bungay in Suffolk.

36. Trifolium Suffocatum; *Suffocated Trefoil.* Heads sessile, lateral, roundish, smoothish; calicine teeth lanceolate, acute, recurved, longer than the corolla. Root annual, tapering, without any tuberous swellings; flowers in sessile axillary round heads; body of the calix a little hairy; teeth bent back, broad, acute, scarcely enlarged after flowering; corolla much shorter than the calix. The exclusion of light often renders the petals whitish, otherwise they are rose-coloured. It grows in the loose blowing sand of the sea-shore, beneath which its stems and flowers are often entirely buried, the leaves only peeping above the surface; to this the trivial name alludes, and hence perhaps it has been overlooked as some common species not yet in flower.—Native of Sicily and England. It flowers here in June and July, and is found on the beach at Lowestoff, Yarmouth, and Landguard fort near Harwich.

37. Trifolium Alexandrinum; *Egyptian Trefoil.* Heads oblong, peduncled; stem erect; floral leaves opposite; leaflets elliptic-lanceolate.—Native of Egypt.

38. Trifolium Uniflorum; *One-flowered Trefoil.* Stemless: peduncles trifid and subtriflorous, shorter than the stipule; pedicels long, with the flowers remote.—Native of Syria, Arabia, about Constantinople, and in Candia.

**** *Bladdery, with inflated ventricose Calices.*

39. Trifolium Spumosum; *Bladdery Trefoil.* Spikes ovate; calices inflated, smooth, five-toothed; general involucres five-leaved; stem and branches erect; corolla red; seeds four, subglobular, covered with very minute raised dots, sulphur-coloured, or deep yellow, or ferruginous. It flowers in June and July.—Native of France and Italy.

40. Trifolium Resupinatum. Spikes subovate; corollas turned upside down; calices inflated, gibbous at the back; stems prostrate. A smooth annual plant.—Native of Belgium, Silesia, and the south of France.

41. Trifolium Tomentosum; *Woolly Trefoil.* Spikes sessile, globular, tomentose; calices inflated, obtuse. Root perennial; stems decumbent all round, not creeping; corollas almost resupinate.—Native of the south of Europe, and of Barbary.

42. Trifolium Hispidum; *Shaggy Trefoil.* Heads involucred, terminating; calicine teeth setaceous, villose, shorter than the corolla; leaflets obovate.—Native of Barbary.

43. Trifolium Sphærocephalon; *Globular Trefoil.* Villose: heads roundish, involucred; segments of the calix setaceous, longer than the corolla; leaflets obcordate.—Native of Barbary.

44. Trifolium Fragiferum; *Strawberry Trefoil.* Heads roundish; calices inflated, two-toothed, reflexed; stem creeping. Root perennial, fibrous, with little tubers: corolla purple; banner longer than the wings, flat, and streaked with rose-coloured lines. The singular strawberry-like appearance of the heads, arising from the inflation of the calix after flowering, strikingly distinguishes this from the thirteenth species, to which in its general habit it is nearly allied: the whole plant also of this species is smaller, and it usually occurs in moist situations.—Native of all parts of Europe, flowering in July and August.

***** *Hop Trefoils, with the Banner of the Corolla bent in.*

45. Trifolium Montanum; *Mountain Trefoil.* Spikes subimbricate, about three; banners awl-shaped, shrivelling; calices naked; stem erect. Root perennial, running down deep; flowering heads large, ovate, obtuse; corolla white, of four distinct petals; banner lanceolate, obtuse, slightly emarginate, twice as long as the wings and keel; wings obtuse, spreading, a little longer than the keel, which is straight and obtuse. It flowers in July.—Native of many parts of Europe, on very dry hills, from Sweden to Spain.

46. Trifolium Agrarium; *Upright Hop Trefoil.* Spikes oval, imbricate; banners bent down, permanent; calices naked; stem erect. Root annual; corollas yellow, not bay-coloured: the flowers are permanent, and when dry make a rustling noise. It flowers in July.—Native of many parts of Europe, in hilly or alpine situations.

47. Trifolium Spadiceum; *Bay-flowered Trefoil.* Spikes oval, imbricate; banners bent down, permanent; calices

hairy; stem erect. This has very much the appearance of the preceding species; but the stem is more erect, and the banner of the florets becomes ferruginous after flowering.—Native of dry pastures in Sweden, and other parts of Europe.

48. Trifolium Procumbens; *Procumbent Hop Trefoil.* Spikes oval, many-flowered; banners grooved; stems procumbent; leaflets obovate; common petiole elongated at the base. Root annual, small, but strong; corolla lemon-coloured, permanent, at length brown and membranous; banner broad, furrowed, plaited.—The name of Hop Trefoil is with much propriety bestowed on this plant, the head being larger and more resembling the Hop than any of the English species. It is by no means uncommon in dry pastures on the borders of fields, and in gravelly soils. In some meadows it forms a considerable part of the crop, and makes excellent fodder. It flowers in June and July; and deserves the attention of the husbandman.

49. Trifolium Filiforme; *Slender Yellow Trefoil.* Spikes few-flowered, loose; peduncles flexuose; banners smooth; stems prostrate; all the leaflets subsessile. Root annual, small, fibrous; corolla permanent, scariose, with the banner keeled, narrower than in the preceding, neither bent in nor grooved; flowers yellow, from three to eight, drooping.—This and the next species grow naturally among grass in most of the upland pastures in this country; and the seeds of this are frequently sold in the shops by the name of Hop Clover, and are by many mixed with other sorts of Clover and Grass seeds, for laying down ground to pasture. The next species is a much smaller plant, and has trailing stalks; and the heads of flowers are smaller, and of a deeper yellow colour. As they are not abiding plants, they are not proper to be sown where the ground is designed to continue in pasture; but where one or two crops only are taken, and the land is ploughed again for corn, it may do well enough when it is mixed with other seeds, though the cattle are not very fond of it green, when it is very young. The large sort is the most profitable, but it is rarely to be had without a mixture of the small kind, and also of the Smaller Melilot, which is commonly called Nonesuch, or Black Seeds, for those who save the seeds for sale, are seldom curious enough to distinguish the sorts; but in lawns, where the beauty of the verdure is considered, none of these seeds must be sown, because their yellow heads of flowers must be unsightly among the grass; in gardens, where the grass is constantly mown, the flowers of these plants will come out near the roots, so as to occasion large unsightly yellow patches; and as the heads decay, they turn brown, and have a very disagreeable appearance. See *Medicago Lupulina.*

50. Trifolium Minus; *Small Yellow Trefoil.* Spikes in hemispherical heads; peduncles stiff; banners smoothish; stems prostrate; common petiole very short at the base. Withering says, this is the most common sort of Hop Trefoil, and may be found in almost every dry, sandy, or gravelly pasture, especially where the turf is fine, but varying greatly in size, according to the richness or poverty of the soil.

51. Trifolium Biflorum; *Two-flowered Trefoil.* Spikes two-flowered, sessile; involucre hispid, funnel-form; leaves lanceolate; stem nearly upright; flowers two, coming out alternately.—Native of Virginia and Canada.

Triglochin; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* perianth three-leaved; leaflets roundish, obtuse, concave, deciduous. *Corolla:* petals three, ovate, concave, obtuse, like the calix. *Stamina:* filamenta six, very short; antheræ as many, shorter than the corolla. *Pistil:* germen large; styles none; stigmas three, or twice as many, reflexed, feathered. *Pericarp:* capsule ovate-oblong, obtuse; cells as many as there are stigmas, opening at the base by acute valves. *Seeds:* solitary, oblong, erect. Essential Character. *Calix:* three-leaved. *Petals:* three, calix-form. *Style:* none. *Capsule:* opening at the base.——The species are,

1. Triglochin Palustre; *Marsh Arrow Grass,* or *Spiked Grass.* Capsules three-celled, even, linear, attenuated at the base; stigmas erect. Root fibrous, tufted, perennial. The most striking and certain distinction between this and the following, is, that the fruit of this is much more long and slender, having only three cells, and three valves, instead of six. All cattle will eat it, and cows are said to be extremely fond of it. —Native of Europe, Siberia, and Barbary, in boggy places; and common in England, flowering in July.

2. Triglochin Bulbosum; *Bulbous Arrow Grass.* Capsules three-celled, even, linear, attenuated at the top; stigmas spreading; root bulbous, covered with bristles heaped into a tufted bundle. The flowers and whole plant very much resemble the preceding species, but the flower and fruit are smaller.—Native of the Cape.

3. Triglochin Maritimum; *Sea Arrow Grass.* Capsules six-celled, grooved, ovate; leaves semicylindrical; root tuberous. Scape scarcely longer than the leaves, inclining at the base, terminating in a dense spike of greenish-purple flowers, on short flower-stalks.—Native of most parts of Europe, and of Siberia, in salt-marshes, and in the ooze of large rivers, where the tide flows; flowering throughout the summer. All domestic cattle being very fond of this plant, it deserves the notice of such as possess salt-marshes.

4. Triglochin Elatum. Persistent styles and capsules six; fruit angular; capsules linear, dorsely depressed, with acute margins; scape much longer than the leaves. Scape about two feet high; leaves verry narrow; stamina six, in two series; each subtended by a calix of three leaves; spike nearly a foot long.—Found in marshes in the state of New York.

5. Triglochin Triandrum. Flowers triandrous, three-cleft, short-pedicellate; capsules trigono-subrotund; leaves subsetaceous, nearly equalling the scape or spike.—Grows in overflowed marshes, near Charlestown, Carolina.

Trigonella; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, half five-cleft; toothlets awl-shaped, nearly equal. *Corolla:* papilionaceous, as it were three-petalled; banner subovate, obtuse, reflex, spreading; wings two, ovate-oblong, outwardly reflex, spreading, so that the banner with the wings constitutes, as it were, a regular three-petalled corolla; keel very short, obtuse, occupying the navel of the flower. *Stamina:* filamenta diadelphous, simple and nine-cleft, short, rising; antheræ simple, roundish. *Pistil:* germen ovate-oblong; style simple, rising; stigma simple. *Pericarp:* legume ovate-oblong, compressed, covered. *Seeds:* many, roundish. Essential Character. *Banner,* and *Wings:* nearly equal, spreading in form of a three-petalled corolla.——The species are,

1. Trigonella Ruthenica; *Small Fenugreek.* Legumes peduncled, heaped, pendulous, linear, straight; leaflets sublanceolate. Herb very smooth; stalks slender, round, leafy, trailing, extending a foot and half in length, and dividing into several branches. Biennial. It flowers in June and July. —Native of Siberia. Sow the seeds of this, and the next following eight species, where they are designed to stand, for they will not bear transplanting. If they are sown in autumn, the plants will come earlier to flower, and good seeds may be obtained with more certainty than from spring plants. All the culture they require is, to thin them where they stand too close, and to keep them clean from weeds.

2. Trigonella Platycarpos; *Round-leaved Fenugreek.* Legumes peduncled, heaped, pendulous, oval, compressed; stem diffused; leaflets roundish, sharply serrated. Root biennial, like the preceding; flowers in clusters, peduncled, axillary, small, of a yellowish-white colour, appearing in June, and seeding in September.—Native of Siberia.

3. Trigonella Striata. Legumes peduncled, nearly upright, distant; peduncles longer than the leaf, erect, awnless at the top, with five or six terminating flowers, not in a raceme, sessile, yellow. Annual.—Native of Abyssinia.

4. Trigonella Polycerata; *Broad-leaved* or *Spanish Fenugreek.* Legumes subsessile, heaped, erect, nearly straight, long, linear; peduncles awnless. Annual, the roots decaying soon after the seeds are ripe; stalks trailing, extending a foot and half in length, and sending out several side-branches; flowers in axillary clusters, small, of a pale yellow colour, sitting very close to the stalks, and appearing in July, and the seed in autumn.—Native of the south of Europe.

5. Trigonella Hamosa; *Egyptian Fenugreek.* Legumes peduncled, racemed, declined, hooked, round; peduncles spiny, longer than the leaf. Stems decumbent, ascending; flowers deep yellow, in racemes, having the banner shorter by half than the wings or keel.—Native of Egypt.

6. Trigonella Spinosa; *Thorny Fenugreek.* Legumes subpeduncled, heaped, declined, sickle-shaped, compressed; peduncles thorny, very short. Stalks rising a foot high, sending out several slender branches; flowers in clusters from the sides of the branches, upon short peduncles, which stand erect, and are armed with short spines, they are small, and of a pale colour.—Native of the island of Candia.

7. Trigonella Corniculata; *Horse-shoe Fenugreek.* Legumes peduncled, heaped, declined, somewhat sickle-shaped; peduncle long, somewhat spiny. A hardy annual; stems numerous, erect; flowers extremely sweet-scented, yellow. It flowers in June and July.—Native of the south of Europe.

8. Trigonella Monspeliaca; *Trailing Fenugreek.* Legumes heaped, sessile, bowed, divaricated, inclined, short; peduncle mucronate, unarmed. Stems prostrate, growing close to the ground; flowers very small, glomerate, sessile along the stem; leaves fan-shaped, pubescent, with a very short down, toothletted, nerved beneath, with the middle leaflet petioled. It flowers in June and July.—Native of France, Italy, and Algiers.

9. Trigonella Laciniata; *Jagged Fenugreek.* Legumes peduncled, subumbelled, elliptic; leaflets wedge-form, toothed; stipules laciniated. Stems filiform, even; peduncles axillary, scarcely the length of the leaves, terminated by a soft spinule, bearing a few yellow flowers in a sort of umbel.—Native of Egypt.

10. Trigonella Fœnum-Græcum; *Common Fenugreek.* Legumes sessile, strict, nearly erect, somewhat sickle-shaped, acuminate; stem erect, annual, hollow, herbaceous; leaflets oblong, oval, indented on their edges, on broad furrowed footstalks. The flowers come out singly at each joint from the axils, they are yellow, white, or pale blue, and sit very close to the stalk. The whole plant has a strong odour: the seeds are sometimes as many as eighteen, rhomboid, gibbous, beaked, with a depressed line, yellow or saffron-coloured. The seeds are brought to us from the south of France and Germany, where they are annually sown for exportation. The wild plant differs, in having long runners next the root, all pressed close to the ground, the stem only being upright; leaflets obovate, not obtusely lanceolate; with the joints of the leaves purple; legumes more hairy. The seeds of Common Fenugreek have a strong disagreeable smell, and an unctuous farinaceous taste, accompanied with a slight bitterishness. An ounce renders a pint of water thick and slimy. To rectified spirits they give out the whole of their distinguishing smell and taste, and afterwards to water a strong flavourless mucilage. They are never given internally, their principal use being in cataplasms and fomentations, for softening, maturing, and discussing tumours, and in emollient clysters. Grooms and farriers use them for horses.—Native of the south of Europe.—*Propagation and Culture.* The ground in which this plant thrives best is a light hazel loam, not enriched with dung; this should be freed from the roots of weeds, and well ploughed twice, and harrowed fine before the seeds are sown. The best time to sow the seeds is the latter end of August or beginning of September, when they should be dropt into shallow drills, like peas. The rows should be two feet asunder, and the seeds must be scattered one inch distant from each other in the drills; for if the plants are too close together in the spring, they may be easily thinned with the hoe when the ground is cleaned. If the seeds be sown at the before-mentioned time, the plants will appear in three weeks or a month after; and if the weeds appear at the same time, the ground should be hoed over as soon as possible in dry weather, to destroy them; and when the plants are grown an inch high, draw the earth up to their stems, in the same manner as is practised for Peas; and if a ridge of earth be drawn up on the north or east side of each row, it will protect them particularly from the pinching winds which blow from both those quarters; for although this plant will not be in any danger from the frost in ordinary winters, yet in very severe frosts it is sometimes killed; but as it will live in any situation where Peas stand through the winter, there will be no greater hazard of one crop than the other. In dry weather, in the spring of the year, the ground must be hoed again to kill the weeds, and the plants should be again earthed up, in the same manner as for Peas; but there must be great care taken to keep the ground as free from weeds as possible, for if they be permitted to grow, they will soon advance above the plants, and greatly weaken them; and when their pods begin to form, they cannot be too much exposed to the sun and air, whereby they will be less liable to suffer from moisture. When the seeds are sown in autumn, the plants will grow much stronger, and have many more side-branches than those which come up in the spring, and will yield a greater crop of seeds, and produce their flowers five or six weeks earlier, besides having a better season to ripen; but, in order to have them better ripened, the tops of the plants should be cut off with garden shears, about the middle of June, by which the pods will be formed on the lower part of the stalks, which will be greatly forwarded by topping the stalks in the same way as is commonly practised for garden Beans; for where the plants are suffered to extend in length, the lower pods often miscarry, or are less nourished, and those on the top of the stalks are late before they ripen; so, where the topping of the plants is omitted, the pods at bottom will open and cast out their seeds, before those above will be ripe; therefore, to preserve the first, and cut off the other, will be found to be the best method; for by so doing the pods will ripen equally, and much earlier in the season. If the summer prove warm, the seed will ripen in August, and the plants should then be cut off, and laid to dry for five or six days, in which time they should be turned two or three times, that the pods may dry equally; then the seeds may be either threshed out in the field, or the haulm may be housed, to be threshed at the convenience of the cultivator.

11. Trigonella Indica; *Indian Fenugreek.* Legumes sessile, subsolitary, subfalcate; leaflets quite entire; stem diffused, procumbent, not much branched; leaves petioled;

stipules ova e-lanceolate. The whole herb is minutely hairy, or silky; stem a foot long; flowers small, yellow or reddish, drooping.—Native of the East Indies.

12. Trigonella Pinnatifida. Stem prostrate, four-cornered; legumes linear, compressed, erect, sessile; root annual, long, fibrous; flowers axillary, sessile, from three to five; corolla pale yellow.—Native of Spain, in the neighbourhood of Madrid, flowering in May.

Trigonia; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth one-leafed, turbinate; border five-cleft, the two upper segments more deeply divided, erect, diverging. *Corolla:* papilionaceous, five-petalled; banner erect, flat, clawed; wings reflexed, longer, narrowed; keel two-petalled, converging. *Stamina:* filamenta ten, connected into a sheath, distinct at top, some, as three, five, and seven, often barren; antheræ oblong. *Pistil:* germen ovate, small; style short, ascending; stigma headed, flat, girt with a membranaceous margin. *Pericarp:* capsule oblong, three-cornered, three-grooved, acute, one-celled, three-valved: valves boat-shaped, doubled, outer coriaceous, inner membranaceous, woolly within. *Seeds:* very many, roundish, involved in long wool, and connected with a triple thread-shaped receptacle. Essential Character. *Calix:* five-parted. *Corolla:* papilionaceous; petals five, unequal; banner pitted at the base. *Nectary:* two scales at the base of the germen. *Filamenta:* some barren. *Capsule:* leguminous, three-cornered, three-celled, three-valved.——The species are,

1. Trigonia Villosa. Leaves obovate, beneath tomentose, hoary. Stem shrubby; branches round, smooth below, villose above; branchlets hoary, tomentose; racemes from the last axils quite simple, terminating, compound; pedicels opposite or alternate, spreading very much, with a yellowish down on them like the peduncles.—Native of Cayenne.

2. Trigonia Lævis. Leaves oblong, on both sides smooth, shining. Branches below smooth, round, having very numerous raised dots scattered over them; flowers smaller by half than in the preceding, mostly solitary, but sometimes two together, hoary on the outside.—Native of Guiana.

Triguera; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, half five-cleft, permanent; segments unequal, acute. *Corolla:* one-petalled, bell-shaped; tube very short; border ventricose, plaited, five-cleft, longer than the calix, the two upper segments reflexed; nectary membranaceous, short, five-toothed, surrounding the germen. *Stamina:* filamenta five, very short, inserted outwardly into the teeth of the nectary; antheræ sagittate, converging. *Pistil:* germen roundish, two-grooved; style filiform, straight, a little longer than the stamina; stigma obtuse. *Pericarp:* a dry berry, subglobular, grooved, four-celled. *Seeds:* two in each cell, roundish, compressed, rugged, one above another. Essential Character. *Corolla:* bell-shaped, with an unequal border. *Nectary:* short, five-toothed, surrounding the germen. *Filamenta:* inserted into the nectary. *Berry:* four-celled, with two seeds in each cell.——The species are,

1. Triguera Ambrosiaca. Stem grooved and winged; upper leaves obovate, toothed, pubescent; peduncles axillary, in pairs: corolla resembling that of the Henbane, of a violet colour: annual. This is said to possess the emollient narcotic virtues of Deadly Nightshade and Hemlock, being, like them, useful in cancers.—Native of Spain, found in Andalusia.

2. Triguera Inodora. Leaves ovate-lanceolate, quite entire, smooth. This is scarcely winged, the leaves a little, or not at all, running down the stalk: annual.—Native of Spain, found in Andalusia.

Trilix; a genus of the class Polyandria, order Monogynia.—Generic Character. *Calix:* perianth three-leaved; leaflets ovate, acute, spreading, flat, permanent. *Corolla:* petals three, lanceolate, acute, less than the calix. *Stamina:* filamenta numerous, capillary, length of the corolla; antheræ roundish, twin, minute. *Pistil:* germen five-cornered; style cylindrical; stigma simple. *Pericarp:* berry subpentagonal, five-celled, covered with the calix. *Seeds:* numerous, roundish, minute. Essential Character. *Calix:* three-leaved. *Corolla:* three-petalled. *Berry:* five-celled, many-seeded. ——The only known species is,

1. Trilix Lutea. A shrub two fathoms high, with very numerous, round, roughish branches; leaves alternate, petioled, subpeltate, cordate, ovate, serrate, acuminate, veined, pubescent; petioles round, smooth; flowers yellow, not from the corolla but the antheræ.—Native of Carthagena.

Trillium; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* perianth three-leaved, spreading; leaflets ovate, permanent. *Corolla:* petals three, subovate, a little bigger than the calix. *Stamina:* filamenta six, awl-shaped, shorter than the calix, erect; antheræ terminating, oblong, length of the filamenta. *Pistil:* germen roundish; styles three, filiform, recurved; stigmas simple. *Pericarp:* berry roundish, three-celled. *Seeds:* many, roundish. Essential Character. *Calix:* three-leaved. *Corolla:* three-petalled. *Berry:* three-celled.—These plants all grow in shady situations and a light soil, and require the same treatment as Dodecatheon, and Round-leaved Cyclamen. They continue to be rare plants in this country, because they require much attention in their culture, admit of little increase from their roots, and can only be raised from seeds by a tedious process. Sow the seeds upon a shady border soon after they are ripe, and then the young plants will come up in the next spring, but if the seeds be sown in the spring, they will remain in the ground a year. When the plants appear, keep them clean, and in autumn, after their leaves decay, transplant the roots to a moist shady place, where they are to remain.——The species are,

1. Trillium Cernuum; *Drooping Trillium.* Flowers peduncled, drooping; petals lanceolate, acuminate; leaves dilated. Root perennial, tuberous; stem erect, a foot high, simple, round, slightly striated, smooth; leaves three together, terminating, on short footstalks, spreading, rhomboidal, pointed, entire, smooth, veiny, paler beneath; flower-stalk round, a little waved, smooth; petals the length and figure of the calix, whitish, marked with bluish lines, reflexed. The flowers appear in April, and the berries ripen in June.—Native of woods in many parts of North America.

2. Trillium Erectum; *Upright Trillium.* Flower peduncled, erect. This has a taller stalk than the preceding: the three leaves are placed at a distance from the flower, which stands upon a long footstalk, and is erect; the petals are white, or deep purple, longer, and end with sharper points.—Native of Virginia, Canada, and other parts of N. America.

3. Trillium Sessile; *Sessile-flowered Trillium.* Flower sessile, erect. Stalk purple: the three leaves grow at the top like the first, but they are much longer, and end in acute points; the petals are long, narrow, and stand erect, they are of a dark brownish-red, nearly the same colour as the Carolina Allspice.—Native of Carolina and Virginia.

4. Trillium Petiolatum. Flowers sessile, erect; petals linear-lanceolate, erect, a little longer than the calix; leaves petiolated at great length, oval-lanceolate, acute.—Grows near the sources of the Columbia. This singular species, whose flowers resemble those of the preceding species, has leaves very much like Plantago Major.

5. Trillium Pictum. Peduncle somewhat erect; petals oval-lanceolate, acute, recurved, longer than the narrow subduple calix; leaves ovate, acuminate, rounded at the base, abruptly petiolated; flowers white, with purple veins at the bottom; berry scarlet.—Grows in sphagnous bogs, on the high mountains of Pennsylvania, Carolina, and Canada.

6. Trillium Ovatum. Peduncle erect; petals oblong, acute, patent; leaves ovate, sensibly acute; flowers pale purple.—Grows in the rapids of Columbia river.

7. Trillium Pumilum. Peduncle erect; petals scarcely longer than the calix; leaves oval-oblong, obtuse, sessile; flowers deep flesh-colour.—Grows in the pine-woods of Lower Carolina.

8. Trillium Obovatum. Peduncle erect; petals obovate, slightly obtuse, plane, patent, scarcely longer and wider than the calix; leaves ovate-rhombeous, acuminate, sessile; flowers dark rose-coloured, probably white when first opening.—Grows in Canada, near Montreal.

9. Trillium Pendulum. Peduncle inclined; flower pendulous, of a dirty white, with netted veins; petals ovate, short, acuminate, plane, patent, nearly equal to the ovate-acuminate calix; leaves subrotund-rhomboideous, acuminate, subsessile.—Grows on the mountains of Pennsylvania.

10. Trillium Grandiflorum. Peduncle inclined; flower subcernuous, large; petals spathulate-lanceolate, erect at the base, generally white, but varying with rosaceous flowers, and with the germ green or dark purple; leaves widely rhombeous-ovate.—Grows on the mountains and rocky banks of rivers, in Virginia and Carolina. The berries are dark purple.

Triopteris; a genus of the class Decandria, order Trigynia.—Generic Character. *Calix:* perianth five-parted, very small, permanent. *Corolla:* petals five, roundish, with long claws. *Stamina:* filamenta ten, capillary, (united at the base, placed on the outside of the petals so called, the outer ones shorter; antheræ simple, roundish. *Pistil:* germen trifid; styles three, erect; stigmas obtuse. *Pericarp:* capsules erect, keeled at the back, each having a single wing at the base and a double expanded one at the top, not opening. *Seeds:* solitary, roundish. Essential Character. *Calix:* five-parted, with two honey-pores at the base on the outside. *Petals:* five, roundish, clawed. *Filamenta:* cohering at the base. *Capsules:* three, one-seeded, three or four winged.——The species are,

1. Triopteris Jamaicensis. Leaves oblong, acuminate, veined, shining; racemes compound, terminating, loose; fruits three-winged. This is a climbing shrub, with a twining stem, and spreading, diverging, loose, round, smooth branches; flowers on short peduncles, scattered, pale blue, small.—Native of Jamaica and Hispaniola.

2. Triopteris Indica. Leaves roundish, ovate, subcordate, acuminate, shining, smooth; racemes compound, terminating; fruits three-winged. This is a large twining shrub; panicles terminating and axillary, cross-armed, small, delicate, or the whole extremity of the branchlets may be called one beautiful, large, leafy, panicle; flowers very numerous, white; petals oblong, concave, without claws; stigmas headed, entire.—Native of mountain forests in the East Indies.

3. Triopteris Ovata. Leaves ovate, bluntish, subcordate, smooth; petioles biglandular; racemes compound, terminating; fruits three-winged. Stem shrubby, branched; branches opposite, jointed, and smooth, as is the whole plant.—Native of Dominica.

4. Triopteris Rigida. Leaves roundish, acute, margined, marked with lines, coriaceous; racemes compound, axillary; fruits three-winged. Stem shrubby, twining; branches opposite, horizontal, diverging. strict, long, round, smooth, somewhat compressed at the top; flowers small blue. It is very nearly allied to the first species, except in the leaves, which are rounder, very rigid, and marked with lines. It flowers in May, and is a native of Hispaniola.

5. Triopteris Acutifolia. Leaves ovate-lanceolate, acute, smooth; panicle terminating; fruits four-winged; wings equal. Branches round, woody, smooth, as is the whole plant; peduncles jointed, two-stipuled; petals equal, yellow, very small; filamenta short, awl-shaped, widening at the base, and united into a concave body, supporting the germen; seeds somewhat three-sided.—Native of Cayenne.

6. Triopteris Acuminata. Leaves oblong, acuminate, smooth; umbels panicled, terminating; fruits four-winged: wings in pairs, the lower ones shorter. Branches round, smooth, opposite.—Native of Cayenne.

7. Triopteris Buxifolia. Leaves oblong, bluntish, smooth; umbel terminating; fruits four-winged; wings almost equal. Stem round, with a brown bark, and roughened with small tubercles; rays of the umbel four or more, an inch long, jointed, two-stipuled, one-flowered.—Native of the Antilles.

8. Triopteris Citrifolia. Leaves ovate-oblong, acute, smooth; umbels axillary, peduncled; fruits four-winged; wings in pairs, the lower ones shorter. Stem shrubby, climbing very high; branches very long, flexile, round, smooth; leaves stalked, three or four inches long; flowers small, yellow, in axillary and terminal panicled umbels.—Native of South America, Jamaica, and Dominique.

Triosteum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-parted, superior, spreading, length of corolla; segments lanceolate, permanent. *Corolla:* one-petalled, tubular; border shorter than the tube, five-parted, erect; lobes rounded, the lower ones smaller. *Stamina:* filamenta five, filiform, length of the corolla; antheræ oblong. *Pistil:* germen roundish, inferior; style cylindrical, length of the stamina; stigma thickish. *Pericarp:* berry obovate, subtrigonal, three-celled. *Seeds:* solitary, bony, obtusely three-cornered, obtuse, grooved. Essential Character. *Calix:* five-parted, length of the corolla. *Corolla:* one-petalled, almost equal. *Berry:* three-celled, inferior. *Seeds:* solitary.——The species are,

1. Triosteum Perfoliatum. Leaves oblong, connate; flowers sessile, in whorls. Root perennial, composed of thick fleshy fibres, which are contorted and rough; stems several, strong, herbaceous, rising a foot and half high, having at each joint two oblong broad leaves, embracing the stem; from the bosom of these come out the flowers in whorls, sitting very close to the stem; they are small, of a dark red colour, inclining to purple, and appear at the beginning of June.—Native of North America. See the next species.

2. Triosteum Angustifolium. Leaves elliptic-lanceolate, connate; peduncles opposite, one-flowered. This differs from the first species in having longer and narrower leaves: the flowers stand single upon short peduncles, and there are but two at each joint, whereas the other has many growing in sessile whorls round the stalks. The roots of both these plants are used indiscriminately in North America, as an emetic, for Ipecacuanha.—Grows on the borders of woods in Virginia and Carolina.—Both species are hardy enough to thrive in the open air, but should be planted on a moist light soil; and, on dry ground, must be watered constantly in dry weather. Sow the seeds on a border of light earth, where only the morning sun comes. If they be sown in the spring, they will remain in the ground a whole year, during which time the border must be constantly kept clean. If sown in autumn, they will come up in the following spring: keep them constantly clean, for if weeds be permitted to grow

among them, they will soon overbear the plants while they are young. Let them remain in this seed-border until the following Michaelmas, when they should be carefully taken up, and transplanted wherever they are intended to be fixed. Some ought to be reserved in pots to be sheltered in winter, when all those in the full ground are sometimes destroyed by the severe frosts. They may also be increased by parting the roots in the spring, just before the plants begin to shoot, which is commonly about the middle or end of March; but, in doing this, the roots must not be parted too small, for that will prevent their flowering strong. They perfect their seeds in this country every year: the seedlings will not flower until the third year.

3. Triosteum Triflorum. Peduncles opposite, three-flowered; leaves petioled. Stem erect, a foot and half high, simple, very finely pubescent; petioles pubescent, shorter than the stipules, which are wide at the base, awl-shaped, pressed close, scarcely half an inch long; flowers sessile.—Supposed to be a native of Madagascar.

Triplaris; a genus of the class Triandria, order Trigynia, according Linneus; of the class Dicœcia, order Dodecandria, according to Scrœber.—Generic Character. *Calix:* perianth one-leafed, ovate, trifid; segments lanceolate, membranaceous, spreading; ray long, permanent. *Corolla:* petals three, length of the tube of the calix. *Stamina:* filamenta 9 to 12, awl-shaped, length of the tube of the calix; antheræ linear, membranous, ovate. *Pistil:* germen ovate, triangular, angles compressed; styles three, awl-shaped, length of the stamina; stigmas three-sided, villose. *Pericarp:* none. *Seed:* nut three-sided, within the ovate base of the calix. Essential Character. *Calix:* very large, three-parted, or six-parted. *Corolla:* three-petalled, or none. *Nut:* three-sided, within the ovate base of the calix.——The species are,

1. Triplaris Americana. Spikes erect, terminating; leaves oblong, acuminate, very large, a span long, entire, petioled. It is an upright elegant tree, with a trunk forty feet high, and a thin head made up of horizontal branches, forming a long pyramid; nut ovate, acuminate, of a smooth and shining black.—Native of South America.

2. Triplaris Ramiflora. Racemes lateral, aggregate; leaves ovate or roundish ovate; fruit a little smaller than the preceding.—Native of the woods near Carthagena.

Tripsacum; a genus of the class Monœcia, order Triandria.—Generic Character. *Male Flowers:* double, on one side, alternate, in the upper part of the spike. *Calix:* glume two-flowered; outer floret male, inner neuter, each two-valved; outer valve lanceolate, flattish, obtuse, awnless, cartilaginous, with the margins thinner, (the exterior one straightish,) embracing the interior, oblong, triangular, boat-shaped, acute, almost the length of the exterior. *Corolla:* in each floret two-valved, membranaceous, very thin, awnless, less than the calix; valves nearly equal; exterior ovate, boat-shaped, bluntish; interior lanceolate, bifid at the top. Nectary two-leaved, very small; leaflets triangular, fleshy, convex, truncate, mucronate at both ends, the upper margin thinner, the middle emarginate. *Stamina:* of the outer floret; filamenta three, capillary, longer than the calix; antheræ parallelopiped: of the inner floret; filamenta three, very slender, subconnate; antheræ none. *Female Flowers,* on the same spike below the males, immersed alternately on each side into the rachis. *Calix:* involucre ovate, cartilaginous, very thick, ventricose below, shining, obscurely margined on both sides at the back, subemarginate, with a blunt top, embracing the glume with its thinner margin; glume two-valved; outer valve oblong, ventricose, attenuated at the top, acuminate, thickish, doubled; inner similar, bluntish. *Corolla:* two-valved, smaller than the calix, and more tender; outer valve larger, ventricose, bluntly three-toothed; inner scarcely smaller, flat at the back, emarginate: abortive glume one-valved, oblong, folded together at each margin, two-toothed, by the anterior side of the fertile corollet, and much smaller than it. Nectary two-leaved, very small; leaflets linear, membranaceous, very thin, acutely emarginate at the top. *Stamina:* filamenta three, at the base of the germen, very small, broad at the base, capillary; antheræ linear, very small, barren. *Pistil:* germen oblong; style longer than the calix, compressed; stigmas two, very long, twisted, villose. *Pericarp:* none. *Seed:* one, ovate, compressed a little, pointed with the permanent style. *Observe.* At the base of the involucre, on each side, is a sinus gaping externally, with an aperture blocked up by villose hairs. Essential Character. *Male. Calix:* glume two-flowered. *Corolla:* valves membranaceous. *Female. Calix:* glume with perforated sinuses. *Corolla:* two-valved. *Stigmas:* two. *Seed:* one.——The species are,

1. Tripsacum Dactyloides. Spikes androgynous. Leaves long, linear, taper-pointed, an inch broad, smooth; culms the thickness of a goose-quill or of the little finger, with few joints and long internodes, angular, tinged with purple, as high as a man, dividing at top into three, four, or five spikes, a long span or a foot in length, and straight.—It flowers in August, and is a native of Virginia. It is a hardy perennial.

2. Tripsacum Hermaphroditum. Spike hermaphrodite; root annual, fibrous; culm erect, two feet high, roundish, very smooth, jointed, branched; branches of the same structure and height with the culm, alternate, erect, quite simple, few; leaves alternate, flaccid, very smooth, only rugged at the edge, a span long or more; sheath compressed, striated, very smooth; flowers alternate, remote, solitary, sessile on the teeth of the receptacle, ovate, pressed close; the outer calix has two, three, or four flowers; glume four or five parted, compressed, ovate, gibbous at the base, contracted at the top; the valves incumbent, very stiff, lanceolate, acuminate, slightly striated.—Native of Jamaica; where it is fed upon by all sorts of cattle.

Triticum; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* a common receptacle elongated into a spike; glume two-valved, subtriflorous; valves ovate, bluntish, concave. *Corolla:* two-valved, nearly equal, size of the calix; exterior valve ventricose, blunt, with a point; interior valve flat: nectary two-leaved; leaflets acute, gibbous at the base. *Stamina:* filamenta three, capillary; antheræ oblong, forked. *Pistil:* germen turbinate; styles two, capillary, reflexed; stigmas feathered. *Pericarp:* none, the corolla fosters the seed, opens, and drops it. *Seed:* one, ovate-oblong, blunt at both ends, convex on one side, grooved on the other. *Observe.* The exterior valve of the corolla in some is awned, in others awnless; the middle floret is often male. Essential Character. *Calix:* two-valved, solitary, subtriflorous, or many-flowered, on a flexuose toothed rachis. *Corolla:* blunt, with a point.——The species are,

* *Root annual.*

1. Triticum Æstivum; *Summer* or *Spring Wheat.* Calix four-flowered, tumid, smooth, imbricated, awned. This is suspected to be a mere variety of the following species; and, if sown in the spring, will produce a speedy but uncertain crop. This sort of Wheat is supposed, and with great probability, to have been originally produced in Sicily, where it is known under the name of *Tumenia,* a corruption of *Trimenia,* or Three-months Grain. It is much cultivated in Barbary, Spain, Portugal, France, Germany, and in most

corn countries except England, where, on account of the immense consumption of malt liquors, Barley is more in demand. There are fifty varieties of this sort of Wheat: the variety best known in this country has awns like Barley, and is sometimes on that account called Rough or Bearded Wheat. The pickle or grain in it is red; but it has not so bold or full a sample as Winter Wheat, though it weighs better, and is preferred by all honest millers who know its nature and value. Some farmers mix it with different proportions of Winter Red Wheat, as the Red Lammas, which resembles it so much in colour, that they never fail to profit by the practice, as it increases the weight of the mixture more than it diminishes the quality of the sample, and also renders it more productive at the mill. The proportions employed are usually about one half, or rather less than that quantity, in such mixtures. The average weight of Spring Wheat is in general about sixty pounds per bushel. The bread made from its flour is said to be sweeter than that from winter corn of the Wheat kind; and also more nutritious, containing a larger proportion of gluten, or half animalized matter, in its composition. The bread is also allowed to be more palatable to those who eat it habitually. Sir Humphrey Davy has shewn that it has more gluten, or real nutrient matter, in it, when compared with other grains of the same kind, than good Winter Wheat, in the proportion of twenty-four to nineteen in the hundred; and that with respect to the bran, there is only a difference of two parts more in the hundred, when compared with good Winter Wheat of this country: from which it follows, that the difference in price between it and such Wheat, when of equal weight, should only be in that proportion. The advantages which would attend the more general introduction and growth of this sort of Wheat, demand particular attention, as they are both of a public and private nature. In the latter point of view, it is of great importance for the farmer to be able to raise so valuable an article as Wheat, though sown late in the spring, or even in the beginning of summer. It was formerly thought, that after Turnips, which crop was considered as the basis of good husbandry on light sorts of land, that Barley, including Bear or Bigg, was almost the only crop that could be grown with advantage, as the sowing of Winter Wheat in the spring could only be attempted or practised in a partial manner. But it now appears that Spring Wheat may be raised and grown with as much ease and facility, and with more profit, than the inferior sorts of Barley. A still more important circumstance in favour of Spring Wheat is, that it appears not only to be exempt from the blight or mildew, but not liable to risk of damage or injury from the grub or wire-worm, which is not attributable to the nature of lands or seasons; for the farmers of the extensive tract known by the name of South Holland, in the county of Lincoln, in which there are various kinds of land, uniformly declare, that they were compelled many years ago, by the frequent attacks of the blight and mildew, almost entirely to abandon the sowing of Winter Wheat, and to substitute Spring Wheat in its stead, the latter not being liable to the disease of blight or mildew; as has been lately proved in a field of twelve acres, remaining wholly exempt from that disease, in a district where every other field was miserably infected with that prevailing disease. It must, however, be admitted that Spring Wheat is as liable as other kinds to be affected with the smut, and consequently that it must be carefully washed, bruised, or pickled with a very highly-saturated solution of common salt, in such a manner as to prevent the danger of this sort of infection. It has been objected to the grain of this sort of Spring Wheat, that it is of a hard flinty quality; but it is answered, that our millers find no difficulty in grinding it: and it is well known, that the hardier and more flinty the grain, the better and liveller is the flour. In regard to safety, no crop can be more certain than Spring Wheat, when sown in a proper season, with good well-washed or pickled seed, in the manner already stated, and on land properly prepared for its reception. As to the sorts of land, and the situations in which this sort of Wheat can be produced, it has been found that almost all the kinds, from the clayey marly descriptions, to those of the light sandy sorts, are capable of affording it: but it is most suited to such lands as are remarkable for promoting a quick vegetation, and growth in the grain. It is also important to be known, that land of the fenny kind, with a bottom of the turfy earthy sort, is particularly adapted for the growth of Spring Wheat, which will rise on it in a speedier manner than on any other land; and land of this quality not being suited to the growth of Winter Wheat, which is liable to be thrown out of them by frosty seasons, on account of their lightness; by having all such lands in the different parts of the united kingdoms, sown in suitable courses with Spring Wheat, a vast, and scarcely calculable advantage, it is thought would be produced. Spring Wheat of the true kind, though sown so late as the middle of May, has been found to become ripe at the same time with the Autumnal or Winter Wheat; and therefore there is no advantage obtained by sowing it earlier, as that which has been put into the ground in April, has become ripe as early as that sown in the beginning of the preceding month. In its growth it is said not to tiller in the manner of Common or Winter Wheat, but shoots up, and advances immediately and directly from the moment of its appearance above the surface of the ground. The grains or corns, which are smaller than those of the Common Winter Wheat, become larger and finer by being grown on better and more fertile land. It deserves to be tried in the mountainous parts of Derbyshire, Yorkshire, Lancashire, and some other northern districts, where little or no Wheat is sown, the situations and exposures being too cold and open for Wheat sown in the autumn, there to survive the severity of the winter. It has been noticed, that though under particular circumstances Spring Wheat, when lately tried, has generally succeeded, and that it is now the prevailing husbandry in an extensive district in Lincolnshire, and as the growth of Wheat has become of more importance than ever, no sufficient reason can be assigned why it should not be raised in every district of this country, which is calculated for the growth and cultivation of so important a national resource. On various soils, in some seasons, it frequently happens that autumnal sown crops of Wheat are seen to have failed, and gone off in patches: but the uniformity of the crop may be restored by raking Spring Wheat into the vacant places, in the beginning of April, which will be ready for the sickle quite as early as the Autumnal-sown Wheat; and although this mixture would render the produce highly improper for seed, still, for the miller's use, no objection can be made.

2. Triticum Hybernum; *Winter*, *Lammas*, or *Common Wheat*. Calix four-flowered, tumid, even, imbricated, abrupt, with a short compressed point. Root consisting of downy fibres; stems one or more, erect, straight, from three to five feet high, round, jointed, smooth, leafy; leaves linear, pointed, flat, many-ribbed, rough, entire, rather glaucous; stipules jagged, bearded; spikes solitary, two or three inches long, dense, two-ranked, smooth; joints of the common stalk bearded; glumes smooth; corolla of the upper spikelets more or less awned.—Native country unknown. It is by no means

improbable, from the nature and habits of Wheat, that it may have come originally from the hilly country of the East, and have been rendered hardy by time and cultivation in this and most other parts of the world. Of this grain there are two different species in cultivation in this country: the *Smooth* or *Polled*, and the *Cone* or *Rough-bearded Wheat*. The first is the most general, and best adapted to the general soil of Great Britain; as it also produces the finest flour. Numerous varieties are also preferred, for peculiar situations. The latter is often called *Rivet Wheat*, and has likewise several varieties, principally differing in the colour of the chaff, and the form of the ears. It yields the largest quantity of produce on stiff moist clayey lands; and, though it does not afford the finest flour, being less subject to diseases and injury from too much moisture, and less liable to lodge from its firmness of stem, it is frequently preferred on stiff clayey soils.—It must, however, be allowed, that the number of sorts of this grain is annually increasing by importation from foreign countries; and it is admitted, that the old sorts are the Brown and Yellow Lammas, the White Straw, Fulham, and the White or Egg-shell. The Brown Lammas was the kind chiefly cultivated in Kent till within the last thirty years, and has now given way to a variety of the new kinds, as well as some of the other older sorts, experiment having proved it to be the least productive. It is the common Brown-strawed Wheat, that grows with a long jointed ear, the chaff of a dark brown colour, the straw long and apt to fall, the hull or bran thin, the flour very white, and the corn mellow in grinding, which causes it to be esteemed by the millers as the best of the old sorts. The Yellow Lammas resembles the Brown in every respect, except that the colour of the grain is of a yellow hue, and the chaff of a somewhat lighter colour than the others. A Red Lammas, with a red straw, red ear, and red kernel, is noticed by Young, as being reckoned by many farmers the best of all the sorts hitherto known, as yielding the finest and whitest flour. Mr. Boys says, that the White-strawed Wheat takes its name from the colour of its ear, and in other counties has the title of the Kentish White Straw. He observes, that it sends out a greater number of stems from the stool or plant than the other sorts, and in that way is often a very thick crop on the land; also that the straw is shorter than in many other sorts, and less liable to fall in rainy seasons. On these accounts it is much sown in the eastern parts of Kent, but, from its dull colour, thick bran, and often grinding very steelly, is generally disliked by the millers. It is remarked, that the Fulham sort produces a white straw, which grows short and coarse, but is very productive, particularly on poor land; the grain however is coarse, and the bran thick. The Egg-shell Wheat is known by its producing a white straw, a smooth white chaff, and very white grain, the bran of which is very thick, but the flour remarkably white. It works mellow in grinding, is very early ripe, and so free in the ear as to blow out in windy weather, which is a disadvantage. The principal new sorts of Wheat are the Hoary White, the Nonpareil, the Pilbeam, the Square-ear, the Hoary Brown, and the Hoary White, called by some the Velvet-eared, which last is by far the most valuable, being very productive. It has a thick straw, white and short; the chaff covered with a thick fine down, somewhat of a brownish blue; the grain remarkably small, and of a dull white colour; the bran very thin, so that the grain in some cases is almost transparent when held up to the light. It grinds very mellow, and yields a fine white flour. Owing to the quantity of down upon the chaff, and its small ears binding up very close in the sheaf, in rainy reasons it is liable to vegetate too freely in the field, and on that account is not so proper to cultivate in a moist climate, and in small enclosures that are not open to the influence of the sun and winds. The Nonpareil is said to have been brought into this country from America: it has a bright straw, with a brown ear; and the grain is very white, large, and plump. It is very productive on all soils; thrashes very freely, and yields in that operation the greater part of its chaff, thereby producing a great quantity of horse-meat; it grinds very mellow. The Pilbeam is a brown Wheat, growing very stiff, and generally thick on the land. The grain is small and plump, somewhat of a yellow-brown. It is accounted very productive on rich lands, and is a valuable kind to mix with others, but will not of itself make good bread, because it does not ferment properly in that operation. The Square-eared Wheat is a very productive sort, but is apt to drop out in the field before it is ripe, and in gales of wind, on which account it is not so much cultivated. The Hoary Brown is but lately introduced, and but imperfectly known; so also is the Hoary White, which has a white straw, ear, and grain. The Hedge Wheat is also white, and very productive. The Velvet-eared is distinct from the Hoary White; but is not weighty, though white, and affording much flour, having a thin skin. There are also different varieties of Cone or Bearded Wheat. Of the Rivet Wheat already mentioned, there are two sorts, the White and the Brown, neither of which are much cultivated in Kent. They both ripen late in the season, and are so coarse and steelly as to be unfit for making bread, unless mixed with a large proportion of a better sort of flour. Besides being very productive on strong wet lands, and also in very poor wet cold soils, it is thought to be the best adapted to such kinds of rich lands as have been newly broken up, and where there may be danger of the crop lodging from too great luxuriance, as its straw is firm and strong. The White and the Red are the sorts most esteemed among the Polled kind; the former affording the whitest flour, but the latter being generally most productive. Of the several sorts of Wheat cultivated in the county of Sussex, the Velvet-eared is preferred in the weald part of it, as having by much the thinnest skin, and being there called Stuffed. It weighs from fifty-nine to sixty pounds a bushel. The Clark Wheat is not bearded, has a red blossom, red chaff, and red straw; and is a great yielder, requiring to be cut forward. The Hedge Wheat, called Chidham White, is much cultivated in the southern and northern counties: it is white, of a very fine berry, and remarkably long in the straw. A few years ago, as a person at Bradfield was walking through his Wheat-fields, when the corn was in full blossom, he was struck with the variety of hues which the blossoms assumed, which he at first conceived might be owing to their different stages of forwardness; but on particular examination, and more mature reflection, he concluded they were certain signs of a specific difference in the quality of the Wheat: impressed with this idea, he selected the ears of different hues, and particularly marked eleven distinct numbers; noting very minutely their characteristic qualities and appearance in the field. These he gathered, and kept separate when ripe, and planted them apart from each other in his garden; where the same characteristic difference was observed to continue, upon the several numbers, when growing in the garden, as was observed in the field during the preceding summer.—The common autumn or winter sort of this grain is in general most suited to the heavier descriptions of mellow soils, which do not retain too much moisture. They should, however, be of a fertile quality, and capable of affording a fine sur-

face mould for the reception of the grain. But good crops may be raised on the lighter sorts, though the introduction of it on such kinds of lands, has been suggested as disadvantageous from their being so much more adapted to the raising of other kinds of crops. The Cone, Bearded, or Rivet sorts of such Wheat, are the most proper for the heavier, more moist, and less broken down and reduced kinds of land, that have been more lately put in cultivation, on which very weighty crops are not unfrequently produced.—*Propagation and Culture.* Wheat is generally grown after the land has been prepared by repeated ploughing and harrowing or summer fallowing. In some cases Flax and Hemp afford a good preparation for this grain; but some consider Beans as the best, though experiment has shewn Tares and Clover to be equally favourable. In Norfolk, Wheat almost constantly succeeds Clover, except where Pea or Bean crops are interposed, the land being scarcely ever fallowed with this view, except in the case of what are called Bastard Summer Tills. It has indeed been well observed, that if there be one practice in husbandry proved by modern experiment to be worse than another, it is that of sowing Wheat on fallows. In some counties the fallows are ploughed just before harvest, on two-bout ridges, ready to plough and sow under the furrow in the spraining method, a seedsman to every plough, which reverses the ridges. In others they lay their land into ten or twelve furrow stitches or ridges, and sow some under the furrow, some under the harrow. The ridges vary exceedingly according to their wetness; and in Kent they have, by means of the turn-wrest plough, no lands at all, but a whole field one even surface. It would be useless to dilate on the circumstance attending fallow Wheat, as it ought not to be grown; for if fallows be, or are thought, necessary, let them be sown for Barley or Oats, or with any thing but Wheat. However, in whatever manner, or after whatever crop, Wheat may be cultivated, the soil should constantly undergo that sort of preparation, which may be sufficient to bring it into a state of considerable fineness of mould, especially in the more superficial parts, and thereby prevent as much as possible the rising of weeds; for it has been well noticed by a late writer, that whoever has attended to the progress of this sort of crop in such lands as have been well broken down and reduced, and in such as have been left in a lumpy crude state, at the time of sowing, will have found the difference to be very considerable. But it may be remarked, that when this kind of crop is taken after Clover, the land seldom undergoes more than one ploughing, which takes place in general immediately before the seed is sown. In many cases, however, where this mode is adopted, the grassy matter is extremely apt to rise and injure the crops in the more early stages of their growth; hence it may be better to follow the practice adopted in some districts, of using a skim-coultered plough, by which the remains of the Clover-weeds and grassy material on the surface will be cut or skimmed off, and turned into the bottom of the furrows, where they are immediately covered with the loose mould from below to such a depth, that little or no inconvenience can be sustained by them, while the land is thus rendered more clean, and capable of being harrowed in a more perfect manner, than where the common plough only is employed. Besides, a better bed of mould is probably turned up in this way for the seed to vegetate in, provided the furrow is not made of too great a depth and breadth, and remain some time before it is sown, which the agriculturist should constantly attend to in preparing this kind of ground for Wheat crops. But it is the custom of some counties, as Norfolk and Warwick, where the land is often continued two years in a state of Clover, to break them up in the latter end of June, in the second giving two, and sometimes three ploughings. Where the situation is favourable, and the weather turns out suitable for reducing the soil to a proper state of tilth, this may be an advantageous practice, as by such means great benefit may be obtained by cutting the grass in the beginning of the season in which it is to be ploughed up; but where circumstances of so favourable a nature do not occur, such a method of preparation must be less beneficial than that of giving only one ploughing. In the preparation of a Clover ley for Wheat, Mr. Ducket has observed a singular experiment. He had a field, in which Wheat generally turned out greatly root-fallen. This field he scarified repeatedly, till he had torn up the Clover, and also produced tilth enough for drilling it in; then he collected the Clover fragments, and carted them into the farm-yard to make dung, and drilled the field: the Wheat having a firm bottom in an unstirred soil, surmounted the disease, and produced abundantly. The Clover-bulb, which would have secured the dreaded looseness of the soil, had it been turned down, made a large quantity of useful dung, though it was not applied in that particular field. It has also been stated, on the authority of a cultivator of considerable experience, that, in cases where the Clover-crops have been such as to leave the land in a foul weedy condition, it would be highly improper to sow them with this sort of grain, as, from its remaining such a great length of time upon the ground, they may be liable to have their seeds perfectly evolved, and brought into a state of vegetation. In such cases it has been suggested as more advantageous, to have recourse to such sorts of crops as may require the operation of hoeing during the time they are upon the ground. The putting in of Wheat after Pea crops, may probably be attended with success in such districts as are, from the nature of their situation, sufficiently early to admit of the land to be prepared and fully cleaned by repeated ploughings and harrowings, after such crops have been removed, before the proper time for sowing the grain. But where they are so late as only to allow of the land being prepared by one ploughing before the period for sowing, it is supposed by some to be an extremely hazardous practice to attempt the culture of Wheat after such crops; because, unless the ground be in a high state of tilth, there can be little chance of a good crop. This is the opinion of the author of the work on *Modern Agriculture;* but the Norfolk farmers are in the constant habit of setting or sinking in Wheat upon a Pea stubble, with a single ploughing, and consider it a very safe and excellent husbandry. The Pea crop ought however to be kept clean; and after it is harvested, the haulm harrowed off. They never plough a Bean-stubble more than once. In some counties it is the constant practice to cultivate Beans and Wheat alternately on the same land for some time. This is the case on the stronger kinds of soil in the county of Kent, on which it is found to answer in a very advantageous manner; and where Wheat is occasionally sown after such crops, it is often found an useful practice; but in all such cases the Beans should be cultivated in drills, as from twenty to thirty inches' distance, in order that they may admit of being hand and horse hoed in the most perfect manner. If this method has been followed, and the business of hoeing during the growth of the crops effectually performed, the land may be sufficiently prepared for the succeeding Wheat crops, by one ploughing, as the soil, from being thus kept clean, and in high tilth, can scarcely fail of affording a good produce. It has been remarked, that where the farmer has a Bean stubble intended to be sown with Wheat, he should give it

the due tillage as early as possible, which should be regulated by the soil, as on some it may be better to trust the skim-scufflers and scarifiers than the plough. Where the land is very clean, the great skim of the Isle of Thanet is capable of cutting through every thing, and loosening the surface sufficiently to enable the harrows to render it as fine as possible, being picked and burned by women. Where the land is not so clean, the Kentish wood-share may be more effectual; but in most other cases the scuffler may be sufficient for the purpose. When the farmer has got the surface to his mind, he is to consider whether or not he should plough it, which is advisable if the soil be of a firm, solid, tenacious quality, and if he does not intend to drill the Wheat: if he should plough such a soil, he may not have any apprehension of root-fallen Wheat, that is, failing roots from a loose bottom; but he will bring up a new surface that may drill with difficulty, whereas that which has received the influences of the crop, atmosphere, and of his late operations, will be exactly in the right temper for the drill to work in. If the soil be of a more loose friable quality, and he should plough down the fine surface he has gained, he will give the Wheat too loose a bottom, and will run the risk of a root-fallen crop. In all cases, or in any that have a tendency to this evil, he should determine not to plough at all, but drill directly; a method in which he saves tillage, and has the probability of a better produce. This, it must be allowed, is rather a new practice on strong land; but the practice has met with such success, that no reason is left for doubting the soundness of its principles. It should be remembered, that whatever other circumstances may influence the growth of this grain, it loves a firm bottom to root in, and rarely flourishes to advantage where the foundation is loose and crumbly; nor will a depth of such mould do, if the under stratum in which it will attempt to fix its roots, be from its quality of a repellent nature: the best basis is cultivatable earth, when become firm from not having been lately disturbed.—Where the district is early, and the land is preserved in good order by proper modes of cropping, Wheat may be grown after Beans, whether cultivated in the drill or broadcast system, with success, as there will be sufficient time to give the necessary preparation before the time of sowing. But in other situations, it is found advantageous, when this crop is to be grown after either Peas, Beans, or Tares, to plough the land in as light or shallow a manner as possible, and then harrow and take out the roots and weeds, so that they may be consumed on the ground in heaps; the field being after this formed into proper ridges for the reception of the seed, by ploughing again a few inches deeper than the first: and in some cases it is even harrowed after the second ploughing, and ploughed a third time for the putting in of the grain. Wheat, too, may sometimes be cultivated to great advantage after Turnip crops, on the heavier Turnip soils, especially where they have been kept clean from weeds by repeated hoeing, and fed off upon the lands at such early periods as to admit of the ground being prepared by once ploughing in a light manner. In cases where this kind of crop is intended to be cultivated after Potatoes, which, from their having a great tendency to lighten the soil, as well as to exhaust it, should never be done on the lighter sorts of lands in backward situations, or under any circumstances where a sufficient proportion of manure has not been applied for the Potato crops, one light ploughing immediately before the seed, may be in most cases an adequate preparation, as, where proper attention has been bestowed in the culture of such crops, the soil is generally left in a sufficiently fine condition for the purpose. It has been observed, that the cause of Wheat not succeeding well after Potato crops, in many instances is, that, besides the land being rendered too light and porous by the growth and cultivation that are requisite for them, the Wheat becomes more exposed to the injurious attacks of the grub and earth-worm, and other insects, and, in some exposed situations, from the seed-time being protracted; the practice obviously becomes improper. In growing the crop after those of Hemp and Flax, as weeds are apt to rise, it is always proper that the land should be ploughed over two or three times, in order that a fine state of tilth may be produced. The custom of giving but one earth after such sorts of crops, can seldom, if ever, ensure full returns of this grain. It has been said, upon the best authority, that experience shews, in the most clear and satisfactory manner, that this sort of crop should never, when it can be avoided, be grown after other kinds of grain-crops, as Rye, Barley, or Oats; and that the manure should not be applied to it, but for such crops as may precede it: for where the contrary is practised, the crop is not only liable to be injured by the rampant growth of weeds, but from its being more apt to be diseased. On the whole, it may be observed, that whatever the nature or state of the ground may be, or the kind of crops that precede this sort of grain, it would appear that the preparation for it should always be such as has a tendency to reduce the parts of the soil to a pretty fine state, as under such circumstances the growth of the crops is not only more regular and perfect, but, from the even and compact state in which the surface is left, it is more fit for affording support and protection to the roots of the Wheat-plants, as allowing them to spread and extend themselves with greater readiness in the fine mouldy earth thus provided, as well as by its falling down more closely about them. It has however been contended by some cultivators, that a rough cloddy state of the surface part of the land, is the most proper state for the cultivation of this kind of crop, as the young Wheat-plants are thereby better guarded and secured against the effects of the severe cold so common in our winters. It seems probable, however, that cold seldom becomes hurtful in any great degree to Winter Wheat-crops, except when accompanied by too much moisture, or where sudden frosts and thaws have the effect of rendering the surface parts of the soil so light and open, as to be incapable of affording proper support to the roots of the young Wheat-plants. In Berkshire, three ways of preparing the land for Wheat are practised: by summer fallowing, and manuring with yard-dung, compost, rags, soot, and chalk in some cases; by folding on it with sheep, in cases where the ground is not of too deep and wet a nature; and by putting it in on the back of Clover leys, after one or two crops of grass, by one or more ploughings. Some, however, think that manuring for Beans or other crops is a much better practice when followed by Wheat, than the old custom of fallowing and manuring for this crop, which renders the land too light, and consequently subject to blight. In Oxfordshire, the farmers prepare for Wheat by different numbers of ploughings, according to the circumstances of the land; but the layers are mostly ploughed in a shallow manner, as Wheat loves a firm bottom to root in, and which ploughings in sandy land cannot be too light.—With respect to the time of sowing Wheat, the earlier the autumnal sowings can be put into the soil, the greater chance the young plants will have of being well established before the frosts take place, on which the welfare of the crop is well known to depend. The state of the land also, and of the season, are much more proper for the process of vegetation, when the crop is put in at an early period, than when delayed till late; the state of the

weather, in the latter case, often admitting of only a very languid and imperfect growth till the spring, by which the crop must be exposed to much danger from various causes. Experience has abundantly proved that late-sown Wheats seldom succeed so well, or afford such plentiful crops, as those that are put in early. But when sown too early, there may notwithstanding be the danger of the crop running too much to straw, and producing light ears. From the beginning of September to the middle or even the end of October, may probably be considered as the most favourable time, according to the established practice of the most correct farmers, in almost every district of the kingdom where this sort of grain is sown. If sown early, especially on the heavy kinds of soils, the land is for the most part in too hard and lumpy a state to admit of the seed being properly covered by the harrow; and in the lighter ones, in too dry a condition for the grain to vegetate in a proper manner: and when delayed later, the ground in one case is apt to become too wet and close by the falling of the autumnal rains, and in the other too loose and porous from the action of the frost. Mr. Young proposes September as the best season for cold backward wet soils, and October for those of the more dry and warm kinds, after there has been a plentiful rain. There are, however, circumstances that may render the times of sowing different; as, where the soils are of the rich, fertile, loamy, chalky, or gravelly kinds, it may be better to defer it, in many instances, to a considerably later period; as when such warm lands are cropped too early, they are apt to push the plants forward so rapidly that they become weak and spindling in the early spring months, and at the same time the crops are more liable to be infested with weeds, on account of the season being then more favourable to their growth. But that the practice of putting in crops of this sort so late as the latter end of November and beginning of December, frequently depends on the crops that precede them not being capable, from the lateness of the district, or other causes, of being taken off so early, as that the land may be made for the Wheat-crop in the proper time. This is often the case after Peas, Beans, Tares, Turnips, and other similar crops. In these cases, on the lighter sorts of soils, and where drill-culture is employed, it may often be an advisable practice to sow in the spring, as by such a delay the ground may be brought into a more perfect state of preparation than could be the case in sowing it so late in winter. Those persons who sow Wheat in autumn, lose the great advantage of a previous crop of Turnips, both as to destroying weeds and manuring the land; and they create the labour of either hoeing, harrowing, or otherwise tampering with the weeds and young Wheat in the following spring. A wet seed-time sometimes renders it impossible for the farmer of a clayey soil to sow his usual quantity of Wheat in autumn; this should not induce him to sow his grain while the land is too wet for the occasion; he ought rather to wait for the first favourable opportunity in the months of February or March, by which time frost will have mellowed the land. He should then sow the residue of his Wheat, as the probability is great that Wheat sown on a mellow soil, in a dry February, will be more productive than if it had been sown on the same land in an adhesive state during a wet November. The autumnal-sown Wheat precludes cultivation for one entire year, which, setting aside all other circumstances, gives great encouragement to the growth of weeds: but in order to estimate the great mischief done by sowing Wheat in that season, its connection with the usual course of crops must be considered. For instance, first, in the ancient, and still very common course of fallow, Wheat, and Oats, there is seldom any ploughing from the sowing of the Wheat until the sowing of the Oats, which is a year and a half: secondly, in the course of Wheat, Clover, Spring Corn, or Pulse, there are two years together in which the plough cannot possibly be put into the ground: thirdly, in the valuable course of Turnips, Barley, Clover, and Wheat, the plough is shut out of the ground for nearly two years and a half. These three causes include most of the arable land in Britain, and they shew the prodigious encouragement which such courses give to the growth of weeds. On the contrary, Wheat sown in the spring occupies the ground only half a year, and when that is placed in a succession of Winter Tares and Turnips every two years, the weeds have not time to grow in such a manner as to produce any material injury. There is no period of such a course of more than six months in summer, or eight in the winter, free from the operation of the plough. This degree of tilth keeps the land free of weeds, and thereby preserves it from being exhausted by them; and by giving the green and root-crops to sheep and other cattle on the land, it becomes doubly manured every other year, which cannot fail to force the Wheat as if it were sown in a hot-bed. It is not advisable in every possible case to refrain from sowing Wheat in the autumn, in order to sow it in the spring. A dry seed-time is of so much importance to the occupiers of fenny soils, that they ought not to let any such time pass without sowing their grain. In the case of a dry autumn, which is the same thing as a fine seed-time, the farmers should sow all such land as is then ready, and thereby ensure the important points of a good seed-bed for their grain, and against the dangers of a wet spring. On the other hand, the more rain that falls in autumn, the better chance there is of having a dry spring; and consequently in every wet autumn the Wheat sowing should be postponed until the spring.—The proportion of seed that is necessary in different cases, must depend upon, and be regulated by, a variety of different circumstances; but in general from two to three bushels, according to the state of the soil, the nature of the climate, and the period in which it is put into the ground, may be the most suitable proportion for soils of a medium state of fertility, under the broadcast method of husbandry: but where the drill system of culture is practised, a considerably less quantity may be sufficient for the purpose. In the drilling and dibbling methods of sowing, however, which are unquestionably the best, where they are performed with correctness, six pecks of seed are sufficient; in the latter mode two rows being put on in a flag, care being taken to have the land rolled after having been ploughed a fortnight or more, and the seed dibbled in to a sufficient depth, without scattering, covering it in by bush-harrowing. Where the lands have a known disposition to mildew, a larger proportion of seed should be given, at whatever time or season it may be sown. Much less seed is likewise necessary in early than in late sowings. On the rich soils of Gloucestershire they generally sow seven pecks, and from eight to twelve in Yorkshire. Where the lands are in a proper state of tillage for receiving crops of this grain, ten pecks have been advised by a practical writer as the medium proportion; but much larger quantities are frequently sown in the northern parts of the kingdom. It is obvious, however, that where such large proportions of seed are made use of, the plants must be liable to be drawn up too much, and the crops in consequence to become weak, the ears being smaller and imperfectly filled. There may be also disadvantages from making use of too small proportions of seed, from the ground not being properly covered with plants; but where care is taken in the after-culture of the

crops, less danger may be apprehended from this than from any other extreme, as a great number of plants will be supplied by the tillering or shooting out of new stems from the joints about the surface, in consequence of the mould being laid up against them. The quantity usually sown in Hertfordshire, in the broadcast method, is two or three bushels; but in the county of Norfolk they sow broadcast from two to two and a half bushels; and in the drilling and dibbling methods from five to six or seven pecks. In Essex they sow broadcast about two bushels and half; and from seven to ten pecks in the drilling and dibbling methods. A large quantity of seed is sown in Sussex; some, four bushels on ley-land, and three upon tilth; others, three and a half: but when this crop succeeds Peas at an early time, they sow only three, which is the medium quantity; but, if late, more. In Berks, from two and a half to three bushels are generally sown in the broadcast sowings of this crop; and, in Oxfordshire, two, two and a half, and sometimes three bushels. The depth of putting in the seed should not generally be more than from one to two or three inches; and the best farmers change their seed-wheat frequently. A soon as the seed has been put into the land, it should constantly be laid as dry as possible by the construction of proper drains and water-furrows; so as in all seasons to keep the water from stagnating upon it.—In the culture of Wheat, after it has been put into the soil, there may be some difference, according as it has been sown, or to the preparation of the land, with other circumstances; but in all cases it should be kept perfectly clean and free from weeds, either by the horse or hand hoe, as weeds not only injure the crop in its growth, but lessen the value of the sample when brought to market. The stirring of the mould also on the surface among the plants, may frequently be useful in other ways, in addition to that of preventing the growth of seed-weeds; for as in the heavy kinds of soils that are most adapted to this grain, the more superficial parts are liable to become so hard and baked as not to be easily penetrated by the newly-formed or coronal roots of the plants in the early spring months, especially when they are very dry, and have been preceded by much wet, loosening of the earth by any means whatever must be very beneficial. The effect of its becoming hard, and baked, is shewn by the unhealthy yellow colour, and slow growth of the crop; and in that case it has been suggested that harrowing once or oftener in a place may be of much service in the early spring months. Where the crops are thin, and of feeble growth, the operation may produce good effects, by affording a sort of earthing up to the weak plants, and thereby promoting a more vigorous growth, at the same time that a number of new shoots are sent off from the joints thus covered, and the crop becomes full and abundant. It has been observed by a late writer, that the practice of scarifying the young drilled Wheat-crops should constantly be performed in February, and not later than March; but that some have not supposed it to be so very beneficial, from not having performed it at the proper time. And the drilled and dibbled crops, where this method is not employed, particularly in the latter mode, where only one row is placed on a flag, must be hand-hoed in the interval, the first time in the beginning of the above month, and a second time towards the end of it, or a little later. The business of thistling the Wheat-crops should also be carefully performed in May, or in the very early part of the following month, in all cases where it may be necessary. The practice of rolling should also be employed without having recourse to the harrow, or, after it has been used, being highly beneficial where the surface is cloddy, and the operation is executed when the ground possesses a medium degree of moisture, as well by forcing the roots of the Wheat into the earth, as by causing the new stems to rise. And in thin light soils, when this sort of grain is cultivated upon them, much benefit may also be produced in this way by the roots of the plants being prevented from being so easily loosened and thrown out of the ground. In cases where the land is not in a sufficient state of fertility or preparation to bring the crops to perfection, some persons make use of top-dressings, and employ both fluid and solid manures. The fluid sort consists principally of the draining of dunghills, and the solid of various kinds of birds' dung, bone-dust, soot, peat-ashes, and saline matters. The latter should be thinly sown over the crops with as much evenness as possible, as early in the spring as horses can without injury be admitted upon the land; and if it can be performed when the weather seems inclined to be moist, that will be an advantage, and a roller may then be passed over the crop with good effects. Where the former substances are used, it will be necessary to take care that the plants be not injured by the application of too large a quantity. The proper season for performing this business is February. It has also been suggested, that the method of transplanting Wheat may be had recourse to in particular cases, as, where there are some parts of such crops too thickly set upon the ground, while others are too thin, irregular, or patchy; for by thinning and setting out the crowded plants, the whole produce will be greatly improved. When Wheat is raised in the garden, one acre will produce sets enough to plant a hundred, when planted after being properly divided at the distance of nine inches from each other; and as the business of transplanting is to be performed in the spring, it is supposed that crops may be raised in this manner on land possessing more moisture than is likely to produce healthy Wheat in general. Besides, clean crops may be produced in this way with much greater certainty, as, where the ground is ploughed over just before the plants are set out, the grain may rise much quicker from them than the weeds from their seeds, which are overpowered by the crop. The custom of feeding down Wheat-crops, where too forward or luxuriant in the early spring months, by means of sheep, is a practice often found to improve the produce. The good effects are supposed to arise from the removal of the upright central stems, by which means different new lateral stems, or root-scions, are sent off or brought forward with more vigour by the acquisition of a larger proportion of nutritious matter from the joints, in consequence, that must otherwise have been exhausted in supporting the central stems. This method, however, is found to succeed best on such strong and fertile lands as are apt to produce a larger proportion of straw than can be properly supported. In which cases, advantage has been said to be derived by feeding off the blade at two or more successive times; but, in effecting the business, great care is necessary to see that the whole is completed before the crop begins to spindle, otherwise more injury than good may be produced. On the poor sort of ground this practice must be employed with great caution, as it often will retard the growth of the grain; and on lands where the crops are thin, the sheep may injure them by biting too closely. The animals ought not therefore to remain upon the crops in wet weather, when the surface of the ground is much loosened; nor after sudden frosts and thaws, when they are very likely to pull up and destroy the plants. On the other hand, the treading of the animals may prove very serviceable in all the light sorts of Wheat-land, where the crops are thin; as they not only press the earth more closely about the roots of the plants, but the stems in many instances will be so forced into the ground, and covered up, that new shoots will be

sent off laterally, and they will render the crop fuller on the land. But where the soils are very stiff and adhesive, the growth of the crops may be checked and retarded by the practice, and of course the shoots thus caused become weak, affording only small ears and light grain.—Some farmers contend that much advantage is derived from turning sheep upon crops where danger is apprehended from worms, slugs, and other insects; in order that by keeping them constantly in motion, such animals may either be wholly destroyed, or so fixed in the surface-mould as to cause their more gradual death. There is a great variety of these animals, which are supposed to be injurious to Wheat as well as other crops, and for the destruction of which, lime, soot, and other saline matters, have been had recourse to with supposed advantage. The weeds most injurious to Wheat-crops where they have been sown upon lands in an imperfect state of preparation, are Charlock on the light calcareous soils; the Corn-poppy on those of the chalky kind, which are also infested by Cockle, White-darnel, Packneedle, and Couch; and Colt's-foot on the heavy kinds of soil.—*Dibbling.* The instrument employed in this operation is called a pair of Dibbling-Irons: it consists of three parts, two irons for making the set-holes, and a connecting bar, which, for the purpose it serves, may be called the foot-bar. Each of the irons is about a yard long, with a handle like that of a spade. The shaft is about half an inch thick; the bottom part, with which the holes are made, is much like a plumber's soldering-iron, but smaller and more pointed. The foot-bar rests above the bottom parts with which the holes are made, and keeps them at the distance of five inches. When united, they form one compact instrument, and yet so loose as to allow each iron to be turned round with a quick motion of the hand at each step. The twist thus given to the irons, on taking them up from the set-holes, prevents the soil adhering to the instrument. The ground designed to be dibbled is first prepared as for broadcast. The man stretches a line where it may be convenient to begin, and then proceeds to make the holes, with one foot on the bar, advancing by steps of three inches, till he arrives at the end of the line, which he removes five inches, and then proceeds as before. This being done with exactness, will at length divide the whole field into neat squares of five inches by three. Two children follow the man, dropping three or four seeds into each hole. In the evening the seed is covered by using a garden rake or bush-harrow. The advantages of dibbling are stated to be, a saving of two-thirds of the seed required for broadcast; a greater product of grain, and of better quality; less unnecessary straw, by which the land is impoverished; the roots striking deeper into the ground, are not liable to be heaved out by the frost; the stems being at regular distances, they are less liable to be laid by heavy rains; and, lastly, as affording employment to the poor. The following method of preparing the seed will generally prevent rust or mildew, and smut; it also renders the crop more excellent. After washing the seed, and skimming off all the light grains, soak it in a strong solution of common salt, or in the drainings from a manure heap, twenty-four hours: then take it out, and dry it, by adding to it, while wet, fallen lime and soot, in equal quantities, stirring the whole till none of the seeds stick together. The seed thus prepared, must be set in twelve or eighteen hours afterwards, or it will not grow. Dibbling appears to be well adapted for mountainous districts, and may be performed for about seven shillings per acre.——Wheat is known to be ripe and ready for the reaper by the straw turning of a yellow colour; its ears beginning to bend in the neck, and hang down; there being no greenness in the middle of them, and the grain becoming hard and plump. When the Wheat-crops are very heavy, with broad luxuriant leaves, men with sickles move regularly through it, and strike off many of them, for lightening the top, as a preservative against their being beaten down by rain. This practice, which is called fagging, should be carefully performed, or much damage may ensue. —The Chinese method of preparing seeds before sowing them, though well known, has been hitherto unaccountably neglected in Europe. It has been successfully tried in the following process. Mix together equal parts of the dung of sheep, horses, and cows, and clayey earth; dilute the whole with water, which has been previously boiled, to kill the insects, and deprive it of its putrifying property. This mixture must be poured on the seed-corn while lukewarm, throwing a little slaked lime over it, and stirring the grain till a coating of the mixture is formed, and adheres to it. It must then be laid under a large woollen covering, and will swell and begin to germinate at the end of three days. Wheat thus prepared was sown two months and a half after the usual time, on the 22d of December, in one fourth less than the usual quantity; which appeared above ground in six days, and produced a fine crop in the beginning of August. The seed should be procured, if possible, from more southern countries than that wherein it is intended to be sown. Carrot-seed also has been prepared in a similar manner, with the addition of some soot, and left in a very humid state, wrapped in linen, in some manure that retained a mild heat internally. In six days the grain was ready to germinate, and was then mixed with ten times its quantity of sandy earth, and sowed. The Carrots appeared in ten days, and covered the ground so well that the weeds did not shew themselves. They were thinned two months afterwards, and yielded eleven large cart-loads per acre four months and a half after sowing. Barberry-trees have, during a series of years, overlooked fields of Wheat, without the smallest perceptible evil influence, although they are suspected to be of a noxious quality, and have been themselves blighted and mildewed, whilst the adjoining corn remained unaffected. The Barberry-tree is extremely susceptible of blight, and has been seen covered with mildew, before the corn was much or at all affected; and it appears probable that the same cause, viz. the atmospheric stroke, operate upon both.—*Produce.* The quantity of Wheat produced upon an acre must vary considerably, according to the circumstances of soil and preparation, as well as the state of the season; for it has been found that in some years the yield is under twenty, while in others it is upwards of thirty bushels per acre, upon the same land, and with the same cultivation. The average return of this crop throughout the kingdom is probably not more than from three to three and a half quarters. It is observed that the yield of several years varies the proportion which Wheat bears to the straw in a very great degree, but that the average is about twelve bushels of Wheat to each load of straw, weighing 11 cwt. 2 qrs. 8 lbs. It has been asserted, and probably with truth, that the straw of autumnal-sown Wheat is more harsh, and less agreeable to cattle, than the straw of that which is sown in the spring. The weight of Wheat by the bushel differs much in different cases; but in most strong-land districts, it is usually about sixty-two or sixty-three pounds to that quantity. The yield is the greatest at the time of reaping, and becomes successively less and less the longer it is kept, so as ultimately in many cases to prove a disadvantage to the farmer, sometimes to the amount of a shilling per bushel. It may be noticed, that it is necessary, with the view of ascertaining the goodness of a sample of Wheat, to determine by the eye, whether the berry be

perfectly fed, or full, plump, and bright, and whether there be any adulteration proceeding from sprouted grains, smut, or the seeds of weeds; and by the smell, whether there be any improper impregnation, and whether it has been too much heated in the mow or upon the kiln; and finally, by the feel, to decide if the grain be sufficiently dry, as when much loaded with moisture it is improper for the uses of the miller and baker. In cases where a sample handles coarse, rough, and does not slip readily in the hand, it may be concluded not to be in a condition either for grinding or keeping.

3. Triticum Compositum; *Many-spiked Wheat.* Spikes compound; spikelets crowded; corollas awned; awns three or four inches long; glumes smooth. It is suspected to be a variety of the preceding species.—Native of Egypt, cultivated at Naples.

4. Triticum Turgidum; *Turgid* or *Cone Wheat.* Calix four-flowered, tumid, villose, imbricated, obtuse, with a short point. The corolla varies with or without long awns. The silky or villose glumes alone distinguish this from the varieties of the second species.—Native country unknown.

5. Triticum Polonicum; *Polish Wheat.* Calix three or four flowered, pointed, naked, lanceolate, like the corolla, which is compressed, with a long awn. That this is a distinct species there can be no doubt: the strength of the whole plant, its large ears, and long narrow scarcely tumid glumes, readily distinguish it at first sight. It was cultivated in this country at the latter part of the seventeenth century, and is still retained by the curious in botanic gardens; but being easily laid by rain, is not so much valued by the farmer.—Native country unknown.

6. Triticum Spelta; *Spelt Wheat.* Calix imperfectly four-flowered, elliptical, obliquely pointed, shorter than the long awned corolla. The glumes are very glaucous. It is chiefly cultivated in the south of Europe, and is given to horses in Spain, when Barley is scarce. It makes but a dry bread, yet is excellent for pastry.—Native country unknown.

7. Triticum Monococcum; *Single-grained Wheat*, or *St. Peter's Corn.* Calix angular, strongly toothed, about three-flowered; first floret awned, intermediate one imperfect. This species is cultivated in the most mountainous parts of Switzerland. The neat quadrangular form of the ripe ear, as if carved out of ivory, is remarkable. The straw is hard, firm, fit for thatching; and the flour rather better than that of the preceding, making good, though not white bread, and being chiefly esteemed for gruel.—Native country unknown.

8. Triticum Prostratum; *Trailing Wheat-Grass.* Spike ovate, compressed, two-ranked; glumes of the calix and corolla strongly keeled, longer than their awns. A hardy annual, flowering in June. The spikes sometimes fall off entire, and vegetate in the sand, producing a tuft of decumbent slender plants, from three to six inches long, with narrow slightly downy leaves; they are solitary, terminal, about half an inch long, smooth; spikelets ten or twelve, closely imbricated, furrowed, incurved; awns of the calix awl-shaped, nearly as long as those of the corolla.—Found in the most barren sandy deserts near the Caspian Sea.

9. Triticum Tenellum; *Dwarf Wheat-Grass.* Spike simple, linear; spikelets alternate, elliptic-lanceolate, awnless; calix furrowed; corolla even, emarginate; leaves bristle-shaped. Root annual, of a few woolly fibres; stems one or more, erect, straight, from four to eighteen inches high, scarcely branched, leafy, with several dark brown joints.—Native of Switzerland and the south of France.

10. Triticum Unilaterale; *Unilateral Wheat-Grass.* Spike simple, linear; spikelets alternate, close, turned to one side; calix unequal, taper-pointed; corolla short-awned, smooth. Root annual, of many capillary fibres, partly downy; stems numerous, a span high, scarcely branched, smooth, leafy; leaves narrow, channelled, ribbed; spikes solitary, long, slender, curved, of numerous close spikelets.—Native of Syria, Italy, and the south of France.

11. Triticum Hispanicum; *Little Spanish Wheat-Grass.* Spike simple, linear; spikelets alternate, close, turned to one side; glumes all downy; calix unequal, taper-pointed; corolla with an awn exceeding its own length. Suspected to to be a mere variety of the last species.—Found in Spain.

12. Triticum Maritimum; *Sea Wheat-Grass.* Spikes panicled; spikelets many-flowered, compressed; florets linear-lanceolate, ribbed, pointed, awnless. Root annual, of many woolly fibres; stems branched from the base, leafy, a foot high, more or less bent at the joints, and partly decumbent; often purplish, as well as the sheaths of the leaves, and branches of the panicle; leaves longish and tapering, narrow, striated, smooth; sheaths broader than the leaves, but much shorter; stipula membranous, torn, decurrent; panicle about three inches long, forked, with many spreading, spiked, triangular, smooth branches.—Native of sea-coasts of the south of France, Greece, and Egypt.

13. Triticum Loliaceum; *Dwarf Sea Wheat-Grass.* Spike mostly simple, unilateral; spikelets many-flowered, compressed; florets elliptical, obtuse, awnless, with marginal ribs; stem branched; root annual. This is very nearly allied to *Poa Rigida;* nor is the position of their spikelets dissimilar.—Found upon the sandy sea-beach on the east and south coasts of England, as well as in Italy.

14. Triticum Unioloides; *Elegant Wheat-Grass.* Spike simple, close; spikelets many-flowered, ovate, compressed; florets closely imbricated, ovate, acute, keeled, awnless, with central lateral ribs. Stems mostly simple, a span high, sometimes purple; leaves lanceolate, taper-pointed, flat. It is an annual, and most elegant grass, remarkable for its large, flat, closely imbricated, sharp-edged spikelets, which resemble those of *Poa Eragrostis.*—Found on the sea-coasts of Italy, Sicily, and Barbary.

** *Root Perennial.*

15. Triticum Junceum; *Sea Rushy Wheat-Grass.* Calix abrupt, five-flowered; leaves involute, sharp-pointed; root creeping. The roots being long, stringy, and tough, and fixed by woolly fibres, co-operate with *Carex Arenaria, Elymus Arenarius,* &c. in fixing the sand, and forming a barrier against the encroachments of the ocean. The whole plant is very glaucous, hard, and rigid, with spinous pointed leaves, strongly furrowed on their upper side; stems two feet high, very smooth, often tinged with violet in the lower part, and very smooth; spikes solitary, of several alternate flat spikelets.—Found on all the sandy shores of Europe.

16. Triticum Distichum; *Two-ranked Cape Wheat-Grass.* Calix four-flowered, smooth, awnless; flowers two-ranked; leaves thread-shaped.—Native of the Cape.

17. Triticum Repens; *Creeping Wheat-Grass*, or *Couch Grass.* Calix awl-shaped, many-ribbed, five-flowered; florets pointed; leaves flat; root creeping. Stems two feet high, slender; herbage green, except in the maritime variety; spikes two or three inches long, smaller in every part than those of the 15th species.—This grass is too common in all kinds of cultivated ground throughout Europe, flowering in summer and autumn. Its long and deeply creeping roots are of all things the most difficult to destroy; yet when collected in sufficient quantities, they afford wholesome nourishment for cattle, and in some countries have been made into bread in famines.

18. Triticum Caninum; *Fibrous* or *Bearded Wheat-Grass.* Calix pointed, about five-ribbed, four-flowered; florets awned; leaves flat. Root fibrous, downy, not at all creeping; herbage light green, not glaucous; stem two feet high, erect, straight, finely striated, leafy; spikes solitary, two to four inches long, a little drooping when ripe.—Native of bushy places in various parts of Europe. In England it prefers a calcareous soil, flowering in July.

19. Triticum Cristatum; *Crested Wheat-Grass.* Calix elliptical, awned, keeled, obscurely ribbed; florets awned; spikelets closely imbricated, two-ranked, depressed, straight. Stems simple, twelve or eighteen inches high, ascending, slender, rigid, leafy, hairy at the top. The roots are perennial, with very long strong woolly fibres, destined to grow in sand. —Common in Siberia and Tartary; found also near Arbroath in Scotland.

20. Triticum Attenuatum; *Slender American Wheat-Grass.* Calix lanceolate, bluntish, five-ribbed, roughish, three-flowered; florets very slightly awned; spikelets distant. Root fibrous; stems simple, three or four feet high, smooth; leaves linear, flat, with a short stipula; spike erect, five or six inches long.—It is found in dry open parts of Quito, flowering in January.

21. Triticum Scabrum; *Rough New Holland Wheat-Grass.* Spike elongated, lax; calix lanceolate, ribbed, pointed, many-flowered, half the length of the corolla; florets rough, taper-pointed, shorter than their awns. Stems slender, erect, eighteen inches high, smooth; leaves narrow, hairy, flat, rough, with smooth sheaths; root apparently perennial, with thick downy fibres, not creeping.—Native of New South Wales, and the Cape of Van Diemen.

22. Triticum Pectinatum; *Pectinate New Holland Wheat-Grass.* Spikelets two-ranked, horizontally divaricated; calix awl-shaped, pointed, about six-flowered; awns shorter than the florets. Stems numerous, tufted, erect, simple, a foot or more in height; leaves flat, ciliated, narrow, hairy, fringed, and acutely pointed. The root is fibrous.—Found in the island of Van Diemen.

Triumfetta; a genus of the class Dodecandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved; leaflets lanceolate, arilled below the tip, deciduous. *Corolla:* petals five, linear, erect, obtuse, concave, bent backward just above the base. *Stamina:* filamenta sixteen, equal, ascending, length of the corolla, awl-shaped, erect; antheræ simple. *Pistil:* germen roundish; style length of the stamina; stigma bifid, acute. *Pericarp:* capsule globular, fenced on every side with hooked prickles, four-celled. *Seeds:* one or two in each cell, convex on one side, angular on the other. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled. *Capsule:* hispid, opening in four parts. ——The species are,

1. Triumfetta Lappula; *Prickly-seeded Triumfetta.* Leaves emarginate at the base; flowers in densely whorled aggregate spikes. Stem upright, six or seven feet high, becoming woody, and dividing at top into four or five branches. The branches are terminated by long spikes of flowers, which come out in clusters from the side of the principal footstalk, at the distances of about an inch. The flowers are small, the petals narrow, and of a yellow colour; and are succeeded by burry capsules somewhat like those of Agrimony, but round, and with longer prickles placed on every side. It flowers in July and August, and in warm seasons the seeds sometimes ripen in England.—Native of Jamaica, Martinico, and other islands of the West Indies, the Bermudas, and Brazil. Sow the seeds on a hot-bed early in the spring; when the plants come up, transplant each into a separate pot, filled with light fresh kitchen-garden earth, and plunge them into a moderate hot-bed of tanners' bark, shading them from the sun until they have taken new root, and then treating them in the same manner as other tender exotic plants. In autumn remove them into the bark-stove, and refresh them with water frequently, except in very cold weather. If they survive the winter, they will flower in the summer following, and ripen their seeds in autumn, and may be continued two or three years, if carefully managed.

2. Triumfetta Glandulosa; *Glandular Triumfetta.* Leaves ovate-lanceolate, tomentose, hoary beneath; flowers axillary, from the upper leaves; branches woody, round, villose. It differs from the fourth species in having the leaves only half the width, not angular towards the outside, acute, not acuminate, with the hairs beneath more distinct, and the stipules setaceous, subulate.—Native of Arabia Felix and India.

3. Triumfetta Bartramia; *Currant-leaved Triumfetta.* Leaves entire at the base, undivided; flowers racemose, partly aggregate, the lower ones axillary. Root annual; flowers small, purple, or rose-coloured; capsule spherical, white, tomentose, echinated, with bristle-shaped, hooked, smooth little prickles, four-grained, quadripartile; grains coriaceous, convex on one side, angular on the other, two-celled, valveless, growing to the seeds; seeds solitary, two in each grain, and eight in the whole, from an ovate drawn to a point upwards, convex on one side, angular on the other, rufescent. Sometimes the capsules are only three-grained, and tripartile; others may easily be divided into six or eight parts, each seed being covered with its proper cell, as in Marraceæ.—Native of the East Indies.

4. Triumfetta Velutina; *Velvet Triumfetta.* Leaves ovate, somewhat angular, acuminate, tomentose, hoary beneath; stem erect, softly villose, round; stipules lanceolate, attenuated, ciliate, ferruginous; flowers from the bosoms of the upper leaves.—Native of the Isle of France.

5. Triumfetta Procumbens; *Procumbent Triumfetta.* Leaves roundish-cordate, subtrilobate, tomentose; stem procumbent. —Native of the Society Isles.

6. Triumfetta Hirta; *Hairy Triumfetta.* Leaves three-lobed, acute; smooth above; panicle terminal, dichotomous, rough-haired; stem frutescent.—Native of the island of Santa Martha in America.

7. Triumfetta Semitriloba; *Mallow-leaved Triumfetta.* Leaves half three-lobed; panicle terminal, compound, downy. This is an upright branching shrub, six feet high, and is so like the first species in its habit, that at first sight they might be easily mistaken. The flowers are yellow, not many together. The leaves and tender buds infused in water, yield a fine clear mucilage; from which the plant is thought to be a good emollient. The bark is tough and strong, and serves for ropes, and other things of that kind, in the West Indies, where it is a native, and flowers in July.

8. Triumfetta Grandiflora; *Great-flowered Triumfetta.* Leaves subcordate-ovate, entire, serrate, somewhat hairy; floral leaves lanceolate; branches rough-haired. Stem woody, round, with the branches smooth below, rough-haired above, bifid at the end. It differs from the other species in having the corollas twice or thrice as large; stipules lanceolate, acuminate.—Native of Montserrat.

9. Triumfetta Macrophylla; *Long-leaved Triumfetta.* Leaves ovate-cordate, entire, unequally serrate, acuminate, tomentose, glandular at the base; branches round and tomentose, as is the whole plant. It resembles the first species; and may be distinguished from the next by the form and tomentoseness of the leaves.—Native of South America.

10. Triumfetta Rhombifolia; *Rhomb-leaved Triumfetta.* Leaves rhomboid, the upper ones lanceolate-ovate; flowers in axillary tufts. This is an upright branching shrub, three feet in height, the whole, especially the seeds, having an unpleasant smell. The French call it *Cousin*, on account of the capsules adhering to the clothes.—Native of the West Indies.

11. Triumfetta Annua; *Annual Triumfetta.* Leaves ovate, acute, undivided, sometimes, but rarely, lobed. This is an annual plant, rising about two feet and a half high, and sending out several branches on every side. The flowers come out in long loose spikes at the top of the plant; they are small and yellow.—Native of India.

Trixis; a genus of the class Syngenesia, order Polygamia-Necessaria.—Generic Character. *Calix:* common, imbricate, ovate; scales eight to ten, oblong, acuminate, convex, almost equal; outer somewhat keeled, membranous at the tip. *Corolla:* compound; corollets hermaphrodite, numerous, in the disk; females fewer, shorter, in the ray; proper in the hermaphrodites funnel-form, with a very short tube, and an erect five-cleft border; in the females funnel-form, with a compressed tube and a trifid border; the hinder segment larger, the anterior ones smaller. *Stamina:* in the hermaphrodites, filamenta five, length of the tube; anthera cylindrical, above the border. *Pistil:* in the hermaphrodites, germen linear, pubescent; style filiform, length of the stamina, bifid at the tip; stigmas reflexed: in the female florets, germen oblong; style filiform, divided at the top; stigmas reflexed. *Pericarp:* none; calix unchanged, converging. *Seeds:* in the hermaphrodites often abortive; in the females ovate, somewhat compressed, margined, convex behind, blunt at the tip, subtrigonal, hirsute; down none. *Receptacle:* chaffy; chaffs oblong, acute, concave, membranaceous. Essential Character. *Corollets* of the ray trifid. *Seeds:* hairy at the tip, without any down. *Receptacle:* chaffy. ——The species are,

1. Trixis Terenbinthinaceæ. Leaves ovate, serrulate, hispid, hirsute beneath; flowers corymbed. Stem shrubby, two yards high, rough; with opposite, round, leafy branches, rough with very dense, short, rigid hairs, as are also the footstalks; flowers numerous, small, white.—Native of Jamaica.

2. Trixis Aspera. Leaves ovate, attenuated at the base and tip, tooth-serrate, rough; branches silky; flowers panicled.—Native of the West Indies.

3. Trixis Erosa. Leaves broad, ovate, gash-serrate, wrinkled, rugged, pale beneath; branches bristly.—Native of Dominica and St. Christopher's.

Trollius; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* none. *Corolla:* petals about fourteen, subovate, deciduous, three in each outer row, in the inmost five; nectaries nine, linear, flat, curved in, perforated at the base inwards. *Stamina:* filamenta numerous, bristle-shaped, shorter than the corolla; antheræ linear, erect. *Pistil:* germina numerous, sessile, columnar; style short; stigmas mucronate, shorter than the stamina. *Pericarp:* capsules numerous, collected into a head, ovate, with a point, curved back, bursting at the inner edge, one-celled. *Seeds:* numerous, obovate, angular, polished, inserted along the inner edge of each valve. Essential Character. *Calix:* none. *Petals:* about fourteen. *Capsules:* numerous, ovate, many-seeded.——The species are,

1. Trollius Europæus; *European Globe-flower, Globe Ranunculus, Globe Crowfoot,* or *Lucken-gowan's.* Corollas converging; nectaries length of the stamina. Root perennial, fibrous, black; stalk two feet high, smooth, hollow, branching towards the top. Each branch is terminated by one large yellow flower, without a calix, and shaped like that of Crowfoot. Leaves many-parted, pinnatifid, gashed, smooth; the lower ones on long petioles.—Native of the North of Europe, Carniola, Dauphiny, Piedmont, and Siberia. It is found in the northern counties of England, also in Scotland and Wales, on the sides of mountains, and in mountainous meadows and moist shady places. In the southern parts of Great Britain it only occurs in gardens. It flowers in the end of May and beginning of June. This splendid flower, says Linneus, adorns the pavements of the rustics on festival days. Allan Ramsay, in his *Gentle Shepherd*, makes the young laird wish to gather these flowers to weave a chaplet for his Katie's brow; and in Westmoreland this plant is collected with great festivity by the youth of both sexes, about the beginning of June; at which time it is usual to see them return from the woods in the evening, laden with it, to adorn their doors and cottages with wreaths and garlands.—Part the roots at the end of September, when the leaves are beginning to decay, planting them at a foot distance, in a shady situation and a moist soil. They should not be parted into too small divisions, nor oftener than once in three years.

2. Trollius Asiaticus; *Asiatic Globe-flower.* Corollas spreading; nectaries longer than the stamina. This differs from the former species in having larger leaves, of a lighter green colour, with fewer and larger segments, resembling those of Yellow Monk's Hood. The petals spread open, not converging at their points, like those of the first species. The corolla, stamina, and nectaries, are of an elegant saffron colour.—Native of Siberia, flowering in May and June. It may be increased and treated like the first species, but requires a moister soil, and a shady situation, but not under the drip of trees: it thrives best on a north border, where the soil is loamy, but not too stiff. In a dry soil, or much exposed to the sun, the plants frequently die in summer, but may be maintained in a flourishing state by covering the ground with Moss. It should be planted in a composition of loam and bog earth, in a north border, taking care that it does not suffer from want of watering in dry summers. It may be raised from seeds, which frequently ripen on strong healthy plants. As the flowers of both these plants make a pretty appearance, they deserve a place in every good garden, especially as they will thrive in moist shady places, where few better plants will live.

3. Trollius Laxus. Petals five, obtuse, patulous; nectaries shorter than the stamina; flowers yellow.—Grows in shady wet places, on the mountains of New York and Pennsylvania, flowering in May.

Tropæolum; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-cleft, from upright spreading, acute, coloured, deciduous; the two lower segments narrower, horned at the back with an awl-shaped, straight, longer nectary. *Corolla:* petals five, roundish, inserted into the divisions of the calix; two upper sessile, the others lower, with oblong ciliate claws. *Stamina:* filamenta eight, awl-shaped, short, declining, unequal; antheræ erect, oblong, rising. *Pistil:* germen roundish, three-lobed, striated; style simple, erect, length of the stamina; stigma trifid, acute. *Pericarp:* berries or nuts somewhat solid, three, on one side convex, grooved, and striated, on the other angular. *Seeds:* three, gibbous on one side, angular on the other, roundish, grooved, and striated. Essential Character. *Calix:* one-leafed, with a nectariferous spur. *Petals:* four, unequal. *Nuts:* three, coriaceous.——The species are,

1. Tropæolum Minus; *Small Indian Cress.* Leaves peltate, subrepand, mucronate; petals acute. Stem herbaceous, trailing; flowers axillary, on very long peduncles. There are two varieties of this species, one with a deep orange-coloured flower inclined to red, and the other with a pale yellow flower. The whole plant has a hot pungent taste, resembling Cresses of various kinds.—Native of Peru. Sow the seeds of this, and of the next species, in April, where they are to remain, which should be where their stalks may have support. The varieties with double flowers are continued by cuttings, and are kept under shelter all winter. The first species should be raised on a hot-bed like all other tender annuals, if we wish to have it flower early in the summer, continue long in blossom, and produce perfect seeds; but it will grow readily in the open air in warm sheltered situations. The greater sort may also be brought forward in a hot-bed, if the flowers or fruit are wanted for use. But plants will come up spontaneously from seeds dropped in the autumn; which is rather extraordinary in a Peruvian plant.

2. Tropæolum Majus; *Great Indian Cress.* Leaves peltate, repand; petals obtuse. This has two varieties, like the first species, and a third with double flowers. The flowers, like every other part of the plant, are larger, and make a finer appearance, than those of the preceding; hence it probably occasioned the former to be neglected. The stalks of both will climb six or eight feet high, when they are trained up, and thus the flowers make a good appearance; but when they trail upon the ground, they will spread over the neighbouring plants, and become unsightly. The flowers are eaten in salads; and having a warm taste, like the Garden Cress, the plant has acquired the common name of Nasturtium. It is also used for garnishing dishes. The seeds are pickled, and by some are preferred to most pickles for sauce, under the false name of Capers. Linneus informs us, that his daughter observed the flowers of this plant at certain intervals to emit sparks spontaneously, which appeared to be electrical, and were only visible in the evening.—This is also a native of Peru, and is reckoned an annual plant: both may be continued through the winter, if they are kept in pots, and sheltered in a green-house or glass-case, in like manner as the variety with double flowers is preserved. It begins to flower in July, and continues till the approach of winter.

3. Tropæolum Hybridum; *Bastard Indian Cress.* Leaves subpeltate, five-lobed; lobes obtuse, subrepand; petals wedge-toothed at the tip.—This is suspected to be a mere variety. It can seldom be increased by seeds, but by slips and cuttings.

4. Tropæolum Peregrinum; *Fringe-flowered Indian Cress.* Leaves subpeltate, five-lobed, palmate, somewhat toothed; petals laciniated. Root annual. It flowers in September and October.—Native of Peru.

5. Tropæolum Pentaphyllum; *Five-leaved Indian Cress.* Leaves quinate; leaflets quite entire, acute; petals shorter than the calix, quite entire, acute. Stem slender, clothed with numerous irregularly scattered leaves, on footstalks an inch long, climbing.—Native of Monte Video.

Trophis; a genus of the class Diœcia, order Tetrandria. —Generic Character. *Male. Calix:* none. *Corolla:* petals four, obtuse, spreading. *Stamina:* filamenta four, capillary, longer than the corolla; antheræ of two globular lobes. *Female*, on a distinct tree. *Calix:* one-leafed, very small, closely investing the germen. *Corolla:* none. *Pistil:* germen ovate, four-celled; style filiform, short; stigmas two, awl-shaped, spreading. *Pericarp:* berry substriated, wrinkled, one-celled. *Seeds:* one to four, subglobular. Essential Character. *Male. Calix:* none. *Corolla:* four-petalled. *Female. Calix:* one-leafed. *Corolla:* none. *Stigmas:* two, awl-shaped. *Berry:* one to four seeded.—— The species are,

1. Trophis Americana; *The Ramoon Tree.* Thornless: leaves oblong, acuminate, with the point blunt, entire, beneath netted, veined, and paler; male flowers in peduncled roundish aments, an inch long, erect, axillary, subsolitary; flowers approximating, minute, whitish; female flowers in axillary racemes, two together, longer than the petioles, composed of seven or eight sessile alternate horizontal flowers. It is a tree, seldom exceeding twenty feet high, with nearly upright round even branches. The leaves and twigs make an agreeable wholesome fodder for all sorts of cattle, and are often used as such in dry seasons, in the inland woody parts of Jamaica, where grass is often very scarce. The berries, or drupes, as Swartz calls them, are generally about the size of large grapes, and of an agreeable pleasant flavour.—Native of the island of Jamaica, and most parts of the West Indies, in dry exposed situations.

2. Trophis Laurifolia. Without thorns: leaves elliptic-oblong, acute at each end, smooth, entire; berry two-horned, and two or four seeded. A tree, with thick roundish branches. —Native of Quito and New Grenada.

3. Trophis Aspera. Without thorns: leaves obovate, unequally serrated, very rough on both sides; petals four. —Native of Tranquebar, in woods and thickets.

4. Trophis Spinosa. Branches thorny; leaves elliptical, entire, smooth. The wood is used to dye yellow, and, with the addition of indigo, green.—Native of Java.

Truffles. See *Tuber.*

Trumpet Flower. See *Bignonia.*

Trumpet Honeysuckle. See *Lonicera.*

Tuber; a genus of the class Cryptogamia, order Fungi. Essential Character. Roundish, fleshy, solid, closed; its substance variegated with veins bearing seeds.—— The species are,

1. Tuber Cibarium; *Common Truffle.* Blackish, rough with prominent warts. It is about the size of a Walnut in its outer coat, the surface irregularly tumid, and harsh to the touch, being covered with innumerable sharp warts. The inner substance is grayish, or pale brown, with numerous curved branching veins, lodging the minute seeds. No roots have been discovered. There are several varieties, differing in colour. Dogs are taught to find this fungus by the smell, and to scratch it out of the earth. It is brought to table either simply boiled, or stewed in various forms. The French and Italians introduce it into made dishes, sauces, and pies. It is reported to possess a stimulating quality, which renders it more popular than its flavour, which is not very fine.—It is found underground, just below the surface, in light dry soils, in Europe, the East Indies, and Japan.

2. Tuber Moschata; *Musky Truffle.* Blackish and smooth. This resembles the preceding in general form and size; but it differs in having a smooth surface, soft internal substance, and musky scent. The dried coat becomes wrinkled.— Native of France.

3. Tuber Griseum; *Gray Truffle.* Roundish, irregular, smooth, soft, grayish ash-coloured. This is about the size of the first and second species, but more irregularly shaped; of a soapy texture and light colour, with a strong scent of Garlic. —Native of Piedmont, in light, moderately moist soils.

4. Tuber Album; *White Truffle.* Light reddish-brown, roundish, half above ground, with rusty-coloured veins. The outside smooth, turning yellow in drying; internal substance like rhubarb, with a disagreeable flavour. This species is found in woods, in England, France, and in Greece.—

Withering mentions a variety, or, as he observes, probably a distinct species. It has an uniform internal substance, like cork, but of the colour of tanned leather; the surface is knobbed and pitted, hairy in the pits. The whole mass was perforated by stems of grass; hence it must have appeared above the ground in a soft state.

5. Tuber Æstivum; *Summer Truffle.* Almost globular, smooth, brown, or blackish; spongy within; wholly subterraneous. These have little taste or smell, but are much used for the table. When young, the surface is whitish and scaly, but generally becomes brown or blackish. Their size is equal to a chestnut or walnut. Persoon thought it to be the same with the fourth species, or at least only a variety.—It abounds in Carinthia and Carniola, from May to August.

6. Tuber Cervinum; *Bastard Truffle.* Globular, finely granulated, rather solid, finely bursting, powdery in the centre. It is about an inch and half in diameter, outside tawny, internal substance purplish.—It occurs barely sunk in the ground in many parts of England, Bohemia, &c.

7. Tuber Solidum; *Hard Truffle.* Globular, but depressed, brown, reticulated, very firm, blue-black within.—It was found in Dr. Withering's park at Edgbaston near Birmingham, under an Oak tree by the pool, in August. It has a short root; and appears, however, to be a kind of *Lycoperdon.*

8. Tuber Radicatum; *Rooted Truffle.* Roundish, depressed, cracked in the surface, with a thick short root. Two or three inches in diameter, solid, never bursting, nor yet becoming internally powdery. The outer skin is brown or olive, cracking into angular portions, but not warty.—Found, but rarely, in the summer on heaths and in woods in Italy and England.

Tulbagia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* spathe two-valved, oblong, membranaceous, with the flowers peduncled. *Corolla:* petals six, lanceolate, length of the nectary, placed on the tube, three in the middle, three behind the border; nectary one-petalled, cylindrical, with the border six-parted, awl-shaped, spreading. *Stamina:* filamenta six, very short, three in the throat, three within the tube; antheræ somewhat oblong, acute. *Pistil:* germen superior, ovate; style cylindrical, short; stigma turbinate, hollow. *Pericarp:* capsule ovate, subtrigonal, three-celled, three-valved; partition contrary to the valves. *Seeds:* according to Gærtner, two in a cell. *Observe.* The corolla one-petalled, funnel-form, with a six-cleft border; nectary crowning the aperture, three-leaved; leaflets bifid. It cannot be associated with *Narcissus,* on account of its superior germen: the corolla bears more resemblance to the *Hyacinth.* Essential Character. *Corolla:* funnel-form, with a six-cleft border. *Nectary:* crowning the aperture, three-leaved; leaflets bifid, the size of the border. *Capsule:* superior. *Seeds:* compressed.——The species are,

1. Tulbagia Alliacea; *Narcissus-leaved Tulbagia.* Nectary one-leafed, six-toothed; root bulbous, with numerous thick subfusiform fibres; corolla one-petalled, tubular, green like the Oriental Hyacinth, with a small acute border. It flowers here in May, is of the height of the Snowdrop.—Native of the Cape.

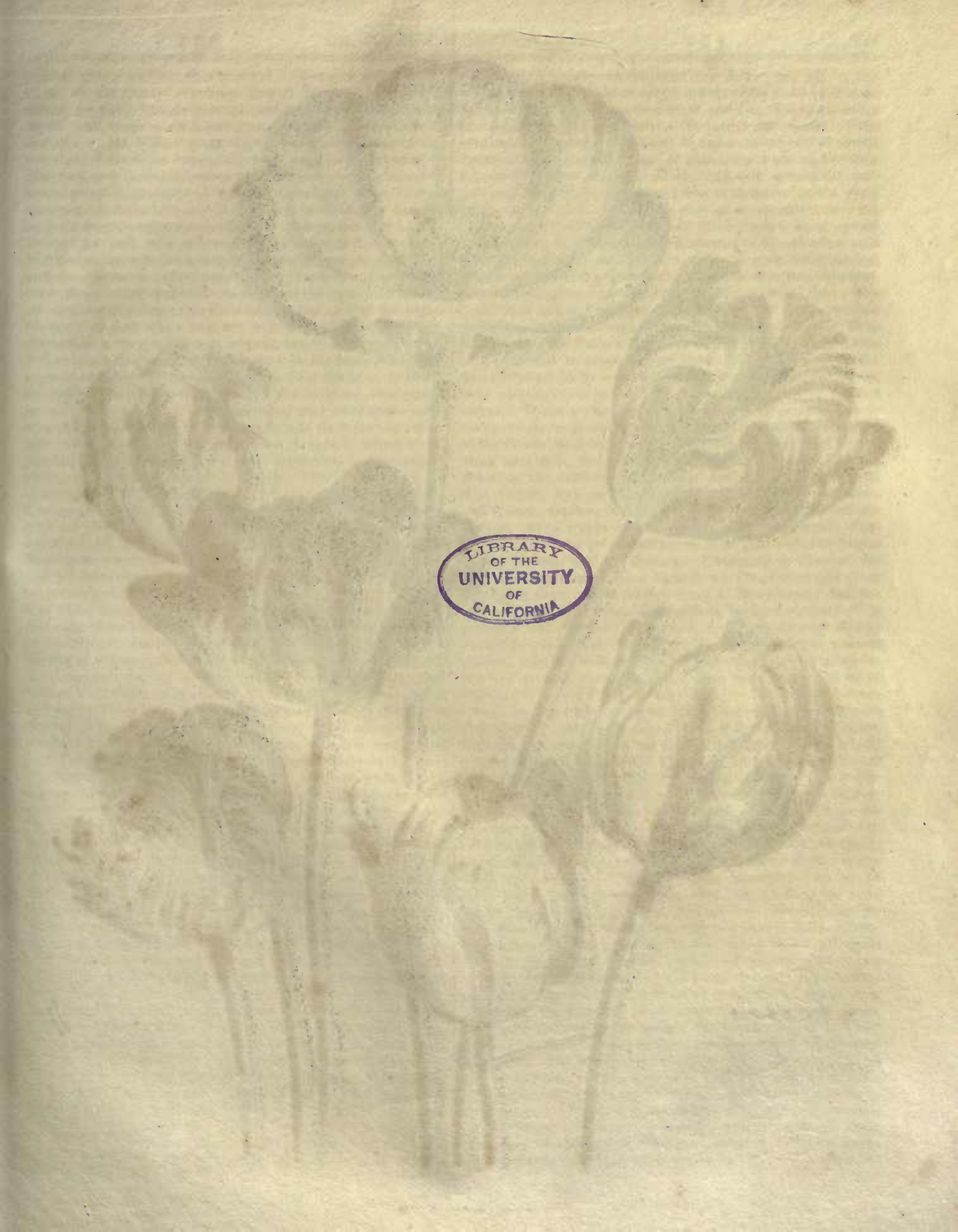
2. Tulbagia Cepacea; *Purple Tulbagia.* Nectary three-leaved; root bundled; leaves radical, from two to four, lanceolate-linear, somewhat fleshy; scape a span high; spathe umbelliferous, two-valved; flowers erect, purple. It differs from the first in being of smaller stature, and in having a three-leaved nectary.—Native of the Cape. This, and the foregoing, may be increased by sowing the seeds, slipping the branches, and offsets from the roots.

Tulipa; (so called from the resemblance of the flower to the eastern head-dress named Tulipan or Turban,) a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* bell-shaped; petals six, ovate-oblong, concave, erect. *Stamina:* filamenta six, awl-shaped, very short; antheræ quadrangular, oblong, erect, distant. *Pistil:* germen large, oblong, from three-cornered round; style none; stigma three-lobed, triangular; angles protuberant, bifid, permanent. *Pericarp:* capsule three-sided, three-celled, three-valved; valves ciliate at the edge, ovate. *Seeds:* numerous, flat, incumbent in a double row, semicircular, separated by scales of the same shape. Essential Character. *Corolla:* six-petalled, bell-shaped. *Style:* none. *Capsule:* three-celled. *Seeds:* flat.——The species are,

1. Tulipa Sylvestris; *Wild* or *Yellow Tulip.* Flower solitary, nodding a little; stigma obtuse, three-sided; stamina hairy at the base; leaves lanceolate. Bulb ovate, gibbous; stem quite simple, nearly upright, round, smooth, leafy in the middle, attenuated at the base. The circumstances which abundantly distinguish this are, the narrow leaves, the nodding flower, the hairiness at the base of the stamina, and on the tips of the petals, and especially the simple obtuse form of the stigma, which is totally different from that of the Garden Tulip: the flower is yellow, and fragrant; the pollen yellow, not black; and the anthera are remarkably long. Linneus observes, that the flower does not begin to open till about ten o'clock, whereas the Garden Tulip opens before eight. It grows in a bed of good mould above the chalk, the roots lying several inches below the surface, and flowers in April.—Native of the south of Europe, Germany, Switzerland; also of Siberia and Barbary. It has been found in chalk-pits near Bury St. Edmund's and Norwich; and at Whiponade on the borders of Hertfordshire and Bedfordshire. It was formerly preserved in the English gardens, but, since so many varieties of the third sort have been propagated, has fallen into disuse, and is only found in old gardens.

2. Tulipa Suaveolens; *Early Dwarf Tulip.* Stem one-flowered, pubescent; flower erect; petals obtuse, smooth; leaves ovate-lanceolate, downy above. The whole plant is of a dwarf stature, and glaucous hue. Flowers broad bell-shaped, sweet-scented; petals scarlet edged with yellow. It flowers in March or April.—Native of the south of Europe.

3. Tulipa Gesneriana; *Common Garden Tulip.* Stem one-flowered, smooth; flower erect; petals obtuse, smooth; leaves ovate-lanceolate. Before the fruit is fully ripe, the vibrissæ in this genus, and in that of Fritillaria, are glued together into three thin membranes, which, being interposed between the columns of seeds, make the unripe capsules six-celled.—No plant affords more varieties than the Tulip. Sometimes, but rarely, it has two flowers; six petals is the regular number, but it is not uncommon to find seven or eight; and the flowers are sometimes quite double. Some of the varieties produce their flowers earlier than the others; and the capsules are not very unfrequently four-sided and four-celled. But the most remarkable variation in the Tulip is in the colours of the petals, an almost infinite variety of these having been produced by art. The old authors divided Tulips into *Præcoces* or early-blowers, and *Serotinæ* or late-blowers, with an intermediate division of *Dubiæ Mediæ,* doubtful or middle-blowers, which flowered between the two others, and for the most part rather belonged to the late-blowers. Modern florists have almost neglected the early-blowers. These are not nearly so fair, nor do they rise half so high, as the late ones; but they are chiefly valued for appearing early in the spring; some of them will flower by the middle of March in mild seasons, if planted in a warm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TULIPA.

Variegated Tulips.

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border, near a wall or other shelter; and others will succeed them, so that they will keep flowering until the general season for these flowers is come, which is towards the end of April. As these early-blowers are few in comparison with the others, Mr. Miller gives the names of forty-one of the principal. By those names, the roots were to be obtained in Flanders and Holland, where the florists are very exact in keeping up their lists of flowers complete. The several varieties of early-blowing Tulips, rise to different heights in their stems, and scarcely any two of them are equal. The Duke Van Toll, (the second species,) which is one of the first that appears in the spring, is generally very short-stalked, and the others, in proportion to their earliness, are shorter than those which succeed them; and the late-blowers are all considerably longer in their stems than any of the early-blowers, so that when they are mixed together confusedly, they make a very indifferent appearance. The late-blowing Tulips producing much finer flowers than the early ones, have engrossed almost the whole attention of the florists. It would be to little purpose to enumerate all the varieties, since there is scarcely any end of their numbers, and what some value at a considerable rate, others reject; and as there are annually many new flowers obtained from breeders, those which are old, if they have not very good properties to recommend them, are thrown out and despised. The late-blowers are distributed into five families. 1. *Primo Baguets:* very tall; fine cups with white bottoms, well broken with fine brown, and all from the same breeder. 2. *Baguets Rigauts:* not quite so tall, but with strong stems, and very large well-formed cups with white bottoms, well broken with fine brown, and all from the same breeder. 3. *Incomparable Verports:* a particular kind of Byblœmens, with most perfect cups, very fine white bottoms, well broken with shining brown, and all from the same breeder. 4. *Byblœmens:* with bottoms white, or nearly so, from different breeders, and broken with a variety of colours: those of the Verports are cherry and rose. 5. *Bizarres:* ground yellow, from different breeders, and broken with a variety of colours. The above barbarous names are partly French and partly Dutch, and used by the Dutch florists. *Breeders* mean of one colour, which when broken produce new varieties.—The properties of a fine variegated late Tulip, according to the best modern florists, are these: The stem should be strong, upright, and tall, about thirty inches high. The flowers should be large, composed of six petals, proceeding a little horizontally at first, and then turning upwards, so as to form an almost perfect cup, with a round bottom, rather wider at the top. The three outer petals should be rather larger than the three inner ones, and broader at the base; all the petals should have the edges perfectly entire; the top of each should be broad and well rounded; the ground colour at the bottom of the cup should be clear white or yellow, and the various rich stripes, which are the principal ornament of a fine flower, should be regular, bold, and distinct on the margin, and terminate in fine broken points, elegantly feathered or pencilled. The centre of each petal should contain one or more bold blotches or stripes, intermixed with small portions of the original colour, abruptly broken into many irregular obtuse points. Some florists are of opinion that the central stripes or blotches do not contribute to the beauty of the Tulip, unless they be confined to a narrow stripe exactly down the centre; and that they should be perfectly free from any remains of the original colour: it is certain that such flowers appear very beautiful and delicate, especially when they have a regular narrow feathering at the edge; but it is unanimously agreed, that the Tulip should abound in rich colouring, distributed in a distinct and regular manner throughout the flower, except in the bottom of the cup, which ought indisputably to be of a clear bright white or yellow, free from stain or tinge, in order to constitute a perfect flower.—Towards the middle of the seventeenth century the Tulip became an object of considerable trade, and the price of the roots rose higher than that of the most precious metals. It was principally carried on in the Netherlands, and was at its height in the years 1634, 5, 6, and 7. For one root of a variety called the Viceroy, articles to the value of 2500 florins were agreed to be delivered. The Semper Augustus has been often sold for 2000 florins; one person agreed to give 4600 florins, with a new carriage, two horses, and a complete harness, and another agreed to give 12 acres, for a single root. The trade was generally followed for a time; but it was a mere gambling business, rightly named *Tulipomania*, or Tulip Madness. The Tulip is a native of the Levant, is common in Syria, and is supposed by some to be the Lily of the fields alluded to by our blessed Saviour. In Persia, where it is abundant, they consider it as the emblem of perfect lovers. When a young man, says Chardin, presents one to his mistress, he gives her to understand, by the general colour of the flower, that he is on fire with her beauty; and by the black base of it, that his heart was burnt to a coal. Chardin saw it on the northern confines of Arabia. Rauwolf found it at Aleppo, and on Mount Libanus; Shaw, between Jaffa and Rama; Bushequius, between Adrianople and Constantinople, every where in abundance, with Narcissus, Hyacinths, &c. in the middle of winter. It grows also in Macedonia, Thrace, and the Crimea. According to Clusius, the early-blowing flowers were brought to Constantinople from Cavala, a town on the eastern coast of Macedonia; and the late-blowing ones from Caffa, a town in the Crimea.—*Propagation and Culture.* The roots of *early-blowing Tulips* should be planted at the beginning of September, in a warm border, near a wall, pale, or hedge; because, if they be put into an open spot of ground, their buds are in danger of suffering by early frosts in the spring. The soil for these should be renewed every year. The best soil for this purpose is that which has been taken from a light sandy pasture, with the turf rotted amongst it, and to this should be added a fourth part of sea-sand. This mixture may be laid about ten inches deep, which will be sufficient for these roots, which need not be planted at a greater depth than four or five inches. The offsets should not be planted amongst the blowing roots, but in a border by themselves, where they may be set pretty close together, especially if they are small; but these should be taken up when their leaves decay, in the same manner as the blowing roots, otherwise they would rot if the season should prove very wet, as they are more tender than the late-blowers, and do not increase half so fast, hence greater care is required to preserve their offsets. When these Tulips come up in the spring, the earth upon the surface of the borders should be gently stirred and cleared of the weeds, and as the buds appear, if the season should be very severe, it will be of great use to cover them with mats, for want of which many times they are blighted, and their flowers decay before they blow, which is often injurious to the roots, as is also the cropping of the flowers soon after they are blown, because their roots, which are formed new every year, are not at that time arrived to their full magnitude, and are thereby deprived of the necessary nourishment. If, when these flowers are blown, the season should prove very warm, it will be proper to shade them with mats in the heat of the day, as well as in the frosty nights, which will preserve their beauty; but when the flow-

ers are decayed, and their seed-vessels begin to swell, they should be broken off just at the top of the stalks, because, if permitted to seed, the roots will be greatly injured. When the leaves are decayed, which will be before the late-blowers are out of flower, their roots should be taken up, and spread upon mats in a shady place to dry; after which they should be cleared from filth, and put in a dry place where vermin cannot come to them, until the season for planting them again; being very careful to preserve every sort separate, in order to know how to dispose of them at the time for planting, because it is the better way to plant all the roots of each sort together, and not to intermix them, as is commonly practised in most other kinds of flowers; for as there are few of them which blow at the same time, so when the several roots of one sort are scattered through a whole border, they make but an indifferent appearance; whereas, when twenty or thirty roots of the same sort are placed together, they will all flower at the same time, and afford a more agreeable spectacle. There are many curious persons, who, in order to preserve their several kinds of Tulips, and other bulbous-rooted flowers, separate, have large flat boxes made, which are divided into several parts by small partitions, each of which is numbered in the same manner as the divisions of the beds; so that when a catalogue of the roots is made, and the numbers fixed to each sort in the beds, there is nothing more to do in taking up the roots, but to put every kind into the division marked with the same number in the bed. This saves a great deal of trouble in making fresh marks every time the roots are taken up, and effectually answers the purpose of preserving the kinds distinct. The *late-blowing Tulips* are generally obtained from breeders, which is a term applied to all such flowers as are produced from seeds, which are of one self-colour, and have good bottoms and chives; these in time break into various beautiful stripes, according to the ground of their former self-colour, but this must be entirely thrown off, otherwise they do not conceive a flower well broken. Of these breeders, there has been a great variety brought into England from Flanders, which is a grand nursery for most sorts of bulbous-rooted flowers; but there are some curious persons who have lately obtained many valuable breeders from seed sown in England; and doubtless were we as industrious to sow the seeds as the Flemings and French, in a few years we should have as great a variety as is to be found in any part of Europe; for although it is six or seven years from the sowing before the flowers blow, yet if after the first sowing there be every year a fresh parcel sown, when the seven years are expired, there will be constantly a succession of roots to flower every year, which will reward the expectation, and keep up the spirit of raising; but it is the length of time at first, which deters most people from this work. The following is the process of propagating these flowers from seeds. Without good seed, little success can be expected. The best is that saved from breeders, which have all the good properties already described. The surest way to obtain good seeds, is to choose a parcel of breeding roots to be set apart for that purpose in a separate bed, fully exposed to the sun: taking care to plant them at least nine inches deep, for if they be planted too shallow, their stems are apt to decay before their seed is perfected. Their flowers should always be exposed to the weather, for if shaded by mats or any other covering, it will prevent their perfecting the seed. A little before or after the middle of July, the seeds will be fit to gather, which may be known by the dryness of their stalks and the opening of the seed-vessels; they may then be cut off, and the seeds preserved in the pods till the season for sowing, placing them in a dry place, otherwise they will be subject to mould, which will render them useless. About the beginning of September, is the best season for sowing. Shallow seed-pans or boxes, with holes in the bottoms to let off the moisture, should be filled with fresh sandy earth, laying the surface very even. Upon this the seed should be sown as regularly as possible, that they may not lie upon each other; then there should be some of the light sandy earth sifted over them, about half an inch thick. Place the boxes or pans where they may receive the morning sun till eleven o'clock until October; and then remove them into a more open situation, where they may enjoy the sun all day and be sheltered from the north winds through the winter. In the spring, when the plants appear with grassy leaves, replace the boxes in their former situation, and in dry seasons water them while the plants remain green; but as soon as their tops begin to decay, no more should be given: the boxes should be placed in a shady situation during the summer season, but not under the drip of trees. These plants at their first appearance have very narrow grassy leaves like those of Onions, and come up with bending heads in the same manner. Hence ignorant persons pull them up instead of grass whilst they are very young, before their leaves are a little more expanded, which rarely takes place in the first year, because they seldom appear before the middle of March, and commonly decay about the latter end of May or the beginning of June, according as the season is hotter or colder. The weeds and moss should be cleared off from the surface of the earth in the boxes, and a little fresh earth sifted over them soon after their leaves decay, which will be of great service to their roots. At Michaelmas let them be fresh-earthed again, and as the winter comes on, they must be again removed into the sun as before, and treated in the same way until their leaves decay in the spring, when the bulbs should be carefully taken up, and planted in beds of fresh sandy earth, which should have tiles laid under them, to prevent their roots from shooting downward, which they often do when there is nothing to stop them, and are thereby destroyed. The earth of these beds should be about five inches thick upon the tiles, which will be sufficient for nourishing these roots while they are young. The distance which these young bulbs should be allowed, need not be more than two inches, nor should they be planted above two inches deep; but toward the end of October it will be proper to cover the beds over with a little fresh earth about an inch deep, which will preserve the roots from the frost, and prevent moss or weeds from growing over them; but if the winter should be very severe, it will be proper to cover the beds either with mats or pease-haulm, to prevent the frost from penetrating the ground, because these roots are much tenderer while young, than they are after they have acquired strength. In the spring, the surface of the ground should be gently stirred to make it clean, before the plants come up; and in dry springs they will require frequent waterings, which should be in small quantities. When the leaves are decayed, the weeds should be taken off, and the beds covered with fresh earth, which ought also to be repeated in autumn. When the bulbs have been managed in this way two years, they should, in the summer following, when their leaves decay, the roots being by that time considerably improved in growth, be again taken up and planted into fresh beds, at four inches asunder, where they may remain two years more, during which time they should have the same culture as before; and after that, the bulbs being large enough to blow, they should be taken up, and planted in fresh beds, at the usual distance, and in the same manner as old roots: where, when the flower, such of them as are worthy

to be preserved, should be marked with sticks; and at the season for taking up the bulbs, they must be separated from the others, in order to be planted as breeders in different beds; but you should by no means throw out the rest until they have flowered two or three years, because it is impossible to judge exactly of their value in less time; for many, which at first flowering appear beautiful, will afterwards degenerate so as to be of little value; and others which did not please at first, will many times improve, so that they should be preserved until their worth can be ascertained. In this method many sorts of new breeders will be annually raised, from which there will always be fine flowers broken, which, being the produce of a person's own sowing, will be greatly valued, because they are not to be any where else obtained; upon which principle alone the price of all exquisite flowers depends.—Thus far we have treated of the method of raising these flowers from seed; what follows relates to the management of those roots termed *breeders*, in order that some of them may every year break out into fine stripes. In this art, however, it must be admitted there is no absolute certainty; all that can be done is to shift the roots every year into fresh earth of different mixtures, and into different situations. The earth of these Tulip-beds should be changed every year, because, though it be generally agreed that lean hungry fresh earth hastens their breaking, and causes their stripes to be the finer and more beautiful, yet, if they be every year planted in the same sort of soil, it will not produce so great an effect upon them as if they were planted every year in a different kind of earth. If some fine-striped Tulips are planted in the same bed with the breeders, intermixing them together, it will cause the breeders to break the sooner. The best compost for these roots is a third part of fresh earth from a good pasture, which should have the sward rotted with it, a third part of sea-sand, and the other part sifted lime-rubbish; these should be all mixed together six or eight months at least before it is used, and should be frequently turned in order to mix the parts well together. With this mixture the beds should be made about two feet deep, after the following manner: after the old earth is taken out of the bed to the depth intended, then some of the fresh earth should be put in about eighteen inches thick; this should be levelled exactly, and then lines drawn each way of the bed, chequerwise, at six inches' distance; upon the centre of each cross, should be placed the Tulip-roots, in an upright position, and after having finished the bed in this manner, the earth must be filled in, so as to raise the bed six or eight inches higher, observing, in doing this, not to displace any of the roots, and also to lay the top of the beds a little rounding, to throw off the water. There are many persons so careless in planting their Tulip-roots, as only to dig and level the beds well, and then with a blunt dibble to make holes, into which they put the roots, and then fill up the holes with a rake: but this is by no means a good method; for the dibble, in making the holes, presses the earth closely on each side, and at the bottom, whereby the moisture is often detained so long about the roots as to rot them, especially if the soil be inclinable to bind; besides, the earth being hard at the bottom of the bulbs, they cannot so easily emit their fibres, which must certainly prejudice them. The beds ought to be sunk more or less below the surface, according to the moisture or dryness of the ground, for the roots must be so elevated as never to have the water standing near the reach of their fibres in winter, for moisture is very injurious: hence where the soil is very wet, it will be proper to lay some lime-rubbish under the earth, in order to drain off the wet, and the beds should be entirely raised above the level of the ground; but to prevent their falling down into the walks after frosts or hard rains, raise the path between them, either with sea-coal ashes or rubbish, eight or ten inches, which will support the earth to the beds; and these paths may slope at each end from the middle, which will make a passage for the water to run off as it falls. But where the soil is dry, the bottom of the beds may be sunk eighteen or twenty inches below the surface, which will be allowance enough for their settling. During the winter season, there will be no farther care required. The roots being planted thus deep, will be in no danger of suffering by ordinary frosts, but in very severe winters rotten tan or pease-haulm may be laid over the beds to keep out the frost, otherwise they are very subject to blight and decay soon after they appear, if the frost pinches their tops; but it it will be necessary to cover them in such nights only when there is a prospect of frost, for at all other times they should have as much air as possible, without which they will draw up weak, and produce small flowers. When the breeding Tulips are in flower, carefully examine them, to see if any of them have broken into beautiful stripes, and mark such by placing a stick in the ground to plant among the striped flowers in the following year. Carefully, however, observe whether they have thrown off their former colour entirely; and when they decay, notice whether they appear beautiful to the last, and not smeared over with the original colour, otherwise they will very probably resume their old colour in the next year. But if their stripes be clean and distinct to the bottom, and continue so to the last, which is what the florists term dyeing well, there is no great danger of their relapsing; for if one of these flowers be quite broken, it will never lose its stripes, though sometimes it will blow much fairer than at others, and the flowers of the offsets will often be more beautiful than those of the old roots. This alteration in the colour of these flowers may be seen long before they are blown, for all the green leaves of the plant will appear of a fainter colour, and seem to be striped with white, or of a brownish colour, which is a plain proof that the juices of the whole plant are altered, or at least the vessels through which the juice is strained; whereby particles of a different figure are capable of passing through them, which, when entered into the petals of the flower, reflect the rays of light in a different manner, which occasions the variety we see in the colours of the flowers. This breaking of the colours proceeds from weakness, or at least is the cause of weakness in plants; for it is observable, that after Tulips are broken into stripes, they never grow so tall as before, nor are the stems, leaves, or flowers, so large as before; and it is the same in all other variegated plants and flowers whatever, which become much tenderer than they were before they were striped; so that many sorts of exotics, which accidentally become variegated in their leaves, are often rendered so tender as not to be preserved without much more care, though the striping of Tulips never occasions so great weakness in them as to render them very tender. The greatest effect it has on them is in lessening their growth, causing some, which while they continued in their original plain colours rose near two or three feet in height, to advance little more than two after their colours were altered; and the more beautiful the stripes appear, the shorter will be their stems, and the weaker their flowers. There is nothing more to be observed in the culture of striped flowers than what has been directed for breeders, excepting that these should be arched over with tall hoops and rails, that they may be shaded from the sun in the day-time, and protected from strong winds, hard rains, and frosty mornings, otherwise

the flowers will continue but a short time in beauty; but, where these instructions are faithfully followed, they may be preserved in flower a full month, which is as long as most other flowers continue. Opulent amateurs are sometimes at the expense of erecting large frames of iron-work, to cover their beds of Tulips, in such a manner that they may walk between two beds under the frame, over which are spread tarpaulins, so as to keep off sun, rain, and frost, whereby they can view the flowers without being at the trouble of taking off or turning the tarpaulins, or being incommoded by the sun or rain, which cannot be avoided where the covering is low; besides, by thus raising the covers, the flowers have a greater share of air, so that they are not drawn so weak, as they are when the covering is low and close to them: but these frames being expensive, can only be made by persons of fortune; however, wooden frames may be contrived at a smaller expense, and, being arched over with hoops, appear as sightly, but are less durable. After the flowers are faded, the heads of all the fine sorts should be broken off to prevent their seeding, which would injure them, by rendering their stripes less perfect; their stems also would decay sooner than they otherwise would do: hence, their roots may be taken up early in June, for they ought not to remain in the ground after their leaves are decayed. In taking the roots out of the ground, be careful not to bruise or cut them, which will cause them to rot; and let it be done, if possible, a day or two after the earth has been loosened by rain. When the roots are taken out of the ground, clear them from their old covers, and all sorts of filth, and spread them upon mats in a shady place to dry; after which they should be put up in a dry place, where vermin cannot get to them, observing to keep every sort separate; but they should not be kept too close from the air, nor suffered to be in heaps together, lest they should grow mouldy, for if any of the roots once take the mould, they commonly rot when they are planted again, if not before. The offsets of these roots, which are not large enough to produce flowers the succeeding year, should be also put by themselves, keeping each sort distinct; they should be planted a month earlier in autumn than the blowing-roots, in particular beds by themselves in the flower-nursery, not exposed to public view. The earth of these beds should be prepared in the same manner as for larger roots, but they ought not to be planted above five inches deep, because they are not strong enough to push through so great a covering of the earth as the old roots; they may be placed much nearer together than those which are to flower, which most of them will be strong enough to do in the first year, after which they may be removed into the flower-garden, and placed in the beds among those of the same kinds.—Maddock says, the most proper time to plant Tulip roots is from the end of October to the tenth of November. The bed should be chosen in an open airy part of the garden. Having marked out the ground according to the intended dimensions of the bed, take out the soil to the depth of twenty inches, fill up the bottom with sound fresh earth, ten inches thick; upon this put a mixture of rotten cow-dung and fresh earth in equal quantities, and two years old, to the thickness of twelve inches; and upon this, lay more of the same kind of earth as that of the bottom, two inches thick at the sides, and three in the middle, to give the bed a small degree of convexity. This operation is to be performed about the 20th of October, a week or two before planting, to allow the bed time to settle, after which it will be about two inches higher than in the alleys. If heavy rain should intervene, it will be proper to cover the bed to keep them off, because they would render it too compact and adhesive for the tender fibres to pass freely through it. On the day of planting, rake the surface of the bed even, still preserving its convexity, and mark the places for the roots seven inches from each other every way, adapting the length of the bed and the number of rows to the quantity of roots. If the bed consist of seven rows, which make the handsomest appearance, it ought to be fifty inches wide, which will allow a space of four inches between the outer rows and the sides of the bed; and there should be an alley or path round it two feet and a half or three feet wide. If the bed contain only five rows, it must be three feet wide, to give the roots the same distances, and such a bed will require only one path in front. Sprinkle a little clean sand where the roots are to be set, place them with great exactness, and add some very sandy earth, so as to envelop each root completely in a small cone; then cover the whole very carefully with strong sound fresh loam, about four inches thick at the middle of the bed, gradually decreasing to three inches at the sides; thus will the convexity be increased in a proper degree, and the roots be covered with soil proportioned to their size and strength. The largest and strongest should occupy the centre rows; the smallest and weakest, the outside. No root, however strong, ought to be planted more than four inches deep from the crown of it; nor should any blooming root, however small, be set less than two inches and a half or three inches deep. The soil, intended to cover the bulbs, should have been frequently turned over, and well exposed to the sun and air, some time before it is used, that it may be perfectly sweet and free from all that acrid quality which most soils are subject to, when taken considerably below the surface. If the bed contain but five rows, with a path in front only, the smallest and lowest growing roots should be planted in front, and so on to the last row, which ought to contain the strongest and largest, and the bed may slope towards the front; in which case the back should be supported with boards or brick-work, to prevent the earth from crumbling down, and leaving the roots bare. When the planting is finished, hoop the bed over, that it may be safely covered with mats or canvass in heavy rains and severe frosts. By the end of February every healthy plant will have risen above ground, except a few very late ones, which may be a week longer before they appear. If any canker be discernible, cut it out carefully on a dry day with a sharp knife. When the surface of the bed appears to be of too close a contexture, it should be carefully stirred up, about two inches deep. By the end of April, some of the plants may be grown so tall as to require the hoops to be raised a little. As soon as any of the earlier ones begin to shew colour, shade them from the sun, which would cause the colours to run and intermix, so as to destroy the beauty of the flowers: some are more liable to this injury than others, and may be spoiled in five minutes. When the greater part of the flowers have begun to open, a frame or awning should be erected over the beds and paths, to keep out the rain, and to admit as much light as possible; hence the cloth covering should be rolled up in the morning early, if the weather be favourable, otherwise the colours of the flowers will be faint and weak. This cloth covering should come down on each side, within about three feet of the ground, to allow a free circulation of air, except in windy weather, and then the windward side must be protected quite to the ground.—Tulips, according to some, never require watering, but only need the admission of moderate rain, in small quantities, before and after the bloom is over; before the bloom, they are particularly necessary, to make it strong. When the awning is erected, the hoops

should be carefully taken away, the sides and ends of the bed neatly boarded up, and the paths lowered two or three inches, to bring the flowers nearer to the eye, and they ought to be defended from injury by a slight frame, two feet high, surrounding the bed; lines of small twine, painted green, should pass from one end of the bed to the other, between the rows of flowers; and to these the stems are to be loosely tied with short pieces of green worsted. The awning may be continued on for three weeks with great advantage. When the petals of many flowers begin to drop off, the awning should be taken down, together with the frame and boards, and the mats and hoops replaced, to throw off excess of rain. As the petals fall, the seed-vessel should be broken off close to the stem; for if this be suffered to remain on the plant, it will weaken the root considerably. The bed may remain in this state about a fortnight longer, by which time the foliage will become of a yellowish-brown, and two or three inches at the top of the stem will wither, dry up, and becomes purplish: this denotes the critical period to take up the roots: if they be taken up sooner, they will be weak and spongy; and if deferred later, their juices will become gross, and at the next blowing the flowers will be what is generally termed foul. When the roots are taken up, they are to be gradually dried, and kept dry. In August or September take off the loose skins, fibres, and such offsets as are easily separated; observing not to leave the roots too bare. The last brown skin, which is intimately connected with the root, should remain on it till the time of planting; it should then be entirely stripped off, and the root left perfectly bare and white; but it should be performed with great care, with a small sharp-pointed penknife, to avoid bruising or wounding the root, especially at the lower end, where the fibres are formed, for that is at this time extremely tender, and will scarcely bear to be touched. The smallest and weakest offsets, particularly such as are not provided with a brown skin, may be replanted as soon as they are taken up, about an inch and half deep, in a fresh sandy loam, in a dry situation, defending the beds from heavy rains by hoops covered with mats; or, they may be buried in dry sand till the autumn, and then planted with the larger roots, only not quite so deep.—Tulips are hardier than most other flowers; the offsets, and more ordinary ones, may be planted in any part of the garden, from two to four inches deep, according to the size of the roots, in a good sound soil, with a little rotten cow-dung placed from seven to twelve Inches below the surface. Hail-storms are very destructive to the foliage of these flowers, when they occur early in the spring; hence, although there be no necessity to cover the beds of inferior plants during a common winter, it still is highly proper to defend them against spring-storms; and to cover them during hot and windy weather, while they are in bloom.

Tulip Tree. See *Liriodendron.*

Turbith Root. See *Convolvulus Turpethum*, and *Seseli.*

Turkey Berry Tree. See *Cordia.*

Turkey Wheat. See *Zea.*

Turnip. See *Brassica.*

Turnera; a genus of the class Pentandria, order Trigynia. —Generic Character. *Calix:* perianth two-leaved, funnel-form, deciduous; tube oblong, erect, cylindric, angular; border erect, five-parted: segments lanceolate, length of the tube. *Corolla:* petals five, obcordate, acuminate, flat, from upright spreading; claws narrow, inserted into the tube of the calix. *Stamina:* filamenta five, awl-shaped, shorter than the corolla, inserted into the tube of the calix; antheræ pointed, erect. *Pistil:* germen conical; styles three, filiform, length of the stamina; stigmas capillaceous, multifid. *Pericarp:* capsule ovate, one-celled, three-valved; receptacles annexed to the valves longitudinally, linear. *Seeds:* numerous, oblong, obtuse. Essential Character. *Calix:* five-cleft, funnel-form, exterior, two-leaved. *Petals:* five, inserted into the calix. *Stigmas:* multifid. *Capsule:* one-celled, three-valved.——The species are,

1. Turnera Ulmifolia; *Elm-leaved Turnera.* Flowers sessile, petiolary; leaves biglandular at the base. Stem shrubby, eight or ten feet high, sending out branches on every side the whole length. The corolla is large, and of a bright yellow. Browne says, that it has a shrubby weakly stalk, seldom rising above four or five feet from the root, with a few serrated ovate leaves, and large yellow flowers, having somewhat of the appearance of the malvaceous tribe at first sight.—Native of the West Indies. There is a variety found in Jamaica, with a smaller corolla, pointed petals, bractes without glands, and the antheræ orange, not yellow. This species is easily propagated by sowing the seeds on a hot-bed early in the spring; and when the plants are come up two inches high, they should be transplanted into small pots, and plunged into a hot-bed of tanners' bark, observing to water and shade them until they have taken root, after which they must be treated as has been directed for the Guavas, and other tender plants, from the same countries. Their seeds will often fall into the pots which are placed near them in the stove, and will grow in abundance. As they are too tender to live in the open air in England, they must be placed in the bark-bed in the stove, and kept warm, and frequently watered in winter: in summer they require plenty of air. When the plants are grown pretty large, they may be treated more hardily by placing them in the dry stove; where, if kept in a moderate degree of heat, they will thrive and flower very well. Those who would save the seeds of these plants, must watch them carefully, because, when they are ripe, they soon scatter if not gathered. The flowers are produced during great part of the year, if kept in a proper degree of warmth, so that there are some of the flowers in beauty for nine or ten months; which renders the plants more valuable, though they seldom continue above three years.

2. Turnera Pumilea. Flowers sessile, petiolary; leaves uniglandular. Root annual, branching, fibrous; stem herbaceous, from three to six inches high, branched, nearly upright, but often decumbent, round, hirsute; branches simple, erect; flowers small, yellow, seldom expanded, solitary, sessile at the base of each upper leaf, on its hairy footstalk. Browne ealled this and the seventh species Pumilca, from their smallness. He describes this as always simple and upright, never rising more than two or three inches high, the flowers always solitary, from the axils of the upper leaves.—Native of Jamaica, on dry sandy fields, flowering towards the end of the year; common about Old Harbour, and the foot of the Liguanea mountains.

3. Turnera Rupestris; *Rock Turnera.* Peduncles axillary, two-bristled; leaves linear, serrate. This is a rigid, slender, branched shrub, three feet high: flowers small, yellow, axillary, solitary.—Native of Guiana.

4. Turnera Sidoides; *Sida-leaved Turnera.* Peduncles axillary, leaves obovate, wedge-shaped, serrate. Stems palmary, simple, hairy; flowers solitary, in the axils, on very short peduncles. It agrees with the seventh species, in having a hairy stem; but that wants the bractes and the nap on the leaves.—Native of Brasil.

5. Turnera Frutescens; *Shrubby Turnera.* Peduncles axillary, two-bristled; leaves lanceolate, acuminate, equally serrate. This is a shrub eight feet high; flowers yellow,

small solitary.—Native of Guiana, in the clefts of the rocks: flowering in December.

6. Turnera Rugosa; *Wrinkled Turnera.* Peduncles axillary, leafless; flowers five-styled; leaves oblong, erose-toothed, wrinkled. This is an annual plant, with a fibrous root; stem branched, two feet high, hirsute with rufescent hairs, which cover the whole plant; flowers small, yellow, on long, slender, hairy stalks.—Native of Cayenne and Guiana, on sandy coasts, flowering nearly all the year.

7. Turnera Cistoides; *Betony-leaved Turnera.* Peduncles axillary, leafless; leaves linear-oblong, serrate at top. Root annual, undivided, long, erect, white, thready; stem subdivided, erect, half a foot high, round, hirsute, with alternate spreading branches; flowers solitary, in the axils, yellow and small. Browne describes it as erect, with very narrow leaves, and the flowers growing single at the axils of the upper leaves.—Native of Surinam.

8. Turnera Racemosa; *Cluster-flowered Turnera.* Racemes terminating, elongated; leaves ovate-toothed; peduncles very long, one-flowered; flowers yellow. Annual.—Supposed to be a native of the West Indies.

9. Turnera Guianensis; *Guiana Turnera.* Raceme terminating, few-flowered, naked; leaves linear, serrate, biglandular at the base. This plant puts forth from the root a somewhat woody stem, two feet high; flowers in terminating spikes, on short peduncles, each biglandular at its rise; corolla yellow. Annual.—Native of Guiana, found in marshy meadows, flowering in April.

Turnsole. See *Croton* and *Heliotropium.*

Turpentine-tree. See *Pistacia Terebinthus.*

Turræa; a genus of the class Decandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, bell-shaped, five-toothed, very small, permanent. *Corolla:* petals five, linear, spreading, long; nectary tube cylindrical, length of the petals, with a ten-cleft mouth. *Stamina:* filamenta ten, within the mouth of the nectary, very short; antheræ subovate. *Pistil:* germen roundish; style filiform, length of the nectary; stigmas thickish, wrinkled. *Pericarp:* capsule roundish, pentacoccous; with the valves opening longitudinally. *Seeds:* two, kidney-shaped. *Observe.* The corollas of Melia, Swietenia, and Trichilia, are very like them. Essential Character. *Calix:* five-toothed. *Petals:* five. *Nectary:* toothed, cylindrical; bearing the antheræ at the mouth, between the teeth. *Capsule:* pentacoccous. *Seeds:* two.——The species are,

1. Turræa Virens. Leaves elliptic-lanceolate, emarginate, very smooth; calices and fruits silky, villose. This is an evergreen tree or shrub, with scattered, divaricated, leafy branches; and a smooth cloven bark, silky, villose on the twigs; flowers lateral, shaped into a very small axillary spike, with a few small leaves interposed.—Found in the East Indies, among heaps of scoriæ on worn-out volcanoes.

2. Turræa Pubescens. Leaves ovate, emarginate, pubescent beneath; calices villose; flowers aggregate. Fruit as yet unknown.—Native of the isle of Hainan.

3. Turræa Maculata. Leaves ovate, acute, smooth; calices ciliate; branches alternate; bark cloven, but very smooth; flowers in lateral bundles, with small acute ciliate bractes interposed.—Native of Madagascar.

4. Turræa Sericea. Leaves ovate, bluntish, tomentose on both sides; calices, peduncles, and petals, villose; branches alternate, with a dusky and slightly pubescent bark; flowers from the lateral buds mostly solitary, very large, red, drooping, bursting forth whilst the leaves are yet tender.—Found in Madagascar.

5. Turræa Lanceolata. Leaves lanceolate, rounded on both sides, smooth; segments of the calix very long, lanceolate; stem frutescent, covered with a gray bark; branches wand-like; petals yellow, with a scarlet base; fruit covered with a rufous nap.—Found in Madagascar.

Turritis; a genus of the class Tetradynamia, order Siliquosa.—Generic Character. *Calix:* perianth four-leaved; leaflets ovate-oblong, from parallel-converging, deciduous. *Corolla:* four-petalled, cruciform; petals ovate, oblong, obtuse, erect, entire; claws erect. *Stamina:* filamenta six, awl-shaped erect, length of the claws, two of them short; antheræ simple. *Pistil:* germen length of the flower, round, somewhat compressed; style none; stigma obtuse. *Pericarp:* silique very long, stiff, four-cornered; angles opposite, alternate, obsolete, and somewhat compressed, two-celled, two-valved; valves scarcely equal to the partition. *Seeds:* very numerous, roundish, emarginate. Essential Character. *Silique:* very long, angular. *Calix:* converging, erect. *Corolla:* erect. If the seeds of these plants be permitted to scatter, or if they be sown on a wall among rock-work, or in a dry border, there will be no hazard of their maintaining their situation.——The species are,

1. Turritis Glabra; *Smooth Tower-Mustard.* Root-leaves toothed, hispid; stem-leaves quite entire, embracing the stem. Root biennial, fusiform; stem simple, erect, wand-like, two or three feet high, round, smooth; flowers numerous, small, in a corymb, which soon becomes a spike; petals pale sulphur-coloured or greenish-white, entire. Dr. Withering wished to have this plant named *Towerwort;* and Mr. Curtis remarks, that it varies so much in size, that the old botanists make two species of it.—Native of most parts of Europe, in pastures, pits, and other waste places; and on banks near hedges, on a dry gravelly soil; flowering from May to July. It is not very common near London; but has been noticed at Charlton, in Kent; between Yarmouth and Norwich; at Spixwort, and in the road to Coltishall; in Thurston church-yard, Suffolk; and in the field adjoining; near Colchester, in Essex; at Stowwood, in Oxfordshire; near Lichfield Castle, Bromwich; between Ashbourne and Okeover, in Derbyshire; in the quarries above Bath; on St. Vincent's rocks, near Bristol; and about Darfield, near Barnsley, in Yorkshire.

2. Turritis Lævigata; *American Smooth Tower-Mustard.* Leaves smooth; root-leaves obovate, serrate; stem-leaves lanceolate-linear, quite entire, embracing. Root biennial; stem quite simple, a foot high; flowers like those of the preceding species, but a little smaller; it is, however, clearly distinct from the preceding, which it otherwise resembles by its smooth, obovate, serrate root-leaves; and its narrower lanceolate-linear stem-leaves.—Native of Pennsylvania.

3. Turritis Stricta; *Slender Tower-Mustard.* Leaves smooth, shining; radical ones ovate, somewhat toothed; stem-leaves lanceolate, sharply toothed, sessile; stem simple, two feet high, erect. It is allied to the next species, from which it differs chiefly in its smoothness.—Native of moist meadows in Piedmont.

4. Turritis Hirsuta; *Hairy Tower-Mustard.* All the leaves hispid; stem rough-haired; hairs simple, spreading; silique quadrangular. Root strong, woody, perennial; stems generally several, one of which is much stronger than the rest, erect, a foot high, leafy, branched, round, clothed with thick-set, simple, white, prominent hairs; the upper part and flowering-branches smooth; flowers small, white. Mr. Woodward remarks, that the plant does not grow so tall, and that the pods are not nearly so numerous, as in the Smooth Tower-wort; the corolla also is white, and the flower appears earlier.—Native of many parts of Europe, on rocks, in stony places, on old walls and castles, and in dry mountainous

pastures; flowering in May. It has been observed near Midhurst, in Sussex; on Switham bottom near Croydon, in Surry; near Bury, in Suffolk; in several parts of Cambridgeshire; at Rewley Abbey, in Oxfordshire; upon the ruins of Old Sarum; upon St. Vincent's rocks, near Bristol; at Wick Cliffs; at Baydales and Darling; about Settle; and in the King's Park, at Edinburgh.

5. Turritis Patula; *Spreading Tower-Mustard.* All the leaves hispid: stem-leaves embracing, toothed at the end; branches spreading; root annual. It differs from the preceding, in being of a smaller stature, having a more flexuose stem, with spreading, instead of upright stiff branches.—Native of Switzerland and Hungary, on open hills.

6. Turritis Pubescens; *Downy Tower-Mustard.* All the leaves hispid: stem-leaves sessile, bluntly toothed at the end; branches spreading. This resembles the fourth species, but the branches are spreading. Desfontaines says, that it is less villose; that the stem-leaves are more deeply toothed; and the pods fewer and pubescent.—Native of Algiers, on the mountains.

7. Turritis Ciliata. Leaves smooth; stem-leaves sessile, toothed at the base; with forked ciliate hairs at the base and tip; stem quite simple and erect.—Native of Switzerland.

8. Turritis Alpina. Root-leaves toothed, hispid; stem-leaves half embracing; flowers white.—Native of Germany, Silesia, and Austria.

9. Turritis Ovata; *American Hairy Tower-Mustard.* Plant pubescent; radical leaves petiolate, ovate, dentated, obtuse; stem-leaves embracing the stem, oblong, serrate, acute.—Grows on rocks, from Pennsylvania to Virginia.

Tussilago; a genus of the class Syngenesia, order Polygamia-Superflua.—Generic Character. *Calix:* common cylindrical; scales lanceolate, linear, from fifteen to twenty, equal, as long as the disk, submembranaceous. *Corolla:* compound, various; corollets in some all hermaphrodite and tubular, or only in the disk; females in some none, in others ligulate: proper of the hermaphrodite funnelform; border four or five-cleft, acute, reflexed, longer than the calix, entire. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindric, tubular. *Pistil:* in the hermaphrodites, germen short; style filiform, longer than the stamens; stigma thickish, in the females, germen short; style filiform, length of the hermaphrodite; stigma bifid, thickish. *Pericarp:* none; calix scarcely changed. *Seeds:* in the hermaphrodites, solitary, oblong, compressed; down capillary, stipulate: in the females, if any, like the others; receptacle naked. *Observe.* The first species has a sessile down; the ninth varies with floscular and radiate flowers; and the fourteenth has no ligulate florets in the ray, though in some there are naked female florets. Essential Character. *Calix:* scales equal, as long as the disk, somewhat membranaceous. *Down:* simple. *Receptacle:* naked.—All the plants of this species are propagated by parting their roots in autumn, and must be planted in a moist shady border, where they will thrive, and require no further care but weeding.——The species are,

1. Tussilago Anandria; *Siberian Colt's-foot.* Scape one-flowered, scaly, erect; leaves lyrate, ovate. The flowers of this very low plant stand upon short footstalks, which rise between the leaves, and are three or four inches long, each sustaining one dirty purple-coloured flower at the top.—Native of Siberia.

2. Tussilago Dentata; *West Indian Colt's-foot.* Scape one-flowered, without any bracte; flower radiated, erect; leaves sessile, oblong, wavy, toothed, villose.—Native of the West Indies.

3. Tussilago Albicans. Scape one-flowered, naked; flower radiated, drooping; leaves lanceolate-ovate, tomentose beneath, indistinctly serrate backwards; root annual, simple.—Native of Jamaica.

4. Tussilago Pumila. Scape one-flowered, without any bracte, erect; leaves lyrate, gashed, toothletted, tomentose; annual.—Native of Jamaica.

5. Tussilago Nutans. Scape one-flowered, without any bracte; flower nodding; leaves lyrate, obtuse. This is an annual, stemless plant; stalks about a foot high; corolla radiate.—Native of Jamaica.

6. Tussilago Alpina; *Alpine Colt's-foot.* Scape almost naked, one-flowered; leaves cordate, orbicular, crenate. The peduncles spring from the root, are four inches long, woody, and sustain one purplish flower at top. It flowers in March, April, and May.—Native of the Alps, Switzerland, Austria, the south of France, Piedmont, and Siberia.

7. Tussilago Farfara; *Common Colt's-foot.* Scape one-flowered, scaly; flower radiated; leaves cordate, angular, toothletted. Root perennial, creeping horizontally far and wide; stalks five or six inches high, erect, simple, downy, clothed with alternate, ovate, erect, purplish scales three-quarters of an inch long; flowers solitary, terminating, yellow, more conspicuous on account of their radiate form than most of the other species: they come up early in the spring, before the leaves, and at some distance from them: they are upright, but as soon as the bloom is past, and the seeds, with their down, as yet moist, are enclosed within the calix, the heads hang down, till the moisture evaporates in ripening, when they become lighter, are again erected, and the down expands. The cotton on the leaves easily rubs off; this, wrapped in a rag dipped in a solution of saltpetre, and dried in the sun, makes the best tinder. The leaves are the basis of the British Herb Tobacco: they are somewhat austere, bitterish, and mucilaginous, and were formerly much used in coughs, and consumptive complaints. Dr. Cullen found them of considerable service in scrofulous cases. He gave a decoction of the dried leaves, and found it succeed where sea-water had failed; and Fuller relates the case of a girl, with twelve scrofulous sores, who was cured by drinking daily as much as she could, for four months, of a decoction of the leaves made so strong as to be sweetish and glutinous. It is remarkable that the smoking of Colt's-foot, for a cough, has the recommendation of Dioscorides, Galen, Pliny, Boyle, and other great men, ancient and modern; and, according to Linneus, the Swedes smoke it for that purpose.—Native of moist chalky situations throughout Europe, flowering in March or April. It is a bad weed on some lands, especially such as have been over-cropped and exhausted. Ploughing and harrowing alone, will not destroy it; it must be drawn out by the roots, which may be effected at a small expense in well-tilled land.

8. Tussilago Japonica. Flowers alternate, radiate; corollets yellow. Root bitter, and esteemed by the Japanese as a counterpoison.—Native of Japan.

9. Tussilago Frigida. Thyrse fastigiate; flowers radiate; root perennial, creeping; corolla white, rayed.—Native of Lapland, Switzerland, Silesia, Dauphiny, and Siberia.

10. Tussilago Palmata; *Palmate-leaved Colt's-foot.* Thyrse fastigiate; leaves palmate-toothed, which sufficiently distinguish it from all the rest. Perennial: flowering in April.—Native of Newfoundland and Labrador.

11. Tussilago Alba; *White Colt's-foot,* or *Butter-bur.* Thyrse fastigiate; female florets naked, few. Root perennial, less superficial than that of the ninth species, and not striking

so deep as the fourteenth; flowers of a beautiful white, on a scape, from four to eighteen or twenty inches in height, disposed in a corymb, from thirty to forty in number.—Native of several parts of Europe.

12. Tussilago Hybrida; *Long-stalked Colt's-foot*, or *Butter-bur*. Thyrse oblong; female florets numerous; hermaphrodite florets very few; antheræ separate. Root perennial, thick, and fleshy, creeping very far; flowers flesh-coloured, without any ray. We are almost persuaded, says Dr. Smith, that this plant is the true female of Petasites, (the fourteenth species) being furnished with a small provision only of the other sex, to perform its office occasionally, as in Spinachia, Cannabis, Musa, &c. It flowers in April; the down of the seeds, forming a silvery plume, is very ornamental and conspicuous.—Native of Germany, Holland, Silesia, Switzerland, Dauphiny, Piedmont, and Great Britain, by the sides of ditches, in several parts of Leicestershire; about Manchester; and near Banbury in Oxfordshire.

13. Tussilago Paradoxa; *Downy-leaved Colt's-foot*, or *Butter-bur*. Thyrse subovate; female florets naked, many; hermaphrodite, in threes; antheræ free; leaves triangular, cordate, toothletted. Root scarcely creeping; flowers nearly upright, about twenty in a thyrse. Dr. Smith observes, that it is worth consideration, whether the Alba (eleventh species) may not stand in the same relation to this, as the twelfth does to the fourteenth: the antheræ in this being separate, as in Hybrida; and united in Alba, as in Petasites. It flowers in April.—Native of Switzerland.

14. Tussilago Petasites; *Common Butter-bur*. Thyrse ovate; almost all the florets hermaphrodite, syngenesious; leaves roundish-cordate, unequally toothed, slightly angular, with rounded converging lobes, paler and somewhat downy beneath. Root perennial, thick and fleshy, creeping very far, and increasing rapidly, so as to be hard to extirpate; in which respect it agrees with the twelfth species, as well as in the appearance and form of its leaves, which, however, are somewhat larger; stalks a span high, thick, downy, clothed with oblong reddish bractes, partly leafy at their extremity; and terminating in a dense ovate panicle of pale dusky flesh-coloured flowers. The younger Linneus, and Haller, have occasionally noted a very few female florets to accompany the others, which, the latter tells us, produces good seeds. This circumstance is rare, and has not been observed in England; nor, if general, would it invalidate the conjecture, that this is the real male of the Hybrida, and forms but one species with that. All these plants increase so much by root, that impregnation rarely takes place, which is also the case with Mints, and many other vegetables. As the florets of the circumference only, in this genus, produce perfect seeds, the central ones having the thickened stigma, which appears always to be barren, Dr. Stokes and Professor Sibthorp would remove it to the order Polygamia Necessaria; but syngenesious plants are so subject to such variations in the perfection of their organs of impregnation, that it is by no means certain, how far that order, or indeed some others, are founded in nature. Its large leaves, often three feet broad, are alluded to in the Greek name *Petasites*: the English name *Butter-bur* arose from the large leaves being used to wrap fresh butter in; and *Pestilentwort*, from its efficacy in epidemic fevers, which is testified in the following words, by Hill: The roots of this plant are an admirable medicine in the worst kind of fevers; and taken early, prevent those bad effects which arise from the use of improper medicines. I remember, says he, that in a fever which raged about twenty years ago, and proved very fatal, it was usual for the physician to ask, at his first visit, if the patient had been blooded; and, if he was answered in the affirmative, told the relations or attendants there was little hope of a recovery. Bleeding indeed was too often productive of fatal consequences; and I fear the medicines commonly given on the first attack were little less so. The disease, which was of the putrid kind, raged at the same time in Germany; and while the inhabitants of Great Britain fell a sacrifice to bleeding and chemical medicines, they recovered and lived, by making use of Butter-bur. The method of using the root is this: After having cut away the fibres from the body of the root, and washed it, slice two ounces of it, thin, into a clean earthen vessel, and pour on it a quart of boiling-hot soft water; let it stand till cold, and then pour it clear off, adding about a quarter of a pint of mountain wine to it, and a little fine sugar, and let a quarter of a pint of this be taken every fourth hour: the spirits will be raised; the anguish and depression which accompanies these kind of fevers, and proclaim their fatality, will be removed; a kind gentle sweat will soon come on; every bad symptom will vanish; and the patient will speedily recover his health. If, in the worst of cases, a boil or bubo should make its appearance under the arms, or in any other part of the body, make an ordinary poultice of white bread and milk, and to a half-pint bason of it add a quarter of a pound of Butter-bur roots, bruised, but not boiled, together with a little salad oil. Apply this on the part; let it be kept warm, and renewed frequently; so will the patient have all the chance for a recovery which the nature of the case admits. I could say much more on this subject, but it would be an unnecessary task to prove that the sun gives light; and it is no less certain that this root is the best known remedy for putrid and pestilential fevers.—It flowers in April; and is found throughout Europe, on the banks of rivers and ditches, &c.

15. Tussilago Sagittata. Thyrse ovate, fastigiate; flowers radiated; radical leaves oblong, acute, sagittate, very entire; lobes obtuse.—Grows at Hudson's bay.

Tutsan. See *Hypericum*.

Twayblade. See *Ophrys*.

Typha; a genus of the class Monœcia, order Triandria.—Generic Character. *Male Flowers* numerous, in an ament, terminating the culm. *Calix:* ament common, cylindrical, very close, composed of three-leaved setaceous proper perianths. *Corolla:* none. *Stamina:* filamenta three, capillary, length of the calix; antheræ oblong, pendulous. *Female Flowers* numerous, in an ament surrounding the same culm, digested very compactly. *Calix:* perianth of many capillary bristles. *Corolla:* none. *Pistil:* germen placed on a bristle, ovate; style awl-shaped; stigma capillary, permanent. *Pericarp:* none; fruits numerous, forming a cylinder. *Seeds:* single, ovate, retaining the style, placed on a bristle; down capillary, from the base to the middle, fastened to the seed-bearing bristle, length of the pistil. Essential Character. *Male:* ament cylindrical. *Calix:* indistinct, three-leaved. *Corolla:* none. *Female:* ament cylindrical, below the males. *Calix:* a villose hair. *Corolla:* none. *Seed:* one, placed on a capillary down.——The species are,

1. Typha Latifolia; *Great Cat's-tail*, or *Reed-mace*. Leaves somewhat sword-shaped; male and female spike approximating. Root perennial, creeping, the thickness of the human thumb, jointed, spongy, furnished with small fibres of a whitish colour: the young shoots, while tender, terminating in a sharp hard point, like Quick-grass; stalk from three to six feet high, simple, upright, leafy, round and smooth, without knots, leafy at the base. The female ament is contiguous to the male; the germen very minute,

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P. 719.

TURNERA ULMIFOLIA ___ *Elm-leaved Turnera.*

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VIOLA TRICOLAR ___
Pansy Violet, or Heart's Ease.

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VACCINUM MYRTILLUS ___ *Bilberry, or Bleaberry.*

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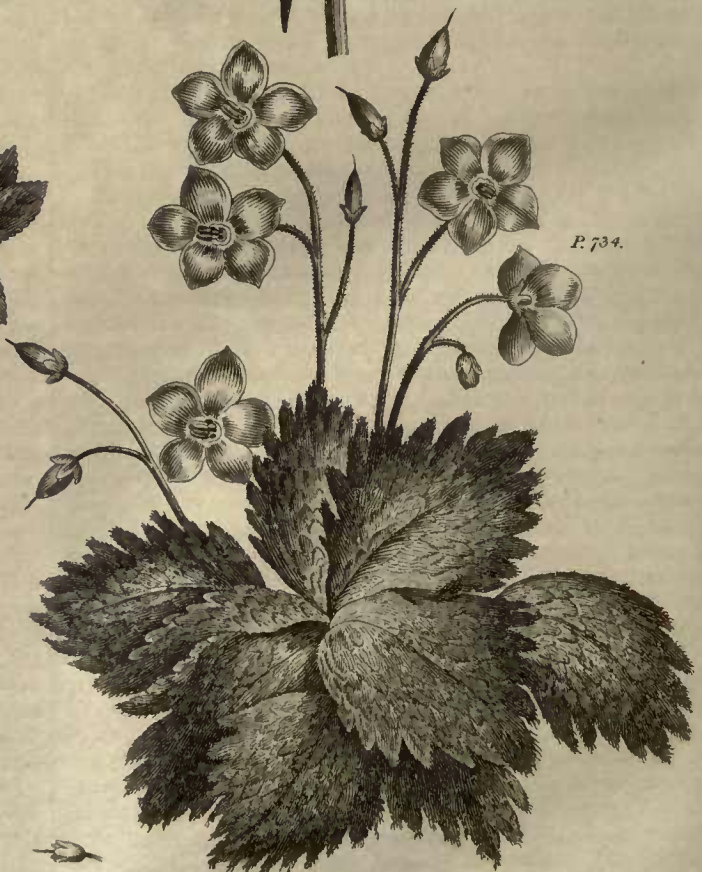

VERBASCUM MYCONI ___ *Borage-leaved Mullein.*

G. Dobie sc.

Published by Thomas Tegg & Co Cheapside London 1828.

sitting on a short footstalk; the style thickened above, and the stigma black; seeds very small, on a downy peduncle, terminated by an awn; receptacle of the male catkin hairy. The quantity of impregnating dust in the male spike is exceedingly great, but proportioned to the great number of seeds in the female spike below: whether these generally vegetate, has not yet been ascertained; we only know that many plants which increase much by the root, seldom produce perfect seed. The part which Linneus describes as the calix, appears rather to consist of some hairs proceeding from the receptacle, and which seem more evidently to be so, from the hairy appearance of the receptacle after the dropping off of the stamina. Curtis observes, it would be much less puzzling, and perhaps more agreeable to the system, to place this plant in the order Polyandria, there being many stamina, and all united to one receptacle.—Haller says, that the roots are eaten in salads, that cattle eat the leaves, and that the downy seeds serve for stuffing pillows. Linneus relates, that coopers used the leaves to fasten the hoops round their casks. Schrœber asserts, that the leaves are suspected to be poisonous. Browne informs us, that in Jamaica the leaves make good mats, and are sometimes used for thatch. The appearance of this species has engaged gentlemen fond of water plants to introduce it on the edges of ponds; and painters frequently represent it in aquatic scenes. Rubens has put it into the hand of Christ as a sceptre, when he was saluted as a king in mockery by Herod's soldiers.—It is a native of four continents; is common in Britain; and has been found in Jamaica, and in New Zealand, in ponds, ditches, and by the sides of rivers and brooks: it flowers here in July.—As the plants of this genus increase so much by their creeping roots, that they soon choke up a small piece of water, and overpower most other aquatics; they are best cultivated for curiosity in a moist border of the garden, where they will flourish, and produce spikes more abundantly than in the water.

2. Typha Angustifolia; *Narrow-leaved Cat's-tail.* Leaves semicylindrical, flattish, equalling the culm; male and female spike remote. This differs from the preceding in having much narrower leaves, not exceeding one-third the breadth of the other, semicylindrical below, flat and strap-shaped toward the end; it has also more slender spikes, though the plant grows as tall and as firm as the Great Cat's-tail, and the male and female spikes about an inch asunder.—There is a variety, called Dwarf Cat's-tail, which Dr. Smith considers as a distinct species. The culm is a foot and half high, but only a third of the size of this species; the spike, however, is three times as thick, abbreviated, foliolose, interrupted, the upper ament either entirely male, as in the others, or female at bottom.—Native of Europe, Barbary, and Siberia; found also in Pennsylvania and Virginia. It has been observed on Woolwich common; in the clay pits of Norfolk and Suffolk; and, along with the variety, on Hounslow Heath.

VACCINIUM; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, small, superior, permanent. *Corolla:* one-petalled, bell-shaped, four-cleft; segments revolute. *Stamina:* filamenta eight, simple, inserted into the receptacle; antheræ two-horned, furnished at the back with two spreading awns, opening at the tip. *Pistil:* germen roundish, inferior; style simple, longer than the stamina; stigma obtuse. *Pericarp:* berry globular, umbilicate, four-celled. *Seeds:* few, small. *Observe.* One-fifth is often added to every part of the fructification. The calix in most of the species is four-cleft, in the first it is quite entire; and almost the whole of the fresh corolla is rolled back to the base in the twenty-seventh species. Essential Character. *Calix:* superior. *Corolla:* one-petalled. *Filamenta:* inserted into the receptacle. *Berry:* four-celled, many-seeded.——The species are,

* *With deciduous Leaves.*

1. Vaccinium Myrtillus; *Bilberry, Bleaberry, Whortleberry,* or *Black Whortles.* Peduncles one-flowered; leaves ovate, serrate, deciduous; stem angular; calix scarcely divided. Root perennial, woody; stem shrubby, erect, scarcely a foot high, very much branched, forming a small tufted bush; branches smooth, green, twisted, sharply angular, especially the young ones; flowers axillary, solitary, on short simple round peduncles, drooping, globular, or nearly so, but a little flatted at the base, flesh-coloured, or rather pale reddish-purple, inodorous; berry the size of a currant, globular, with a dimple at top, five-celled before it ripens, but when arrived at maturity the numerous seeds are imbedded in one continued, soft, acrid, blood-red pulp; though often described as black, they are in reality of a very dark blue. There are as many as thirty seeds in a cell; they are oblong, angular, very finely striated in waves, yellowish, or of a red rust-colour. A variety with white berries was discovered in the woods about midway between Dunkeld and Blair, two seats of the Duke of Athol. About May the young fresh green leaves and wax-like red flowers, make an elegant appearance. Towards autumn the leaves grow darker and more firm; and the ripe berries are gathered in the north for tarts, and in Devonshire are eaten with clotted cream. The berries are very acceptable to children, either eaten by themselves or with milk, or in tarts. The moor-game live upon them in the autumn. The juice stains paper or linen purple. Goats browze upon the plant; sheep are not fond of it; and horses and cows refuse it. The berries have an astringent quality; and in Arran and the Western Isles are given in diarrhœas and dysenteries with good effect. The Highlanders eat them with milk, and make them into tarts and jellies, which last they mix with whisky, to give it a relish to strangers.—Native of Europe, Siberia, and Barbary, on heaths and stony moors, and in woods, where the soil is spongy; flowering in May. It is abundant in the mountainous parts of Great Britain: as, on Porland heath, the highest spot in Norfolk; in Aspley wood, Bedfordshire; on the rocks above Great Malvern, Worcestershire; in Bishop's woods near Eccleshall, and Lightwoods near Birmingham; in the woods of Purbeck, Dorsetshire; near Loughborough in Leicestershire; and abundantly on the woods and heaths of Scotland. This, and the twenty-sixth, increase very fast by their creeping roots, and when fixed in a proper soil will soon overspread the ground.

2. Vaccinium Pallidum; *Pale Bilberry* or *Whortleberry.* Racemes bracted; corolla cylindric, bell-shaped; leaves ovate-acute, serrulate, smooth, deciduous.—It flowers in May and June, and is a native of North America.

3. Vaccinium Hirtum; *Hairy Japan Whortleberry.* Peduncles one flowered; leaves ovate-serrate; branches round, divaricating. Stem shrubby, very much branched; flowers scattered over the branchlets, solitary, drooping, on peduncles half a line in length; corolla five-cleft.—Native of Japan, in

the mountains between Miaco and Jedo. This, like all the shrubby plants of this genus, is difficult of culture in gardens, because they require a moorish or boggy soil, which for some time must be kept covered with wet moss.

4. Vaccinium Stamineum; *Green-wooded Bilberry* or *Whortleberry*. Peduncles solitary, naked, one-flowered; antheræ longer than the corolla; leaves oblong, ovate-acute, quite entire, somewhat glaucous beneath; style longer than the stem. The berries are large, partly pyriform and green when ripe, bitter, and scarcely edible. It flowers in May and June.—Native of North America.

5. Vaccinium Uliginosum; *Great* or *Marsh Bilberry* or *Whortleberry*. Peduncles one-flowered; leaves obovate, quite entire, smooth; branches round. This grows taller than the common sort, and of a more glaucous hue; flowers flesh-coloured, or pink, the calix and corolla mostly four-cleft. They appear in April and May, and the berries ripen in August. The fruit has less flavour than the common Bilberry, abounding with a weak acid juice. In large quantities it occasions giddiness and a slight headache, especially when full grown and quite ripe. Many French vintners are said to use the juice to colour their wines red. They furnish an ardent spirit, which is highly volatile and intoxicating. The Alpine birds feed upon the fruit, which is very common in the lofty regions which they frequent.—Native of many parts of Europe, and of Siberia. Found upon some mountainous marshy heaths in Great Britain, where however it is not general. It has been seen at Gamblesby in Cumberland; in Whinfield forest, Westmoreland; and in the Highlands of Scotland.

6. Vaccinium Album; *White Bilberry* or *Whortleberry*. Peduncles simple; leaves quite entire, ovate, tomentose beneath; flowers two or three at the ends of the branches.—Native of Pennsylvania.

7. Vaccinium Mucronatum; *Pointed-leaved Bilberry* or *Whortleberry*. Peduncles quite simple, one-flowered; leaves ovate, mucronate, smooth, quite entire; branches round, glaucous.—Native of North America.

8. Vaccinium Diffusum; *Shining-leaved Bilberry* or *Whortleberry*. Peduncles solitary, naked, one-flowered; leaves ovate, acute, indistinctly serrate, somewhat villose. It flowers from May to July.—Native of South Carolina.

9. Vaccinium Angustifolium; *Narrow-leaved Bilberry* or *Whortleberry*. Peduncles solitary, one-flowered; leaves elliptic-lanceolate, smooth, indistinctly serrulate. It flowers in April and May.—Native of Newfoundland and Labrador.

10. Vaccinium Corymbosum; *Corymbed Bilberry* or *Whortleberry*. Flowers corymbed, ovate; leaves oblong, acuminate, quite entire. Fruit subacid, and agreeable.—Found in North America.

11. Vaccinium Bracteatum; *Bracted Japan Whortleberry*. Racemes leafy; leaves serrate, acute; stem entirely smooth; branches and branchlets alternate, divaricating; corolla cylindrical, white. It flowers in June.—The Japanese, of whose country it is a native, call it Ki-Fusi.

12. Vaccinium Ciliatum; *Ciliate Japan Whortleberry*. Racemes leafed; leaves ovate, quite entire, hispid; stem ash-coloured, smooth; corolla red.—Native of Japan, where it is called Sasjebu.

13. Vaccinium Fuscatum; *Cluster-flowered Bilberry* or *Whortleberry*. Racemes almost naked; corollas cylindric-ovate; calices acute; leaves elliptic, acute, quite entire; veins somewhat villose beneath. It flowers in May and June.—Native of North America.

14. Vaccinium Frondosum; *Obtuse-leaved Bilberry* or *Whortleberry*. Racemes bracted; pedicels bracteolate; corollas subcampanulate; leaves obovate-oblong, quite entire, deciduous. Berries and under side of the leaves glaucous; fruit large, and but rarely copious, agreeable, but quickly deliquescent, and subject to be infected by the larva of insects. It flowers in June.—Native of North America.

15. Vaccinium Venustum; *Red-twigged Bilberry* or *Whortleberry*. Racemes bracted; pedicels bracteolate; corollas subcampanulate; leaves elliptic, quite entire, deciduous, smooth. It flowers in May and June.—Native of North America.

16. Vaccinium Ligustrinum; *Naked-racemed Bilberry* or *Whortleberry*. Racemes naked; stem shrubby; leaves crenulate, oblong.—Native of Pennsylvania.

17. Vaccinium Resinosum; *Clammy Bilberry* or *Whortleberry*. Racemes bracted; corollas ovate; leaves elliptic, sharpish, quite entire, deciduous, bedewed with resinous atoms.—Native of North America.

18. Vaccinium Amœnum; *Broad-leaved Bilberry* or *Whortleberry*. Racemes bracted; corollas subcylindrical; leaves elliptic, subserrulate, deciduous; veins somewhat villose beneath.—Native of North America.

19. Vaccinium Virgatum; *Rivet-leaved Whortleberry*. Racemes sessile; corollas subcylindrical, leaves oblong-elliptic, serrulate, deciduous, smooth on both sides; flowering-branches elongated.—Native of North America.

20. Vaccinium Tenellum; *Gall-leaved Dwarf Bilberry* or *Whortleberry*. Racemes bracted, sessile; corollas ovate, cylindrical; leaves oblong-elliptic, somewhat wedge-shaped, serrulate, deciduous, smoothish. The fruit is rather small, and too saccharine, but very agreeable, and brought in great quantities to the Philadelphia market. They are sometimes called Sugar Huckleberries.—Native of North America.

21. Vaccinium Arctostaphylos; *Madeira Bilberry* or *Whortleberry*. Flowers racemed; leaves crenulate, ovate, acute; stem arboreous. It flowers in June and July.—Native of Madeira and the Levant.

22. Vaccinium Galezans. Leaves sessile, cuneate-lanceolate, subserrulate, venose, pubescent; fascicles sessile; pedicels very short; calicles acuminate; corolla ovate; style standing out; flowers small, yellowish-white; berries small, globular, black.—Grows in the shady woods and swamps of Virginia and Carolina.

23. Vaccinium Cespitosum. Plant small, cespitose, very glabrous; leaves cuneate-oboval, rotundate-obtuse, conspicuously serrate, membranaceous; flowers branchy, solitary, subsessile; corolla with a short pedicel; berries black.—A little shrub not above three inches high, growing in the more northern regions, particularly about Hudson's Bay.

** *With evergreen Leaves.*

24. Vaccinium Meridionale; *Jamaica Bilberry* or *Whortleberry*. Leaves ovate-oblong, acute, serrate, perennial, flat-lucid; racemes terminating, erect; corollas prismatical, seldom five-cleft; flowers variegated. Berry roundish, juicy, pleasantly flavoured, pale red.—Native of Jamaica.

25. Vaccinium Cereum; *Otaheite Whortleberry*. Peduncles solitary, one-flowered; corollas quinquangular, ovate; leaves ovate-roundish, serrate; corolla bell-shaped.—Native of Otaheite.

26. Vaccinium Vitis Idæa; *Red Bilberry*, *Whortleberry*, or *Cowberry*. Racemes terminating, nodding; leaves obovate, revolute, toothletted, dotted beneath. Roots creeping, woody; stem mostly upright, little branched, twisted or flexuose, angular, smooth, pliant. An elegant drooping cluster of bell-shaped blush-coloured or pale pink flowers terminates the stem or branches. The berries are red, acid, astringent, and bitter. They are scarcely to be eaten-raw; and though made into pies in Derbyshire, where they are

called Cowberries, their flavour is far inferior to the Cranberry. Their best use is for making a rob or jelly, which the Swedes eat with all kinds of roast meat, and is far preferable to that of the red currant as a sauce for venison. It is also an excellent medicine for colds, sore throats, and all irritation of the mouth or fauces. Linnæus observes, that these berries are sent in large quantities from West Bothnia to Stockholm for pickling; but that in Switzerland, and other more southern parts of Europe, they leave them to the birds. —Native of most parts of Europe, particularly the northern countries, on dry stony heaths or moors on the mountains. Many parts of Derbyshire, the north of England, Scotland, and Wales, are clothed with this humble evergreen. It occurs also on rocks near the sea-coast from Canada to New England. It flowers in June.

27. Vaccinium Oxycoccus; *European Cranberry.* Leaves ovate, quite entire, revolute, acute; stems creeping, filiform, smooth. Root perennial, fibrous; branches scattered, procumbent, leafy, flowering about the upper part; flowers drooping, of a beautiful rose or flesh colour, singularly elegant; berry globular, or pear-shaped, pale red mottled with purple, when fully ripe purplish-red. These berries, made into tarts, are much esteemed, though some dislike them on account of their peculiar flavour. They may be kept several years if wiped dry, and then closely corked in dry bottles; or the bottles may be filled with water. They are brought to London from the moorland counties, and even imported from Russia: the Cambridge market is supplied from Lincolnshire. At Longtown in Cumberland twenty or thirty pounds' worth are sold by the poor people each market day for five or six weeks together. The Swedes have no idea of putting them to any other use than to boil silver plate to its proper whiteness, the sharp acid of the Cranberry corroding the external particles of the copper alloy. It has many names in English: Cranberries, Mossberries, Moorberries, Fenberries, Marshworts, or Whortleberries. The most general name, Cranberry, probably originated from the peduncles being crooked at the top, and, before the expansion of the flower, resembling the head and neck of a crane.—Native of the north of Europe, generally found entangled in Sphagnum and other bog-mosses, which cover the surface of shallow waters, through which those who gather the fruit are obliged to wade. The flowers appear in June, and the berries ripen in August. They abound in the north of England, in Scotland, and in the bogs of Ireland.—Found on Dersingham moor near Norwich; on Bootham moor near Lincoln, and in great quantities in many parts of the county; on Gamlingay bogs, Cambridgeshire; Potton's bogs, Bedfordshire; in Bishop's woods near Eccleshall, Staffordshire; on Birmingham heath, &c.—This and the American Cranberries, being natives of bogs, cannot be propagated upon dry land; but on natural or artificial bogs they will spread and increase, if taken up carefully with some of the soil to their roots, and transplanted in autumn.

28. Vaccinium Hispidulum; *Hairy-stemmed American Cranberry.* Leaves quite entire, revolute, ovate; stems creeping, filiform, hispid. This has the same structure as the European Cranberry, but is larger in all its parts, and the stem is imbricate with bristle-shaped scales. It is extremely abundant in North America, where the Canadian French call it Atopa, a name they have borrowed from the Indians. At Philadelphia, late in autumn, they are brought to market every Saturday; and are boiled and prepared in the same manner as the Swedes treat their Red Whortleberries. They are also made use of during the winter and part of the summer, in tarts and other kinds of pastry. But as they are very sour, they require a great quantity of sugar, in which vast quantities of them are preserved, and sent to the West Indies and to Europe.—The American Cranberry may be cultivated here in an artificial bog with great plenty of water. A few square yards of ground thus employed will yield as much fruit as any family can use. They should be allowed to hang till fully ripe, which will be in October, and will then prove better than the preceding species.

29. Vaccinium Macrocarpon; *Smooth-stemmed American Cranberry.* Leaves quite entire, oval, oblong, obtuse, flat; stems creeping, filiform.—Native of North America.

30. Vaccinium Myrtifolium. Plant creeping, very glabrous; leaves petiolate, oval, lucid, revolute, thinly denticulate; fascicles axillary, subsessile, with few flowers; corollas subglobose-campanulate; berries small, black.—Grows in Carolina.

31. Vaccinium Crassifolium. Plant diffuse; branches ascending, lax; leaves oblong-lanceolate, acute, serrate, rigid, glabrous; racemes terminal, corymbed, bracteated, with few flowers; flowers nodding; corollas patulo-campanulate, deeply and acutely five-toothed; flowers pink-red, very ornamental.—Grows in Carolina.

32. Vaccinium Nitidum. Plant erect, very branchy; branches distichous; leaves shining, obovate-elliptic, acute, glabrous, serrate; racemes terminal, corymbed, bracteated, nodding; corollas cylindrical; flowers pink-red. The stem is of humble growth; the young branches downy on two opposite sides.—Grows in Carolina.

33. Vaccinium Myrsinitis. Plant erect, very branchy, with small leaves; leaves sessile, oval, mucronate, subserrulate; fascicles gemmaceous, terminal, and lateral; corollas oblong-ovate, purple; calix scarlet.—A beautiful little shrub, growing in the dry sandy woods of Carolina and Florida.

34. Vaccinium Buxifolium. Plant dwarfish; leaves obovate, crenate, dentated, glabrous; fascicles heaped together, subsessile, axillary, and terminal; corollas short-ovate; filamenta glandulose; stigma capitated; flowers white, delicately tinged with red.—A handsome little shrub, in dry woods, on limestone rocks, in the western parts of Virginia, near Winchester and the Sweet Springs.

35. Vaccinium Ovatum. Leaves petiolate, ovate, acute, revolute, serrate, glabrous, coriaceous; racemes axillary and terminal, bracteate, short; corollas cylindraceous; calices acute.—Grows on the north-west coast of North America.

36. Vaccinium Obtusum. Plant creeping; leaves small, oval, rotundate-obtuse, mucronate, very entire, glabrous, coriaceous; peduncles axillary, solitary, one-flowered.—Grows on the north-west coast of North America.

Vahlia; a genus of the class Pentandria, order Digynia.—Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled, alternate with the stamens. *Capsule:* inferior, one-celled, two-valved, crowned with the permanent calix. *Seeds:* numerous.——The only known species is,

1. Vahlia Capensis. Leaves opposite, sessile, subpubescent, narrow, lanceolate; stipules none; stem herbaceous, round, without knots, below brachiate and subpubescent; flowers from the upper branches, peduncled, two or more, frequently three together, yellow.—Native of the Cape, in sandy places.

Valantia; a genus of the class Polygamia, order Monœcia, (or Tetrandria, Monogynia.)—Generic Character. *Hermaphrodite Flower:* solitary. *Calix:* scarcely any, in place of the germen. *Corolla:* one-petalled, flat, four-parted; segments ovate, acute. *Stamina:* filamenta four, length of the corolla; antheræ small. *Pistil:* germen large, inferior; style length of the stamina, semibifid; stigmas headed. *Peri-*

carp: coriaceous, compressed, reflexed. *Seed:* single, globular. *Male Flower:* one on each side of the hermaphrodite. *Calix:* scarcely any, in place of it the germen. *Corolla:* one-petalled, flat, three-parted, or four-parted; segments ovate, acute. *Stamina:* filamenta four or three, length of the corolla; antheræ small. *Pistil:* germen small, inferior; style and stigmas obsolete, and scarcely to be observed. *Pericarp:* abortive, but a slender oblong rudiment adheres to the side of the hermaphrodite. *Seed:* none. *Observe.* The male flowers are trifid in the first and fifth species; quadrifid in the sixth and seventh. ESSENTIAL CHARACTER. *Hermaphrodite. Calix:* none. *Corolla:* four-parted. *Stamina:* four. *Style:* bifid. *Seed:* one. *Male. Calix:* none. *Corolla:* three or four parted. *Stamina:* four or three. *Pistil:* obsolete.——The species are,

1. Valantia Muralis; *Wall Crosswort.* Male flowers trifid, placed upon the smooth germen of the hermaphrodite; root annual; stem and leaves smooth.—Native of Italy, on the whole coast of Tuscany, especially in dry rocky places; also on old walls at a distance from the coast, as in the Farnese garden, and Dioclesian's baths at Rome. It is found on the sandy shores of the County of Nice; and in the south of France, about Nemours, Magnol, and Montpellier.

2. Valantia Hispida; *Bristly Crosswort.* Male flowers trifid, placed upon the hispid germen of the hermaphrodite; root annual; stems hispid; leaves rugged.—Native of the south of France, and of Barbary, near Algiers.

3. Valantia Filiformis; *Least Crosswort.* Capsules longer than the pedicel, cylindrical, hairy, unarmed; leaves lanceolate, smooth, subciliate. Annual.—Native of the Canary islands: it flowers in July.

4. Valantia Cucullaria; *Hooded Crosswort.* Each of the fructifications covered with an ovate bracte, which is bent down. It flowers in May and June.—Native of Turkey in Asia.

5. Valantia Aparine; *Smooth-seeded Crosswort.* Male flowers trifid, pedicelled, placed on the peduncle of the hermaphrodite; stems branched, procumbent, angular: angles toothletted, rough; leaves mostly in sixes, linear, toothed at the edges, blunt, with a point; corolla white.—Native of Germany, France, Sicily, and Barbary.

6. Valantia Articulata; *Jointed Crosswort.* Male flowers quadrifid; peduncles dichotomous, leafless; leaves cordate; root annual.—Native of Egypt, Syria, and Barbary.

7. Valantia Glabra; *Smooth Crosswort.* Male flowers quadrifid; peduncles dichotomous, leafless; leaves oval, ciliate.—Native of the south of Europe. It flowers in July.

8. Valantia Hypocarpia. All the flowers quadrifid below the germen; peduncles naked, one-flowered; stem herbaceous, from one to three feet high, loose, branched, grooved, rugged; branches opposite, numerous, divaricating, subdivided, patulous, loose, hirsute; flowers peduncled, axillary, small, yellow; berries two, connate, fulvous, small, one-seeded. Browne and Pursh make this plant a species of Rubia.—Native of Jamaica, in the cool mountains.

Valentinia; a genus of the class Octandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, spreading, concave, coloured, five-parted; segments obtuse, concave, entire. *Corolla:* none, unless the calix be taken for it. *Stamina:* filamenta eight, awl-shaped, erect, a little shorter than the calix; antheræ roundish. *Pistil:* germen roundish, superior; style length of the stamina, round, thick; stigma headed. *Pericarp:* capsule berried, roundish, opening into three or four parts, which afterwards roll back, one-celled, pulpy within. *Seeds:* four, oblong. ESSENTIAL CHARACTER. *Calix:* five-parted, coloured, spreading. *Corolla:* none. *Capsule:* berried, four-seeded, pulpy.——The only known species is,

1. Valentinia Ilicifolia. A shrub, two or three feet high, branched, of a rigid habit, without thorns, the branches smooth. Leaves alternate, ovate-lanceolate, three inches long, waved and spiny at the edge, smooth, and very stiff; flowers scarlet-coloured, terminating in a sort of umbel; fruit at first white, afterwards scarlet.—Native of Hispaniola, on the most barren rocks towards the ocean; and in the island of Cuba, about the Havanna, flowering in January.

Valeriana; a genus of the class Triandria, order Monogynia.—GENERIC CHARACTER. *Calix:* scarcely any; a superior margin. *Corolla:* one-petalled, irregular; tube nectariferous, on the lower side gibbous; border five-cleft; segments obtuse. *Stamina:* three, or fewer, (in one species, four;) filamenta awl-shaped, erect, length of the corolla; antheræ roundish. *Pistil:* germen inferior; style filiform, length of the stamina; stigma thickish. *Pericarp:* a crust not opening, deciduous, crowned. *Seeds:* solitary, oblong. *Observe.* A wonderful diversity of the parts of fructification is found in this genus, as to their number and form in different species. The margin of the calix is scarcely observable in some, but is five-cleft in others. The tube of the corolla in some is oblong; in the two first it is furnished with a melliferous spur; in others it is very short. The border in some is equal, in others two-lipped, with the upper lip bifid. Stamina in most three; in some two or one only; in the Siberian species four; in others the sexes are distinct. Stigma in some trifid; in others emarginate; in others globular. Pericarp in some scarcely any; in others a thick capsule; in others two-celled. Seed in some crowned with down, in others without any, and of various forms. ESSENTIAL CHARACTER. *Calix:* none. *Corolla:* one-petalled, gibbous on one side of the base, superior. *Seed:* one.—This genus consists of herbaceous plants, perennial or annual, with an upright round stem, and opposite leaves; the flowers are terminal, numerous, opposite, corymbose, or panicled.——The species are,

** Valerians with a single downy Seed.*

1. Valeriana Rubra; *Common* or *Broad-leaved Red Valerian.* Flowers one-stamined, tailed; leaves lanceolate, quite entire. Roots perennial, woody, as thick as a man's finger, spreading very wide; stems about two feet high, round, smoothish, grayish, hollow. The upper part sends out branches by pairs, which, with the principal stem, are terminated by red flowers growing in corymbs. The whole herb is very smooth and even. The colour of the flowers is usually a deep rose, but varies to full flesh-colour and white.—Native of France, Italy, Switzerland, the Levant, and Barbary. It is frequent in Devonshire and Cornwall, both among rubbish and upon walls; and has been also seen growing on Ely minster, and the walls adjoining. It flowers all the summer and autumn after May.—*Propagation and Culture.* Part the roots of this and the next species, in autumn, or sow the seeds, soon after they are ripe, in a shady border; where they will sometimes come up in the same autumn, especially if the season prove moist, otherwise they will not appear till the following spring. When the plants are fit to remove, transplant them into beds, at about nine inches or a foot asunder: water and keep them clean, and transplant them in autumn where they are to remain. They are too large for small gardens. When the seeds light upon the joints of old walls or buildings, the plants will thrive as well as in the ground, and will continue much longer: the seeds therefore may be scattered on grottos and rock-work, where the plants will flower from May till the frost stops them, and till that time make a good appearance.

2. Valeriana Angustifolia; *Narrow-leaved Red Valerian.* Flowers one stamined, tailed; leaves linear, quite entire. Root smaller than that of the preceding species; stems two feet high or more, branching on each side from the root to within six inches of the top. It appears to be distinguished from the common sort by its leaves, which are all uniformly narrow and more obtuse at the extremity.—Native of the mountains of France, Switzerland, Italy, and Barbary.

3. Valeriana Calcitrapa; *Cut-leaved Valerian.* Flowers one-stamined; leaves pinnatifid. The stalks of this species in good ground will rise nearly a foot and half high, but only half that height upon dry stony soils, and only three inches when they grow out of the joints of old walls. Corolla small, pale rose colour.—Native of the south of France, Italy, Portugal, the Levant, and Barbary. It propagates itself by its downy seeds.

4. Valeriana Dioica; *Small Marsh Valerian.* Flowers three-stamined, diœcious; radical leaves ovate; stem-leaves pinnate. Root perennial, jointed, creeping, the thickness of a crow-quill, white, but sometimes tinged with red; stems from a span to a foot or a foot and half in height, upright, grooved, smooth; flowers blush-coloured, in dense, forked, cymose panicles. This species in England seldom fails to be diœcious: or if there be any hermaphrodite flowers, they are such in structure only, both organs not being perfect. The roots have the same smell with the Officinal and Garden Valerian, and have like properties with them, but in a much weaker degree than the former.—It flowers in May and June, and is a native of Europe and the Levant, in wet meadows, marshes, and by the side of ditches and streams.

5. Valeriana Capensis; *Cape Valerian.* Flowers three-stamined; leaves pinnate; leaflets ovate, toothed; stem hairy at the joints.—Native of the Cape.

6. Valeriana Officinalis; *Officinal* or *Great Wild Valerian.* Flowers three-stamined; all the leaves pinnate; leaflets lanceolate, serrate, nearly uniform. Root perennial, composed of long tender fleshy fibres, uniting in heads, and sending out from its crown one or more long extended creeping shoots; stems in dry ground from one foot to two feet in height, but in woods and hedges, moist ground and gardens, four or five feet high, upright, round, grooved, hollow, in some parts more or less hairy; terminating in flowering-branches, which are brachiate or disposed crosswise; flowers numerous, flesh-coloured or white, in large corymbose tufts. The root has a strong, and to most people a disagreeable smell; its taste is warm, bitterish, and subacrid, communicating its properties to wine, water, and spirit; but it is best in substance, and may be taken from half a drachm to two drachms for a dose. There is no doubt of its possessing antispasmodic virtues in an eminent degree. It is often prescribed with advantage in hysterical cases, and instances are not wanting where it appears to have removed some obstinate epilepsies. In habitual costiveness it is an excellent medicine, and frequently opens the bowels when other stronger purgatives have been tried in vain. The unpleasant flavour of Valerian is best concealed by a small addition of mace. A tincture of the root in proof spirit, and in volatile spirit, are sometimes ordered; and Dr. Cullen says, that if it have sometimes failed, it is from the disease depending upon different causes, or the roots being frequently employed in an improper condition, or in too small doses. Very great effects have been produced by it in hysterical cases; but the root used was procured from dry calcareous pastures, and was given in considerable quantities during a long time. It is well known that cats are very fond of the roots; rats are also equally partial to it, and hence rat-catchers employ them to draw these vermin together.—Native of Europe and Siberia, in woods, hedges, marshes, and near rivers: it also grows among bushes in high pastures and on dry heaths, and is then much smaller and more hairy, with the leaves narrower, the roots highly aromatic, and less nauseous, and more valuable than those produced in gardens. It flowers in June.—*Propagation and Culture.* Part the roots in spring or autumn, and plant them upon a dry fresh undunged soil, in which, though the roots will not make near so great progress as in a rich moist soil, yet for use they will be much preferable. The roots should be taken up when the leaves decay in autumn, and preserved dry until used.

7. Valeriana Phu; *Garden Valerian.* Flowers three-stamined; stem-leaves pinnate; root-leaves undivided. Root thick, fleshy, jointed, spreading near the surface in a very irregular manner, crossing each other, and matting together by their small fibres. This differs from the preceding species in not having the stem grooved, and the outer leaflets being larger than the others. The odour of the flowers is very pleasant, though that of the common sort is very disagreeable, they are copious, and of a pale purplish blush-colour. Their roots, however, have the same smell, taste, and qualities; only this is inferior for medicine. Cats are also extremely fond of it.—Native of Alsace, Silesia, Dauphiny, and Barbary, near La Calle. This should be cultivated in the same way as the sixth species. The plants must be set about two feet asunder in the beds, as they spread and multiply very fast. In dry seasons water them till they have taken root.

8. Valeriana Tripteris; *Three-leaved Valerian.* Flowers three-stamined; leaves toothed; root-leaves cordate; stem-leaves ternate, ovate-oblong.—Grows on the alps of Austria and Switzerland. This and the four following species are difficult to preserve in gardens; as naturally growing on rocks covered with Moss, where the snow continues six or seven months: they therefore require a cold situation and a stony soil.

9. Valeriana Montana; *Mountain Valerian.* Flowers three-stamined; leaves ovate-oblong, somewhat toothed; stem simple. This in stature and habit agrees with the preceding species, but is more tufted, and has the root commonly creeping horizontally, more divided, and not smelling so strongly. Flowers small, pale flesh-coloured.—Native of the mountains of Switzerland, Austria, Carniola, Dauphiny, Piedmont, Silesia, and Siberia, flowering there all the summer.

10. Valeriana Celtica; *Celtic Valerian.* Flowers three-stamined; leaves ovate-oblong, obtuse, quite entire. Root perennial, black, oblique, with long fibres, smelling very strong, aromatic, caulescent at top, and scaly with the remains of the deciduous leaves; stem slender, simple, terminated by a few small whitish flowers in a corymb. It is a very humble plant, the stalks trailing upon the ground among the moss, and putting out roots at their joints, which swell into knobs or tubers.—Native of the alps of Switzerland, Austria, and Carniola.

11. Valeriana Tuberosa; *Tuberous-rooted Valerian.* Flowers three-stamined; root-leaves lanceolate, quite entire, the rest pinnatifid. Roots perennial and tuberous, by which it is easily distinguished. There is a variety which has them longer; the plant is larger, and the leaves more cut, and of a cinereous green: the other is greener, smaller, less cut, and the roots in the form of an olive. It flowers in May and June.—Native of the south of Europe.

12. Valeriana Saxatilis; *Rock Valerian.* Flowers three-stamined; leaves somewhat toothed; root-leaves ovate; stem-leaves linear-lanceolate. Root perennial, blackish, with numerous and long fibres, covered with the remains of leaves; having the smell and taste of the sixth species, but much

more unpleasant and acrid, and leaving a bitterness on the tongue. The whole plant is shining, and about half a foot high; seed downy.—Native of the mountains of Stiria, Austria, Silesia, Dauphiny, and Piedmont.

13. Valeriana Elongata; *Long-clustered Valerian.* Flowers three-stamined; root-leaves ovate; stem-leaves cordate, sessile, gashed, and somewhat hastate. Root perennial, with fewer fibrils, dirty white, having little taste or smell. It is a shining upright plant, with a simple stem half a foot or a span in height; corolla small, dusky, regularly five-cleft. Scopoli observes, that it differs from the ninth species by its radical stem, panicled stalk, and leaves under the first racemes mostly trifid; from the eighth species, by its leaves toothed all round, the stem-leaves ovate, the root-leaves always longer than the petiole.—Native of the mountains of Lower Austria, flowering in July.

14. Valeriana Pyrenaica; *Pyrenean Valerian.* Flowers three-stamined; stem-leaves cordate, toothed, petioled, uppermost ternate. Root perennial, fibrous, from which come out many heart-shaped leaves, on petioles more than a foot in length. The stalks rise three feet high, are hollow, channelled, and send out opposite branches towards the top.—Native of the Pyrenees. It flowers in June, and ripens seed in August. Sow the seeds on a shady border soon after they are ripe, and when the plants come up, treat them as directed for the first species. It delights in shade, and a moist soil.

15. Valeriana Scandens; *Climbing Valerian.* Flowers three-stamined; leaves ternate; stem scandent; seed-crown feathered.—Native of Spain.

16. Valeriana Mixta. Flowers three-stamined; stem quadrifid; lower leaves bipinnatifid; seed-crown feathered.—Found about Montpellier.

17. Valeriana Supina. Flowers four-stamined; involucrets six-leaved, three-flowered; leaves entire. Root perennial; plant small, scarcely bigger than a Daisy, even when cultivated.—Found in Italy and Carinthia.

18. Valeriana Pauciflora. Radical leaves winged; stem-leaves ternate; leaflets oval, acute, serrate; panicles lax, with few flowers; flowers white.—Grows in shady woods on the Allegany mountains, and flowers in June and July.

*** With a three-celled crowned Fruit.*

19. Valeriana Villosa; *Hairy Valerian.* Flowers four-stamined, equal; lower leaves eared, upper toothed, villose; root fibrous. The whole stem, leaves, and panicle, are densely hirsute; corolla subrotate, yellow. It differs from Sibirica by its eared leaves, and the hairiness of the whole plant.—Native of Japan, in Jedo, Nagasaki, &c. flowering in September.

20. Valeriana Polystachia; *Many-spiked Valerian.* Flowers three-stamined; leaves pinnate; spike compound, whorled. Root perennial; stem ascending, roundish, striated, smooth; corolla white, scarcely gibbous at the base, with an equal border shorter than the tube.—Found in watery places near Buenos Ayres.

21. Valeriana Sibirica; *Siberian Valerian.* Flowers four-stamined, equal; leaves pinnatifid; seeds fastened to an oval chaff.—Native of Siberia.

22. Valeriana Ruthenica; *Russian Valerian.* Flowers four-stamined; leaves ovate, fleshy, pinnatifid, toothed; seeds fastened to an oval chaff. Root perennial; stems a foot high, the upper part has two pairs of branches, which, with the principal stem, are terminated at top by the bright yellow flowers; leaves pinnatifid.—Native of Siberia. Sow the seeds of this, and the next species, where the plants are to remain, either in autumn soon after they are ripe, or in the spring. When they appear, thin them where they are too close, and keep them free from weeds.

23. Valeriana Carnosa; *Fleshy Valerian.* Flowers three-stamined; leaves toothed, fleshy, glaucous. Root perennial, tufted; stems a foot high, upright, round, smooth; corolla purple.—Found in the straits of Magellan.

24. Valeriana Cornucopia; *Purple Valerian.* Flowers two-stamined, ringent; leaves ovate, sessile. Root annual; stems pretty thick, channelled, of a purplish colour, eight or nine inches high. From each side of the stem spring slender branches, but the upper part divides into two spreading branches like the others; the joints are swelling, and these branches divide again by pairs, and are terminated by clusters of red flowers. When the flowers are past, the fruit stretches out in the shape of a Cornucopia. It flowers here from May to August.—Native of Spain, Italy, Sicily, Armenia, and Barbary. This, with the following, and the twenty-seventh species, may be propagated by sowing their seeds in autumn, where they are intended to remain. When they come up, thin them, and keep them clean. The plants which rise in autumn will live through the winter, and come early to flower in the following summer, so as to produce good seeds; whereas those which rise in the spring do not ripen their seeds, except the season prove warm.

25. Valeriana Echinata. Flowers three-stamined, regular; leaves toothed; fruit linear, three-toothed, outmost larger, recurved. Root annual; stem dichotomous.—Native of Italy, the south of France, and Barbary.

26. Valeriana Olitoria; *Common Corn Salad,* or *Lamb's Lettuce.* Flowers three-stamined; stem dichotomous; leaves lanceolate-linear, tongue-shaped, obtuse, entire, or the upper ones toothed. There is one seed to each flower; the colour of the flowers is a pale blue. Early in the spring, and even during the winter, this little plant will furnish a tolerable material for salads. Dr. Withering observes, that the tender leaves are little inferior to young Lettuce; but having a strong taste, which is not agreeable to many palates, it is not so much in use as it was formerly. Gerarde, who says it may be called, from the Dutch, White Potherb, informs us that in his time it was used as a salad herb. The French call it *Salad de Pretre,* from its being generally eaten in Lent. As it is common in corn-fields, and appears about the time when lambs are dropped, it has obtained in English the names of Corn Salad and Lamb's Lettuce. There is a smaller variety with jagged leaves.—In order to cultivate this as a salad herb, sow the seeds in autumn on the spot where they are to remain. If sown at the end of August, the first rains will bring up the plants, which should be hoed, to thin them where too close, and to destroy the weeds. Early in the spring, the plants will be fit for use; and the younger they are when used, the better tasted. The seeds will lie in the ground many years, if they happen to be buried deep, and, if turned up to the air, will come up as thick as if they had been newly sown.

27. Valeriana Dentata; *Tooth-seeded Corn Salad.* Flowers three-stamined; stem dichotomous; leaves linear, tongue-shaped, quite entire, or somewhat toothed; fruit ovate, acuminate, three-toothed, two of the teeth very short. This differs from the preceding in having the stem higher, and more divaricating.—Found among corn in England, France, Germany, and Italy.

28. Valeriana Vesicaria; *Bladder-fruited Corn Salad.* Flowers three-stamined; stem dichotomous; leaves lanceolate, toothed; fruit inflated, globular.—Native of Crete or Candia, and of Barbary.

29. Valeriana Coronata; *Crowned Corn Salad.* Flowers

three-stamined; stem dichotomous; leaves lanceolate, toothed; fruit six-toothed; seed ovate, acuminate, small.—Native of the south of France, Italy, Portugal, and Barbary.

30. Valeriana Radiata. Flowers three-stamined; stem dichotomous; leaves oblong, obtuse; heads involucred; root-leaves succulent, narrow, little gashed, spreading on the ground.—Native of Portugal, on the borders of fields.

31. Valeriana Pumila; *Dwarf Corn Salad.* Flowers three-stamined; stem dichotomous; lower leaves toothed, upper linear, multifid. This small plant is scarcely three inches high.—Found in the south of France, about Montpellier.

Valerian, Greek. See *Polemonium.*

Vallisneria; a genus of the class Dicœcia, order Diandria.—Generic Character. *Male. Calix:* common spathe two-parted; segments oblong, bifid, reflexed; common spadix compressed, covered all over with flowers, digested into a spike. *Corolla:* one-petalled, three-parted; tube none; segments obovate, spreading very much, and bent back. *Stamina:* filamenta two, upright, length of the corolla; antheræ simple. *Female,* on a different plant. *Calix:* spathe one-flowered, cylindrical, long, with the mouth bifid, erect; perianth three-parted, spreading, superior; segments equal, ovate. *Corolla:* one-petalled, in three deep, linear, abrupt segments, shorter than the calix. *Pistil:* germen cylindrical, inferior, long; style scarcely any; stigma three-parted; segments semibifid, oval, convex, longer than the calix, spreading, pubescent above. *Pericarp:* capsule cylindrical, long, one-celled. *Seeds:* numerous, ovate, fastened to the side of the capsule. Essential Character. *Male. Spathe:* two-parted; spadix covered with flowers. *Corolla:* three-parted. *Female. Spathe:* bifid, one-flowered. *Perianth:* three-parted, superior. *Corolla:* in three deep linear segments. *Stigma:* three-parted. *Capsule:* one-celled, many-seeded.——The species are,

1. Vallisneria Spiralis; *Two-stamned Vallisneria.* Flowers two-stamined. This is an aquatic plant, with long thin almost transparent leaves, with parallel nerves and plates dividing it transversely, very finely serrate at the end, and floating on the water. The male flower is very small and white, and is borne on a very short scape at the bottom of the water: when mature it breaks loose, and floats on the surface. The female flower, which is larger, and purple, grows upon a spiral scape; it contracts or unfolds according to the depth of the water, so that the flower when it opens is always at the surface; and when flowering-time is past, the scape contracts, and the fructification is completed at the bottom of the water. The economy of this singular plant is a remarkable confirmation of Linneus's doctrine of the sexes in vegetables. Micheli, who did not admit this doctrine, and considered the male plant not only as a distinct species, but as a different genus from the female, remarks, that it is wonderful in these flowers, that before they open they are separated from the plant, and being raised to the surface, open suddenly with a kind of elastic force, and the segments of the petals are bent downwards: in this state they swim at large upon the surface, and during summer and autumn are in such quantities as in some places to whiten the whole surface of the water. The female plant, the same author informs us, is found in such quantities in the great ditches about Pisa, that the roots in some parts occupy the whole bottom, and the leaves cover the surface in such a manner as to impede the passage of the barges along them. Linneus found it in abundance in the rivulets of Finmarch, but did not observe it to flower either there or at Upsal; it has occurred in Switzerland, and grows in the Rhone near Orange.

2. Vallisneria Octandra; *Eight-stamined Vallisneria.* Flowers eight-stamined; root annual, fibrous. The economy of this species, though something similar, is not so curious as that of the preceding, but the end of impregnation is answered equally.—Native of the East Indies, in stagnant shallow sweet water.

3. Vallisneria Americana; *American Vallisneria.* Leaves erect, linear; male and female peduncles straight.—Discovered by Pursh in 1800, in the Delaware, near Philadelphia. It grows at the bottom of muddy and slow-flowing rivers.

4. Vallisneria Nana; *Dwarf Vallisneria.* Stalk of the female flowers spiral, capillary; leaves under water, linear, acute, entire.—Found in New Holland.

Vandellia; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, tubulous, four-parted; parts subovate, equal, the uppermost subbifid, permanent. *Corolla:* one-petalled, ringent; tube length of the calix; border small, its upper lip ovate, entire, lower dilated, two-lobed. *Stamina:* filamenta four, two outer from the disk of the lower lip, bowed upwards, two from the throat higher; antheræ ovate, connected by pairs. *Pistil:* germen oblong; style filiform, length of the stamina; stigmas two, ovate, membranaceous, reflexed. *Pericarp:* capsule oblong, one-celled. *Seeds:* numerous. Essential Character. *Calix:* four-parted. *Corolla:* ringent. *Filamenta:* the two outer from the disk of the lip of the corolla. *Antheræ:* connected by pairs. *Capsule:* one-celled, many-seeded.——The species are,

1. Vandellia Diffusa. Leaves roundish, subsessile, smooth above. Stem herbaceous, four-cornered, brachiate; flowers axillary, opposite, solitary.—Native of the islands of Montserrat and Santa Cruz.

2. Vandellia Pratensis. Leaves petioled, oblong, acute, crenate. Root annual; stem herbaceous, erect, four-cornered, with the corners acute, brachiate; branches of the same structure; flowers axillary, sessile, small; petioles very short.—Found in America, from the island of Trinidad to Brasil, by way-sides.

Vangueria; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* very small, five-toothed, spreading. *Corolla:* small, companulate, globular, five-cleft, hairy at the throat. *Stamina:* five; with oblong antheræ scarcely standing out. *Pistil:* one; with a bilamellate stigma. *Pericarp:* berry inferior, pome-shaped, umbilicate, not crowned, five-celled. *Seeds:* four or five, like almonds. Essential Character. *Calix:* five-toothed. *Corolla:* tube globular, with a hairy throat. *Stigma:* bilamellate. *Berry:* inferior, four or five seeded.——The only species yet discovered is,

1. Vangueria Edulis. Leaves petioled, opposite, ovate, attenuated to both ends, smooth, quite entire; peduncles axillary, three or four times dichotomously branched; flowers pedicelled; fruit esculent. It is a tree, with round, smooth, opposite branches; supposed to be a native of China or of Madagascar.

Vanilla. See *Epidendrum Vanilla.*

Varnish Tree. See *Rhus.*

Varronia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, tubular, with five slender recurved teeth, permanent. *Corolla:* one-petalled, tubular, cylindric; border five-parted, spreading. *Stamina:* filamenta five, awl-shaped, length of the corolla; antheræ incumbent, oblong. *Pistil:* germen ovate; style filiform, length of the corolla; stigmas four, bristle-shaped. *Pericarp:* drupe ovate, one-celled, enclosed by the calix, free. *Seed:* nut four-celled, roundish. Essen-

TIAL CHARACTER. *Calix:* tubular. *Corolla:* five-cleft. *Drupe:* with a four-celled nut.——The species are,

1. Varronia Lineata; *Round-spiked Varronia.* Leaves lanceolate, marked with lines; peduncles lateral, growing to the petioles; spikes globular. This shrub is from four to five feet in height, with many slender, round, downy, crooked, entangled, leafy branches. Browne says the nuts are two-celled, and that it seldom rises above three or four feet high. —Native of Jamaica.

2. Varronia Bullata; *Blistered Varronia.* Leaves ovate, veined, and wrinkled; spikes globose. This is a shrub a fathom in height, warted, with round rough-haired branches; flowers clustered in little roundish balls; corollas small, white.—Native of Jamaica, in dry coppices near the sea, flowering in spring.

3. Varronia Mirabiloides; *Salver-flowered Varronia.* Leaves ovate, wrinkled, serrate; flowers racemed, directed one way; corolla salver-shaped. Stem from two to three feet high, or more, frutescent, branched, erect, rough-haired; branches nearly upright, stiff, hairy, with the hairs pressed close. Jacquin calls it the most elegant shrub of the genus, and says, that the flowers in size and form resemble those of Marvel of Peru; they are white, handsome, and void of smell. —Native of St. Domingo, where the French call it *Dent de Chienblanc.*

4. Varronia Martinicensis. Leaves ovate, acuminate; spikes oblong. This shrub is about six feet high.—Native of Martinico, on the borders of woods.

5. Varronia Globosa; *Globular-spiked Varronia.* Leaves lanceolate, oblong; stem dichotomous; peduncles axillary, elongated, naked; spikes globular. This differs from the preceding species in having the spikes constantly globular, the segments of the corollas emarginate, and the stigma blunt and fourfold.—Native of the West Indies.

6. Varronia Curassavica; *Long-spiked Varronia.* Leaves lanceolate; spikes oblong. Stem shrubby, a fathom in height, upright; branches and branchlets rugged, ferruginous; flowers clustered, sessile, biggish, white.—Common by the lower woody lands of Jamaica, where it is generally found climbing or leaning on the neighbouring shrubs, flowering in summer and autumn.

7. Varronia Angustifolia; *Narrow-leaved Varronia.* Leaves linear, rugged, somewhat toothed; spikes linear-oblong. A shrub.—Native of the island of Santa Cruz.

8. Varronia Alba; *White-fruited Varronia.* Leaves cordate; flowers cymed; spikes roundish. This tree often reaches the height of thirty feet, and the trunk becomes half a foot in diameter, but when planted in hedges it becomes shrubby. Cymes ample, not unfrequently six inches in diameter, having numerous whitish flowers, without scent; drupe somewhat oblong, half an inch in length, whitish, subpellucid; pulp whitish, sweet, insipid, glutinous; nut oblong, striated, black.—Native of Carthagena and Curaçao, where the nut is eaten.

9. Varronia Monosperma; *One-seeded Varronia.* Leaves ovate, rugged, quite entire at the base; spikes cymed. Stem twelve feet high; flowers small, white, in little globular heads; drupe scarlet, the size of a pea.—Native of the Caraccas.

Vateria; a genus of the class Polyandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-cleft; segments acute, permanent. *Corolla:* petals five, ovate, spreading. *Stamina:* filamenta numerous, shorter than the corolla; antheræ vertical, awl-shaped, with two capillary points. *Pistil:* germen roundish; style simple, short; stigmas capitate. *Pericarp:* capsule turbinate, coriaceous, placed on the reflexed calix, marked with three sutures, one-celled, three-valved. *Seed:* one, ovate. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Corolla:* five-petalled. *Capsule:* three-valved, one-celled, one-seeded.——The only species is,

1. Vateria Indica. A tall handsome tree, with wide extended branches, and a thick bark, which when wounded discharges a resin, which becomes yellow, and brittle like glass. —Native of the East Indies.

Vatica; a genus of the class Dodecandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, five-parted, obtuse at the base, erect; segments lanceolate, shorter than the corolla. *Corolla:* petals five, sessile, elliptic, large. *Stamina:* filamenta none; antheræ fifteen, sessile, very short, four-celled, the two outer cells terminated by a spine interposed between them, the two inner shorter by half, without any spine. *Pistil:* germen conical, five-cornered; style cylindrical, five-striated; stigma obtuse. *Pericarp:* capsule three-celled. *Seed:* one in each cell. ESSENTIAL CHARACTER. *Calix:* five-cleft. *Petals:* five. *Antheræ:* fifteen, sessile, four-celled.——The only species known is,

1. Vatica Chinensis. This appears to be a tree, having the same appearance with *Vateria Indica;* to which it is nearly allied, differing in the number and form of the stamens, but resembling it in the fruit.—Native of China.

Velezia; a genus of the class Pentandria, order Digynia. —GENERIC CHARACTER. *Calix:* perianth one-leafed, filiform, five-cornered, permanent; mouth five-toothed, acuminate, erect, very small. *Corolla:* petals five, very short, emarginate, two-toothed; claws filiform, length of the calix. *Stamina:* filamenta five, often six, capillary, scarcely the length of the calix; antheræ cordate. *Pistil:* germen cylindric, short, terminated by the receptacle of the styles; styles two, filiform, length of the stamina; stigmas simple. *Pericarp:* capsule cylindric, covered, one-celled. *Seeds:* numerous, in a single row. *Observe.* There are often six stamina, but the natural number is five, as later observations have proved. ESSENTIAL CHARACTER. *Calix:* filiform, five-toothed. *Corolla:* five-petalled, small. *Capsule:* one-celled. *Seeds:* numerous, in a single row.——The only known species is,

1. Velezia Rigida. Stems upright, jointed, round, pubescent, three or four inches high; branches slender, often divaricating; leaves opposite, awl-shaped, striated, pubescent, sheathing at the base; flowers axillary, solitary, or sometimes, but seldom, two or three together, along the stem and branches, on short pedicels; corolla small, a little longer than the calix; border rose-coloured, slightly emarginate. Annual.—Native of the south of Europe, &c.

Vella; a genus of the class Tetradynamia, order Siliculosa. —GENERIC CHARACTER. *Calix:* perianth four-leaved, erect, cylindric; leaflets linear, obtuse, deciduous. *Corolla:* four-petalled, cruciform; petals obovate, spreading; claws length of the calix. *Stamina:* filamenta six, length of the calix, the two opposite ones a little shorter; antheræ simple. *Pistil:* germen ovate; style conic; stigma obtuse. *Pericarp:* silicle globose, entire, two-celled, with a partition twice as large as the silicle, ovate beyond it, and erect. *Seeds:* few, roundish. *Observe.* The second species has the four larger filamenta destitute of anthers, and coadunate by pairs. ESSENTIAL CHARACTER. *Silicle:* with a partition twice as large as the valves, ovate on the outside.——The species are,

1. Vella Annua; *Annual Vella,* or *Cress Rocket.* Leaves pinnatifid; silicles pendulous. Root annual, small, fibrous; stem branched, leafy, hispid with bristles bent down; flowers pedicelled; petals obovate, entire, whitish, or very pale yellow, with deep purple veins, and very slender claws. It

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VERBASCUM PHLOMOIDES ___ *Southern Woolly Mullein.*

VERATRUM ALBUM ___ *Common White Hellebore.*

H. Robinson

Published by Fisher, Son & Co., London, 1838.

flowers in June.—Found in Valencia, in Spain; and in England, on Salisbury Plain, not far from Stonehenge. If the seeds be permitted to scatter, the plants will come up and thrive very well; or, if they be sown in autumn, they will succeed much better than when sown in the spring. As they ought not to be transplanted, the seed must be sown where they are to remain, and only require thinning and weeding.

2. Vella Pseudo-cytisus; *Shrubby Vella.* Leaves entire, obovate, ciliate; silicles erect. Stem shrubby, two feet high, somewhat rugged, very much branched; leaves alternate, rather fleshy, scarcely an inch long; flowers in spikes, terminating the stem and branches; petals yellow, orbicular, variegated with paler veins; claws filiform, slightly channelled within, a little longer than the calix.—Found near Aranjuez in Spain, where it flowers and fruits in May. It is increased by seeds, like the preceding species, and will continue two or three years.

Veltheimia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* of one petal, tubular, nearly cylindrical; limb regular, in six very short, broad, almost equal segments. *Stamina:* filamenta six, thread-shaped, inserted into the tube, and not projecting beyond it; antheræ ovate, cloven at the base. *Pistil:* germen superior, roundish; style thread-shaped, declining; stigma simple, acute. *Pericarp:* capsule membranaceous, somewhat pellucid, three-lobed, three-celled, each lobe extended into a compressed rounded wing. *Seeds:* mostly solitary, obovate, rather compressed. Essential Character. *Corolla:* tubular, with six teeth. *Stamina:* inserted into the tube. *Capsule:* membranaceous, with three wings, and three cells, with solitary seeds.——The species are,

1. Veltheimia Viridifolia; *Wave-leaved Veltheimia.* Leaves lanceolate, obtuse, with wavy plaits; teeth of the corolla rounded, erect. It flowers copiously in the winter and spring, but is not easily increased either by root or seed.—Native of the Cape. See *Aletris.*

2. Veltheimia Glauca; *Glaucous-leaved Veltheimia.* Leaves lanceolate, glaucous, tipped with a small point, somewhat crisped at the margin; teeth of the corolla spreading. It is not so handsome as the preceding, and is more difficult of culture. It flowers from January to April.—Native of the Cape.

Ventilago; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* one-leafed, tubular, indistinctly ten-striated within the margin, which is quite entire and toothless. *Corolla:* scales protecting the stamina. *Stamina:* filamenta five, inserted into the calix; antheræ of two rounded lobes. *Pistil:* germen superior, nearly globose; style short, cloven half way down; stigmas two, divaricated, acute. *Pericarp:* capsule superior, globular, surrounded near the middle with the remaining nectary, and terminating in a long linear membranous wing, one-celled, not opening of itself. *Seed:* solitary, round. Essential Character. *Calix:* tubular. *Corolla:* scales protecting the stamina, which are inserted into the calix. *Capsule:* winged at the top, and one-seeded.——The only known species is,

. Ventilago Maderaspatana. Stem woody, climbing to a great extent, with long, round, pliant, tough, leafy, often downy branches; leaves alternate, on short petioles, two-faced, ovate, most slightly serrate, smooth, three or four inches long; paniele terminating; flowers very numerous, small, of a dirty greenish white, smelling very strong and offensive, not unlike Sterculia Fœtida.—This shrub is generally dicœcious, and a native of the forests and other uncultivated places among the mountains of Hindoostan and Ceylon, where it flowers during the cold season; and the natives of the mountains apply the bark, in a green state, to many useful purposes, as cordage.

Venus's Comb. See *Scandix.*

Venus's Fly-trap. See *Dionœa.*

Venus's Looking-glass. See *Campanula.*

Venus's Navelwort. See *Cynoglossum Linifolium.*

Veratrum; a genus of the class Polygamia, order Monœcia.—Generic Character. *Hermaphrodite. Calix:* none, unless the corolla be considered as such. *Corolla:* petals six, oblong, lanceolate, thinner at the edge, serrate, permanent. *Stamina:* filamenta six, awl-shaped, pressing the germina, more spreading at the tips, shorter by half than the corolla; antheræ quadrangular. *Pistil:* germina three, erect, oblong, ending in scarcely apparent styles; stigmas simple, patulous. *Pericarp:* capsules three, oblong, erect, compressed, one-celled, one-valved, gaping inwards. *Seeds:* many, oblong, blunter at one end, compressed, membranaceous, fastened in a double row. *Male Flower:* on the same plant, below the hermaphrodite. *Pistil:* an indistinct vain rudiment. Essential Character. *Calix:* none. *Corolla:* six-petalled, permanent, sessile, equal, bearing the stamens. *Styles:* permanent. *Capsules:* three, bursting at the inner edge. *Seeds:* numerous, compressed, imbricated, winged at each end.——The species are,

1. Veratrum Album; *White-flowered Veratrum,* or *White Hellebore.* Raceme superdecompound; corollas erect. Root perennial, composed of many thick fibres, gathered into a head; stem from two to four feet high, stout, erect, simple, leafy; leaves oblong, ovate, ten inches long and five broad in the middle, rounded at the end, and having many longitudinal plaits like those of Gentian. The branches and principal stem are terminated by spikes of flowers, set very close together, of a greenish-white or herbaceous colour, appearing in July. Every part of this plant, as well as the roots, is extremely acrid and poisonous; the leaves and seeds have proved deleterious to various animals. Notwithstanding its virulence, it has been given internally in mania, epilepsy, &c. but the diseases in which its efficacy seem least equivocal, are those of the skin, as scabies and different prurient eruptions, herpes, morbus pediculosus, leprosy, and scrofula; in many of these it has been successfully employed, both internally and externally. As a powerful stimulant and irritating medicine, its use has been resorted to only in desperate cases; and then, it is first to be tried in very small doses, in a diluted state, and to be gradually increased according to its effects. Greding, who employed it in a great number of maniacal cases, gave the bark of the root, collected in spring, in powder; beginning with one grain, and gradually increasing the dose. He also sometimes used the extract, prepared after Stoerck's method. The root, while yet fresh, has a strong disagreeable smell, and a nauseous, bitterish, acrid, penetrating, and very durable taste. Taken inwardly in doses of only ten or fifteen grains, it operates both upwards and downwards with great violence, and has sometimes brought on convulsions and other alarming symptoms. It has been remarked to affect the upper part of the throat in a very peculiar manner, causing a kind of strangulation or suffocation, with extreme pain and anxiety. It has been employed in cases of lunacy, and in apoplexies, with success, when all other means commonly made use of have been ineffectual. For the gout, Mr. Moore gives the following preparation: Take of the root, thinly sliced, eight ounces, to be infused for ten days in two pints and a half of white wine. It is to be then filtered through paper. The

dose is from one to three fluid-drachms. The root was formerly given in small doses, to quicken other purgatives and emetics, and sometimes as an alterative in obstinate chronical disorders; for which last intention it is, without doubt, a medicine of great efficacy, but its effects are not ascertained with any degree of precision.—To propagate this plant, sow the seeds as soon as they are ripe, either in a bed or box, filled with light fresh earth, and keep the ground constantly clean from weeds. In the spring the plants will appear, and must be carefully weeded, and in dry weather refreshed with water. In the following autumn, when their leaves decay, prepare a bed of fresh light earth, take up the young plants carefully without breaking their roots, and plant them about six inches square: let them remain until they are strong enough to flower, when they should be transplanted into the borders of the pleasure garden. But as these plants seldom flower in less than four years from seeds, this method of procuring them is not much practised in England. When once obtained, they are easily increased by parting their roots in autumn, when their leaves decay: but care must be taken not to part them too small, as that will prevent their flowering in the following summer. Plant them in a light fresh rich soil, and do not remove them oftener than once in three or four years. They form pretty ornaments when planted in the middle of the pleasure garden, and should not be placed near fences which harbour snails, as those vermin devour the leaves, and destroy their appearance.

2. Veratrum Viride; *Green-flowered Veratrum.* Raceme superdecompound; corollas bell-shaped, with the claws thickened at the side within. A stately plant, from three to six feet high.—Native of North America.

3. Veratrum Nigrum; *Dark-flowered Veratrum.* Raceme compound; corollas spreading very much. Root perennial. It is very nearly allied to the first species, but differs in place of growth, colour, villose peduncles, spreading corolla, and compound raceme, not subdivided into a panicle. It is also less strong and acrid.—Native of Austria and Siberia.

4. Veratrum Luteum; *Yellow-flowered Veratrum.* Raceme quite simple; leaves sessile; root tuberous and large. Between the leaves there comes out a single stem nearly a foot high; the flowers are produced at the top, in a single thick close spike: they are small, and of a yellowish-white colour.—Native of North America.

5. Veratrum Parviflorum. Racemes paniculate; branches filiform; flowers pedicellate, stellate, small, green; petals oval-lanceolate; leaves oval or lanceolate, plane, glabrous.—Grows on the high mountains of Carolina.

6. Veratrum Angustifolium. Plant lofty, dioicous; panicle simple; petals linear; leaves very long, linear, keeled; flowers greenish-yellow.—Grows on the high mountains of Virginia and Carolina.

Verbascum; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, small, permanent; segments erect, acute. *Corolla:* one-petalled, wheel-shaped, a little unequal; tube cylindric, very short; border spreading, five-parted; segments ovate, obtuse. *Stamina:* filamenta five, awl-shaped, shorter than the corolla; antheræ roundish, compressed, erect. *Pistil:* germen roundish; style filiform, rather longer than the stamina, inclined; stigma thickish, obtuse. *Pericarp:* capsule roundish, two-celled, two-valved, opening at top; receptacles half ovate, fastened to the partition. *Seeds:* numerous, angular. *Observe.* In most of the species the stamina are inclined and unequal, and clothed at bottom with coloured villose hairs. Essential Character. *Corolla:* wheel-shaped, a little unequal. *Stamina:* distant, declined, bearded. *Capsule:* two-celled, two-valved, many-seeded. *Stigma:* simple.—The plants of this genus, as they require little care, may be allowed a place in the borders of large gardens, for the variety of their hoary leaves, and the sweetness of the flowers, which have a scent somewhat like violets. If the seeds be permitted to scatter they will come up without care, but as they frequently lie dormant a whole year, the ground should not be disturbed. Most of the species are biennial, and may be increased by sowing their seeds in August, on a bed of light earth, in an open situation, where the plants will sometimes come up in the following month, and in a dry soil will endure the cold of winter. In February, transplant them where they are to remain, not nearer than two feet asunder: they flower in June, and ripen seeds in August and September.——The species are,

1. Verbascum Thapsus; *Great Mullein.* Leaves decurrent, tomentose on both sides; stem simple. Root biennial, spindle-shaped; stem from three to five feet high, erect, woolly, winged with decurrent acute leaves, clothed with entangled starry wool; spike terminating, erect, cylindrical, many-flowered; flowers sessile, closely set, bright yellow, sometimes, but rarely, white. There are some varieties. The leaves, and the whole of the herb, are mucilaginous, and are recommended both as internal and external emollients. A pint of cow's milk, with a handful of the leaves, either of this or the seventh species, boiled in it to half a pint, sweetened with sugar, strained, and taken at bed-time, is a pleasant and nutritious medicine for allaying a cough; and more particularly for taking off the pain and irritation of the piles, to which it is often externally applied: it is also used as an injection in tenesmus. In diarrhœas of an old standing, the decoction is employed to mitigate the pain of the intestines: for this purpose two ounces of the leaves are boiled in a quart of water, and four ounces are given every three hours. Its great use in the pulmonary complaints of cattle, has obtained for it the name of Cow's Lungwort; and it is well known to the country cow-leeches under the name of Murrain Grass, which is a corruption of Mullein. The French call it *Bouillon blanc*, and use an infusion of the flowers in coughs, supposing them to possess anodyne and pectoral virtues; but it does not appear to possess much of the narcotic powers, for which most of its natural order are distinguished. This is a plant of considerable virtues, though but little regarded. It is good in nervous disorders, and few things are better against inveterate headaches, for which purpose it is best taken in powder, about a scruple for a dose, and the use of it continued for some time. The juice, boiled to a syrup with honey, is excellent in coughs and other disorders of the breast, and a strong infusion of the leaves is good against obstructions of the viscera, particularly the spleen. It is a powerful restringent. The root, dried and powdered, is good in the bloody flux, after the bowels have been emptied of their acrid contents, by means of a gentle dose or two of rhubarb: the dose is fifteen grains, or a scruple. The juice of the root, expressed with red wine, checks immoderate flowings of the menses, and is, alone, a most excellent medicine for spitting of blood. The seeds are said to stupify fish so much, that they may be taken with the hand. In addition to the names of this plant, already given, Gerarde enumerates Woollen, Hig Taper, Torches, Lungwort, Bullock's Lungwort, and Hare's-beard. Dr. Withering adds, Ladies' Foxglove; and it is probable that the above alteration by Gerarde, from Mullein to Woollen, is correct, especially as the Dutch call it Wullkraut. Hig Taper is altered to High Taper in almost all modern books; but as it is called Hag Taper in the north, of which Hig Taper is a

slight corruption, that appears to be the true name, alluding to its alleged efficacy in incantations.—Frequent throughout Europe, on banks and waste ground, flowering in July and August.

2. Verbascum Thapsoides; *Bastard Mullein.* Leaves decurrent; stem branched. Linneus supposed this to be a male plant, of which the preceding species is the male, and the sixth species the female parent. It agrees with the latter in its branched stem, flowers, and the purple hairiness of the filamenta; and with the former in size, and in the leaves being decurrent, but not totally, and less white.—It appeared first in the Botanic Garden at Upsal, but is said to have been before observed by Agerius.

3. Verbascum Boerhaavii; *Annual Mullein.* Leaves sublyrate; flowers sessile. Root annual; corollas yellow, with the stamina and pistilla purple: the flowers have an agreeable scent at a little distance, but if smelt nearer, or too long, it ceases to be so pleasant. They appear in June and July.—Native of the south of Europe.

4. Verbascum Hæmorrhoidale; *Madeira Mullein.* Leaves ovate-oblong, attenuated at the base, tomentose, indistinctly crenulate; racemes spike-form, elongated; bundles of flowers without bractes. It flowers from June to August: biennial. —Native of Madeira.

5. Verbascum Phlomoides; *Woolly Mullein.* Leaves ovate, tomentose on both sides, the lower ones petioled. Root biennial; stem erect, spiked, very tomentose; racemes spike-shaped, with scattered lanceolate bractes, within each of which are four golden-yellow flowers, the middle ones blowing first, then the lowest, and lastly the two lateral ones. It flowers in June and July.—Native of Italy, Germany, and the south of France.

6. Verbascum Lychnitis; *White Mullein.* Leaves wedge-oblong, lanceolated above; stem angular, panicled, seldom more than three feet high; root biennial; flowers pedicelled, in bundles, cream-coloured, with yellow filamenta, and saffron-coloured antheræ. This species is remarkable for its straight wandlike angular stalk, its leaves very white beneath, but green with a slight hoariness above, and its cream-coloured flowers, which are produced in great numbers, in a compound clustered terminating raceme.—Native of pastures, road-sides, and waste ground, in Europe. Found plentifully in Kent; in the lanes about Dartford; and at Kniver, near Rock-houses, in Staffordshire.

7. Verbascum Pulverulentum; *Yellow Hoary Mullein.* Leaves ovate-oblong, subserrate, mealy on both sides; stem round, panicled, three or four feet high, branched from top to bottom in a conical form, covered with innumerable golden flowers; root biennial. The whole plant is covered with a mealy down, which easily rubs off, and when seen in a microscope, is found to consist of numerous starry entangled atoms. It has the inflorescence of the preceding species, but is more branched, and the corolla is larger, and of a brighter yellow colour. The filamenta are bearded with pale or white hairs, and the antheræ are vermilion. A singular instance of irritability has been observed in this, and other plants of this genus. In still warm weather, if two or three smart blows be given to the stem with a stick, all the corollas which are then open, though not immediately loosened, fall off in a few minutes, separating one after another from their base; and the calix closes round the germen, seeming as it were to push off the blossom. Dr. Smith has noticed a male plant, found near Hellesdon, in Norfolk, produced from this species, impregnated with the pollen of the ninth; having the habit of the former, and purple-haired filamenta like the latter, with the leaves more neatly crenate than in this species; the root-leaves petioled; the stem and petioles purple. —Native of Europe. Common in many parts of Norfolk and Suffolk, as about Norwich and Bury; in waste ground, hedges, and the borders of fields, flowering in July; at which time it forms a golden pyramid a yard high, consisting of many hundreds of flowers, and is unquestionably one of the most magnificent of British plants.

8. Verbascum Ferrugineum; *Rusty Mullein.* Leaves subvillose, wrinkled; stem-leaves subsessile, equally crenate; root-leaves oblong-cordate, doubly crenate. Root perennial. The flowers are disposed in a long loose spike, on the upper part of the stalk; they come out upon short slender pedicels, three or four from the lower joints; above these there are two at each joint, and at the top they are single: they are of a rusty iron colour, and larger than the common sort. It is well known in gardens, by the name of *Iron-coloured Moth Mullein.*—Native of the south of Europe. This and the eleventh species, having perennial roots, and seldom producing good seeds in England, are increased by offsets taken in autumn, allowing them time to get good root before winter, otherwise they will not flower in the following summer. These plants thrive best in a sandy loam, and should be planted in an eastern border, having only the morning sun, for they do not thrive well when much exposed to his beams.

9. Verbascum Nigrum; *Dark Mullein.* Leaves oblong-cordate, petioled, waved, crenate, subpubescent; cluster solitary, spiked, many-flowered. Root perennial; stem stiff and straight, angular, striated, purplish, sometimes pubescent, little branched; spike terminating, for the most part solitary, many-flowered, but not very compact, longer and more simple than in most of the other species; flowers in bundles, about seven in a set, pedicelled. The beauty of its golden-coloured corolla is much enriched by the tints of purplish brown at the mouth of the tube, the purple-haired filamenta, and the saffron-coloured antheræ. It varies sometimes with white flowers; and Gmelin mentions a lower variety, with a funnel-form, herbaceous, or proliferous flower. —Native of Europe, in a calcareous or gravelly soil: flowering about midsummer, and lasting till September. It abounds in Kent, and in the hedges of those retired grassy lanes so frequent in Norfolk and Suffolk: it has been found in the calcareous parts of Cambridgeshire, and in the sandy soils of Bedfordshire; at Nettlebed, Henley, and Stokenchurch, in Oxfordshire; between Birmingham and Walsall; about Hampstead, near Richmond Bridge, at Strand on the Green, and about Harefield, in Middlesex; at Crayford, Shooter's hill, Charlton, Blackheath, Lewisham, Woolwich, Warren, Bromley, West Wickham, Plumstead, Bexley, Westerham, Orpington, Dartford, and Ospringe, in Kent; on Dupper's hill, near Croydon; about Esher and Godalming, in Surry; and Tillington, in Sussex.

10. Verbascum Virgatum; *Large-flowered Mullein.* Leaves oblong-lanceolate, toothed, sessile; root-leaves sublyrate, pubescent; stem branched; flowers aggregate, subsessile. Root biennial, thick, branched, whitish, bitter. This plant is nearly allied to the twelfth species, but does not seem to be a variety of it, or a male, for that does not grow where this is found, and it may be copiously propagated by seed.—It flowers in August and September, and was first observed in a field near Wrexham.

11. Verbascum Phœniceum; *Purple Mullein.* Leaves ovate, naked, crenate, radical; stem almost naked, racemed; root biennial; corolla deep purple. It flowers from May to July.—Native of the south of Europe and of Germany.

12. Verbascum Blattaria; *Moth Mullein.* Leaves embracing, oblong, smooth, serrate; peduncles one-flowered,

solitary. Root annual, fusiform; stem about three feet high, erect, branched, leafy, angular, smooth; flowers peduncled, solitary, yellow, streaked more or less with purple, having each a single ovate bracte at the base of the peduncle. The upper part of the stem, as well as the germen, calix, bractes, and upper leaves, are clothed with short hairs tipped with minute globes. There is a variety, with oblong smooth dark green leaves; stem three or four feet high, from the sides of which the flowers come out singly; corollas white within, with a little blush of red on the outside.—Native of the south of Europe, Germany, Switzerland, and England, in clayey and gravelly soils. It is found about Plymouth and Ashburton in Devonshire; by the river Medway, near Rochester, and between Deptford and Greenwich in Kent; and also between Mitcham common and Carshalton, in Surry. It is frequently cultivated in gardens, where it is very ornamental, flowering from July to November, in mild weather.

13. Verbascum Gallicum; *French Mullein.* Leaves subvillose, cordate, petioled, toothed; root-leaves pinnatifid at the base. Root biennial; stem about two feet high, dividing at the upper part into several branches spreading out at right angles; flowers middle-sized, yellow, with purple haired filamenta. This appears to have been confounded with the ninth species, from which it differs principally in the leaves, the disposition of the branches, and their pubescence.—Native of Dauphiny.

14. Verbascum Sinuatum; *Scollop-leaved Mullein.* Root-leaves pinnatifid, repand, tomentose; stem-leaves embracing, almost naked; stem panicled, many-flowered. Root biennial; flowers sessile, glomerate, in an uninterrupted spike; corolla small, yellow. It flowers in July and August.—Native of the south of France, Italy, and Barbary.

15. Verbascum Pinnatifidum. Leaves linear-lanceolate, pinnatifid; segments obtuse, toothed; stem panicled, many-flowered. The stem is erect, a foot high, tomentose at the base, becoming smooth by age, round, branched at bottom; flowers sessile, crowded, yellow, hoary externally, with orange-coloured stamens.—Found in the islands of the Archipelago.

16. Verbascum Bamadesii. Stem almost naked; leaves lanceolate, tooth-sinuate, smooth; peduncles one-flowered. Stem a foot high, smooth, quite simple, with a leaf or two at bottom; corolla yellow.—Native of Spain.

17. Verbascum Osbeckii. Leaves gashed, naked; stem leafy; calices woolly; peduncles two-flowered; stems spreading on the ground on all sides, undivided, triangular, nervose. The whole plant has the smell of musk. Biennial. It flowers in July and August.—Native of Spain.

18. Verbascum Spinosum; *Thorny Mullein.* Stem leafy, spiny, frutescent. This is a shrub a foot high, stiff, and very much branched; branches alternate, round, tomentose, hoary; peduncle ending in a spine; corolla small, yellow, tomentose on the outside; capsule the size of a Coriander seed, smooth.—Native of Candia or Crete.

19. Verbascum Myconi; *Borage-leaved Mullein.* Leaves woolly, radical; scape naked. Roots perennial, composed of slender fibres. From among the leaves rise several scapes or slender stalks, about four inches high, which divide into three or four pedicels, at the top hairy, and of a brownish colour, each sustaining one large flower of a fine blue, so deeply divided as to appear to be five-petalled. It could not be supposed from the habit of this plant that it belonged to this genus, most of the plants being tall and showy, with leafy stems, and long spikes of generally yellow flowers; whereas this species is of very humble growth, but having large and highly ornamental flowers of a bluish purple colour, it is a very desirable plant to cultivate, especially for adorning rock-work.—Native of the Pyrenees, where it grows spontaneously, and is lower than in our gardens, with a more woolly foliage, enriched with various tints. It is perennial, and usually propagated by offsets, which come out from the sides of the old plant, and should be taken off in autumn, and planted in small pots filled with light sandy earth: they must always have a shady situation, for they will not thrive when exposed to the sun: being very hardy, it will grow in almost any soil, but requires a northern aspect in summer, and careful watering in dry weather.

20. Verbascum Claytoni. Leaves amplexicaul, sublanceolate-oblong; stem-leaves inciso-crenate; pedicels solitary, one-flowered; flowers yellow, and larger than those of the twelfth species; but of which it appears to be only a variety.—Grows in woods and fields from Virginia to Carolina.

Verbena; a genus of the class Diandria, order Monogynia; or, of the class Didynamia, order Gymnospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, angular, tubular, linear, five-toothed, the fifth toothlet truncate, permanent. *Corolla:* one-petalled, unequal; tube cylindrical, straight for the length of the calix, then widening and curved in; border spreading, half five-cleft; segments rounded, almost equal. *Stamina:* filamenta two or four, bristle-shaped, very short, lying within the tube of the corolla, two of them shorter when there are four; antheræ curved in, as many as there are filamenta. *Pistil:* germen four-cornered; style simple, filiform, shorter than the tube; stigma obtuse. *Pericarp:* very slender, and scarcely manifest, or almost none; calix containing the seeds. *Seeds:* two or four, oblong. *Observe.* The fifteenth species bears edunated seeds, and two antheræ, with an inflated calix. ESSENTIAL CHARACTER. *Corolla:* funnel-shaped, almost equal, curved. *Calix:* five-toothed, one of them truncate. *Seeds:* two or four, naked or very thinly arilled. *Stamina:* two or four.——The species are,

* *Two-stamined, two-seeded.*

1. Verbena Orubica; *Betony-leaved Vervain.* Two-stamined: spikes very leafy. This arises with a shrubby stalk nearly three feet high, divided into three or four branches; leaves oblong-ovate, placed by pairs, deeply serrate, deep green above, but hoary beneath. The flowers grow in thick terminating spikes, of about a foot in length, and are large and of a fine blue colour: they come out in July, and, when the weather proves warm, the seeds ripen in autumn.—Biennial, and a native of South America.——This, with all the other plants of this genus that are natives of the same country, or of the West Indies, require care and protection. The seeds should be sown upon a hot-bed early in the spring; and when the plants are fit to remove, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed to bring them forward, shading them in the day-time with mats until they have taken new root, and then treating them as other tender plants from the same countries. The annuals must be kept in the stove, or in a good glass-case when they are become too tall to remain longer under the frames; for if they are placed abroad in the open air, they will not ripen their seeds here, unless the summer be very warm: and where there is a conveniency of having a bark-bed in a glass-case, for plunging some of these tender annual plants, they will thrive much better, and come to greater perfection than those which are placed on shelves. The perennial sorts may be kept in such a glass-case till autumn, allowing them a larger share of air in warm weather, to prevent their drawing up weak as they increase in size; but it must be cautiously performed. They will not thrive if overpotted. Such of these plants as do not produce good

seeds in this climate, may be increased by cuttings during the summer months, in pots of good mould, placing them in the bark-bed of the stove, where they may be preserved many years.

2. Verbena Indica; *Indian Vervain.* Two-stamined: spikes very long, fleshy, naked; leaves lanceolate-ovate, obliquely toothed; stem even. This very much resembles the next species, from which it is distinguished by its stem and branches being smooth. It flowers in August.—Native of Ceylon.

3. Verbena Jamaicensis; *Jamaica Vervain.* Two-stamined: spikes very long, fleshy, naked; leaves spathulate-ovate, serrate; stem rough-haired. The flowers blow in succession, beginning at the bottom, very few together, violet-coloured, with the throat long and slender, incurved; tube white.—Native of Jamaica, Barbadoes, and other West India islands, where this valuable, though common plant, is herbaceous, and when once established spreads fast. Dr. Barham informs us, that the juice alone, or with Contrayerva, infused in wine, is an excellent remedy against dropsies. The bruised leaves, with wheat-flour, applied as a cataplasm, are useful in swellings of the spleen, a disease common in the West Indies, and to discuss hard tumours at their commencement. It is given, as a cooling cathartic and anthelminthic, to children, in doses of one or two table-spoonfuls of the expressed juice. A decoction of the plant with spikenard, is given in dropsies; and a table-spoonful of the juice, four successive mornings, is considered by the negroes, with whom Vervain is a favourite remedy, as an effectual deobstruent and emmenagogue. The expressed juice with water, is also very good for sore, watery, and inflamed eyes. Vervain Tea is likewise frequently drank as a febrifuge and corroborant.

4. Verbena Mutabilis; *Changeable Vervain.* Two-stamined: spikes very long, fleshy, naked; leaves ovate, produced at the base, toothed, rugged, tomentose beneath; stem shrubby. The flowers are at first extremely deep scarlet, and afterwards rose or flesh coloured.—Native of South America.

5. Verbena Aristata; *Awn-bracted Vervain.* Two-stamined: leaves oblong, serrate; spikes elongated; bractes ovate, acuminate, longer than the seed; stem shrubby. This is a shrub, with four-cornered branches of a somewhat ash-coloured purple colour.—Native of South America.

6. Verbena Prismatica; *Prism-caliced Vervain.* Two-stamined: spikes loose; calices alternate, prismatic, truncate, awned; leaves ovate, obtuse. This is a shrub, growing in the Caribbee Islands: the stem and branches are round, smooth, and armed with straight scattered black spines; the racemes are lax, terminal, and axillary, about half a foot long, with the proper footstalks about two inches long, spreading, and at the tips collecting the flowers, which are of a pale yellow, into a roundish head: they are sessile, and of a fragrant smell. Annual.—Native of Jamaica.

7. Verbena Mexicana; *Mexican Vervain.* Two-stamined: leaves ovate, acute, harsh; spikes loose; calices of the fruit reflexed, rounded, twin, hispid. Stalk shrubby, two or three feet high, and divided into several branches, which are terminated by slender loose spikes of small pale purple flowers, the calices of which afterwards become swelled and almost globular; they are reflexed, and set with stinging hairs. The leaves and stem, and especially the seeds, are so hispid as to adhere obstinately to the fingers and clothes. It flowers late, but in good years the seeds ripen in England.—Native of Mexico.

8. Verbena Stœchadifolia; *Oval-spiked Vervain.* Two-stamined: spikes ovate; leaves lanceolate, serrate, plaited; stem shrubby. The stem is woody, spreading five or six feet; flowers on long naked stalks, from the axils, blue, and collected in oval heads: they appear late in autumn, and unless the season prove warm, the seeds rarely ripen in England, but the plants may be kept two or three years in a warm stove.—Native of Jamaica and America.

** *Four-stamined.*

9. Verbena Globiflora; *Globe-flowered Vervain.* Four-stamined: spikes in globular heads; leaves lanceolate, crenate, wrinkled, rugged; stem shrubby, erect, the height of a man; branches erect, round like the stem; flowers sessile, one to each bracte, very close, compressed, white.—Native of South America.

10. Verbena Javanica; *Java Vervain.* Four-stamined: spikes cylindrical; leaves rhomb-ovate, crenate; stem erect; seeds united into a globe.—Native of Java.

11. Verbena Nodiflora; *Creeping Vervain.* Four-stamined: spikes dense, imbricated, ovate; leaves wedge-shaped, toothed; stem creeping. Roots simple, filiform; stem herbaceous, trailing to a great extent; flowers light purple, with dark-red bractes.—Native of the four continents: found near Naples, and in the island of Sicily; in the island of Ceylon; near Cassa in Barbary; in Virginia, North America; in some of the West India islands; and in the isle of Tanna, South Seas.

12. Verbena Bonariensis; *Cluster-flowered Vervain.* Four-stamined: spikes in bundles; leaves lanceolate, embracing. Stem about six feet high, square, rough, clothed with long, harsh, coarsely serrated leaves; flowers blue, appearing late in summer, and not often succeeded by good seeds in England.—Native of Buenos Ayres.

13. Verbena Hastata; *Halberd-leaved Vervain.* Four-stamined: spikes long, acuminate; leaves hastate. This sends up many four-cornered furrowed stalks from the root, which rise five or six feet high.—Native of Canada in North America. This, and the seventeenth species, may be propagated by seeds sown in autumn, or by parting their roots at the same season. They are hardy enough to thrive in the open air, and love a soft loamy soil.

14. Verbena Triphylla; *Three-leaved Vervain.* Four-stamined, panicled: leaves in threes; stem shrubby. Branches spreading very much, rugged; flowers small, pale lilac, in an erect terminating panicle, composed of spiked, striated, villose bractes, with a few leaves intermixed at bottom. The leaves have the flavour of lemon, and are useful in fevers, taken as tea, like Balm, Hyssop, &c.—Native of South America. This elegant shrub, so delightful for its fragrance, may easily be increased by cuttings, and requires only the protection of a good green-house or glass-case. Mr. Curtis suggests, that in some parts of our island, especially near the sea, it would in all probability succeed very well in the open border.

15. Verbena Lappulacea; *Burry Vervain.* Four-stamined: fruiting calices roundish, inflated; seeds echinate. Stem herbaceous, a foot or two high, erect, somewhat branched, brittle, quadrangular, more contracted at the base of the petioles, striated, pubescent; racemes long, loose, composed of scattered flowers, directed one way, of a very pale blue colour, on short pedicels, having very minute bractes under them.—Native of the West Indies; where it is reputed to be a fine vulnerary subastringent, and is commonly applied to bleeding wounds in men or cattle, especially in Jamaica, where it is esteemed to be so powerful a styptic as to stop the hæmorrhage, even when some of the more considerable arteries are cut; and it may be esteemed an excellent application in all manner of sores, where the habit is relaxed.

16. Verbena Forskalæi; *Arabian Vervain.* Four-stamined: fruiting-calices roundish, beaked, reflexed; seeds roundish, wrinkled; leaves ovate-oblong, acute, bluntly serrated; stem herbaceous, erect, four-cornered, smooth. It is very nearly allied to the preceding species, but has a stiffer stem; the leaves more rugged above, with the serratures deeper.—Native of Arabia Felix.

17. Verbena Caroliniana; *Carolina Vervain.* Four-stamined: spikes filiform; leaves undivided, lanceolate, serrate, bluntish, subsessile; root perennial. The stalks rise six feet high, are four-cornered, branch towards the top, and are terminated by sleuder spikes of white flowers, formed into panicles.—Native of Carolina. See the thirteenth species.

18. Verbena Urticifolia; *Nettle-leaved Vervain.* Four-stamined: spikes filiform, panicled; leaves undivided, ovate, serrate, acute, petioled. Stems four-cornered, about three feet high; panicles terminating, long, and slender, composed of small white flowers ranged loosely, appearing in July, and succeeded by seeds, which ripen in autumn.—Native of most parts of North America. This, and the twenty-first and twenty-third species, may be propagated by sowing the seeds in autumn: thin and weed them. If the seeds be permitted to scatter, the plants will come up in the following spring.

19. Verbena Scabra; *Rugged-leaved Vervain.* Four-stamined: spikes filiform; fruiting calices patulous, ovate; leaves ovate, very rugged, serrate; uppermost alternate. Stem herbaceous, erect, four-cornered, villose; flowers alternate or opposite, copious, small, approximating.—Native of South America.

20. Verbena Aubletia; *Cut-leaved Rose Vervain.* Four-stamined: spikes loose, solitary; leaves trifid, gashed. Stem a foot high, sometimes rising to two feet high in gardens; branches from each axil. The extreme brilliancy of its colour renders it a very ornamental green-house plant.—Native of America. In favourable seasons it ripens its seeds readily, and, being biennial, is usually increased by them.

21. Verbena Spuria; *Canadian Vervain.* Four-stamined: spikes filiform; leaves multifid-laciniate; stems numerous; root biennial. The upper part of the stalk branches out into numerous footstalks, forming panicles of blue flowers, appearing in July and August.—Native of North America. See the eighteenth species.

22. Verbena Officinalis; *Common Vervain.* Four-stamined: spikes filiform, panicled; leaves multifid-laciniate; stem subsolitary. Root perennial, branching, woody, sending up, from each of its summits, a solitary stem, about a foot high, curved at the base, acutely quadrangular, smooth, with the exception of some minute hooked prickles; flowers many, small, sessile, each accompanied by a little bracte; corolla of a very pale lilac; seed when young enfolded in one common skin, or tunic, which is almost obliterated as they ripen, and then each appears marked with excavated dots at its upper part. Though this plant is destitute of odour, and manifests to the taste but a slight degree of bitterness and astringency, yet even in modern times it has been accounted a sovereign remedy in a multitude of disorders. Schroder recommends it in upwards of thirty complaints. Bruised, and hung round the neck, it was worn as a charm against inveterate headaches; and in still later times, we are told that the most severe and obstinate headaches have been cured by applying it as a cataplasm. Dr. Home advises a decoction of it made in the proportion of two ounces to a quart, and the same taken in the space of a day, as a good medicine in purgings. It eases pain in the bowels; and is given in clysters with advantage, where there is a desire of going to stool without being able; and is often applied externally to the piles. Among the ancients, it was held sacred, and was employed in making leagues by ambassadors, in sacrificial rites, and in incantations: hence it was suspended about the neck as an amulet, and was thought to be good against serpents and venomous bites, and was reckoned a specific for a variety of diseases.—Native of Europe, Barbary, China, Cochin-china, Japan, and New Holland. In England it occurs by roadsides, in dry sunny pastures, and waste places about villages. It begins to flower in July, and continues through the autumn.

23. Verbena Supina; *Trailing Vervain.* Four-stamined: spikes filiform, solitary: leaves bipinnatifid. Root annual; stems a foot long, roundish, compressed a little, and somewhat pubescent; flowers bluish.—Native of Spain, Portugal, and Algiers.

Verbesina; a genus of the class Syngenesia, order Polygamia Superflua.—Generic Character. *Calix:* common concave: leaflets oblong, channelled, concave, erect, commonly equal, in a double row. *Corolla:* compound radiate; corollets hermaphrodite many in the disk; females about five in the ray; proper of the hermaphrodite funnel-form, five-toothed, erect; female florets ligulate, trifid, and wide or simple, and very narrow. *Stamina:* in the hermaphrodites, filamenta five, capillary, very short; antheræ cylindrical, tubular. *Pistil:* of the hermaphrodite, germen somewhat oblong; style filiform, length of the stamina; stigmas two, reflexed: in the females, the same. *Pericarp:* none, the calix unchanged. *Seeds:* in the hermaphrodite solitary, thickishly angular; pappus of two awl-shaped unequal awns. In the females very like the others. *Receptacle:* chaffy. Essential Character. *Calix:* in a double row. *Florets of the ray:* about five. *Pappus:* awned. *Receptacle* chaffy.——The species are,

1. Verbesina Alata; *Wing-stalked Verbesina.* Leaves alternate, decurrent, waved, obtuse. This is an herbaceous plant, with an upright stem about two feet high, subdivided, round, winged, rough-haired; branches alternate, erect, axillary; peduncles elongated, terminating, pubescent, with flowers in single heads, of a deep orange colour. Perennial. It flowers most part of the summer.—Native of South America, and Jamaica, Curaçao, &c.—Sow the seeds upon a moderate hot-bed in the spring, and when the plants are fit to remove, transplant them to a fresh hot-bed to bring them forward. Shade them till they have taken new root, and then treat them in the same way as other tender annual plants, taking care not to draw them up too weak. In June take them up with balls of earth, and plant them in a warm border, where they may be shaded and watered till they have again took root, after which they will require little care. They will produce good seeds in autumn; but in a stove they may be preserved frequently through the winter.

2. Verbesina Chinensis; *Chinese Verbesina.* Leaves alternate, petioled, ovate-lanceolate, serrate. This is a shrub, with a single round subtomentose stem, and undivided branches from the upper axils of the leaves; flowers terminating, solitary, peduncled; corolla yellow; seeds crowned with a rim and four smooth bristles.—Found in China. Cultivated like the first species.

3. Verbesina Virginica; *Virginian Verbesina.* Leaves alternate, lanceolate, petioled; stem slightly winged; flowers corymbed.—Native of Virginia.

4. Verbesina Pinnatifida; *Pinnatifid-leaved Verbesina.* Leaves alternate, pinnatifid. Native of Jamaica.

5. Verbesina Dichotoma; *Forked Verbesina.* Leaves opposite, ovate, tomentose, petioled; stem dichotomous at top, the outmost internode compressed; flowers solitary, or very rarely two, springing from the divarications of the

branches; corolla white, rather larger than the calix. Annual.—Native of the East Indies.

6. Verbesina Biflora; *Two-flowered Verbesina.* Leaves opposite, oblong-ovate, triple-nerved, acuminate, serrate; peduncles double, two-flowered; flowers yellow.—Native of the East Indies.

7. Verbesina Calendulacea; *Marigold Verbesina.* Leaves opposite, lanceolate, bluntish; peduncles lung, one-flowered; calices simple. Stem herbaceous, annual, a foot high, nearly erect, smooth, whitish; flowers yellow, terminating, solitary.—Native of the East Indies and China.

8. Verbesina Nodiflora; *Sessile-flowered Verbesina.* Leaves opposite, ovate, serrate; calices oblong, sessile, cauline, lateral. Root annual; stem herbaceous, branched, a foot high, round, even; flowers small, yellow, sessile, in the axils of the terminating leaves, two or three together.—Native of the West Indies.

9. Verbesina Fruticosa; *Shrubby Verbesina.* Leaves opposite, ovate, serrate, petioled; stem shrubby. The flowers are yellow, produced from the side of the stalks, and appear in July.—Native of the West Indies.

10. Verbesina Gigantea; *Tree Verbesina.* Leaves alternate, deeply pinnatifid; stem shrubby. The stem is fifteen feet high, and the thickness of a thumb at the lower part, smooth, green, and viscid; it is filled without interruption by a white inodorous pith, as in a rush. From the bosoms of the upper leaves spring round whitish villose peduncles, bearing at their tips the flowers, which are slightly footstalked, and closely heaped together, forming a kind of panicle: the corollets are white, and the antheræ black.—Native of the West Indies.

11. Verbesina Mutica. Leaves trifid-laciniate, serrate; stem creeping; root annual; flowers small, yellow.—Native of the West Indies, in moist pastures.

12. Verbesina Boswallea. Leaves multifid-capillary; stems prostrate; florets six, of which one is female; flowers subsolitary, on short peduncles. It is an esculent plant, with the smell and taste of Fennel.—Native of the East Indies.

13. Verbesina Helianthoides; *Sun-flower Verbesina.* Stem winged; leaves alternate, wide-lanceolate, acute, slightly dentated, albid-villose underneath, rough-pubescent on the upper surface; peduncles one-flowered, aggregate.—Grows in the western parts of the Allegany mountains; and also in Tennessee and Illinois.

Vermin; under this collective name includes all the various sorts of small animals which are injurious to the corn and fruit. The vermin, rats and mice, are the most prejudicial. A rat eats and destroys on the average a quart of corn per week, which, for a hundred of them, amounts to twenty quarters a year; and as a hundred is a very low estimate for a large farm, the real damage is probably much greater. The ravages of mice, are perhaps equally destructive: in the field, the barn, and the dairy, these small vermin are exceedingly disagreeable and destructive, and are supposed to be more pernicious than moles. In order to the destruction of these and other vermin, the author of a late *Calendar of Husbandry* has advised, that a farm should be well provided with a competent number of ferrets, and of true vermin-bred dogs, such as are usually kept for the purpose; and that an hour or two should be spared weekly, and reserved for executing the business. The holes and haunts of the vermin, in and about the premises, are to be diligently sought out, and a war of extermination kept up throughout the year. In aid of these means, others may be adopted when necessary; such as traps, which should be of the cage sort, and not such as to endanger the cats, a most useful sort of domestics, which are fully entitled to care and kindness, provided they do not molest young poultry, and hunt from mere sport rather than to satisfy hunger, as eating the prey injures their health, and lessens their exertions. The ferrets on this account are thought best kept in huts, in the same manner as rabbits; their food is well known to be any sort of offal of the flesh kind, with occasionally a little milk and bread boiled.—The same means of extirpation and removal apply equally to the vermin of the field, pole-cats, weasels, and their different varieties, which, unless checked, invade the farm-yards, and worry not only the poultry, but even young pigs; though it is probable that none of these, nor of their superior in speed and dexterity, the fox, will venture where there are good dogs. A recent method of trapping field vermin, is the following: divide a wooden box, resembling a dog-kennel, by an open wire partition running from end to end, and reaching from the ridge of the roof of it to the floor: re-divide one side of the partition into two parts, large enough to admit a rabbit or a live fowl, as baits; the other half must be formed into a falling box-trap, to take them in: as however it would be extremely cruel to expose live animals to their natural enemies, it appears to be better to kill them at once on the spot, as it is the scent of their fresh blood which allures the vermin.—Vipers, efts, lizards, toads, and other poisonous reptiles, which are both troublesome and hurtful, might be nearly exterminated, if all the inhabitants of each parish would persevere in destroying them wherever they could be found; and their destruction would probably be ensured by giving premiums for them, or for their eggs.—The predatory birds, such as carrion crows, ravens, magpies, kites, hawks, and some others, are most mischievous to poultry, lambs, and even sheep when diseased, whom they then pick in different parts of their bodies. Jays, pigeons, rooks, and many small birds, are chiefly guilty of robbing field produce: bullfinches, and some others, are very destructive among fruit; and the jays, to bean-crops when nearly ripe. Pigeons and rooks destroy large quantities of grain, both at seed-time and harvest; the latter especially attack young crops as they rise, though they are thought to be useful in picking up the grub-worm and other insects. Small birds do most mischief by the destruction of grain which they cause at the time of sowing, and when the corn becomes nearly ripe; besides that which they in some cases do to such buildings as are covered with thatch; but some do good by lessening the number of grubs, caterpillars, and butterflies. In all these cases, perhaps the best and most effectual, though expensive protection, is the gun, though rattles and other things have been invented to frighten or to destroy them.—Grubs and slugs are very destructive to the farmer's crop. The earth-worm, the wireworm, the grub of the cockchafer, the slug, the turnip-fly, the black canker caterpillar, the black insect which destroys Beans, and the yellow maggot which feeds on the ears of Wheat, are of numerous families, and very mischievous. The destruction of these may be attempted in different ways, as, by introducing birds which feed upon them. It has been asserted that worms and slugs which feed on the new roots of corn, may be destroyed by a clean fallow, continued till they perish for want of food. Lime has been said to destroy them, though it is often ineffectually applied for that purpose upon the chalk-hills of Kent.—Hornets and wasps should be sought out and destroyed in their nests, as they are very distressing to cattle, and often render tame animals quite ungovernable.—Game of all sorts is very destructive, not only by what they consume, but because they induce sportsmen to commit great havock in the pursuit. It has been calculated, that the expenses of guard-

ing against, and the damage caused by, vermin and game, on a farm of two hundred acres, half arable and half grass, without sheep-walks, amounts to fifty pounds in the year, which is nearly five shillings each acre upon the whole, which sum it is supposed averages the cultivated corn and grass land farms of Great Britain, and when calculated upon forty millions of acres, supposed to be in cultivation, will amount to ten millions of money per year.—Vermin are as destructive, in proportion, to the Gardener as to the Husbandman, especially rats and mice, which in gardens are best destroyed by traps, having holes large enough to admit rats, but small enough to exclude cats and dogs. Bait the rat-trap with the following: To a pound of good flower add three ounces of treacle, six drops of the oil of carraways; put them all in a dish, and rub them well together till they become properly mixed, and then add a pound of crumbs of bread. Set the traps as near their haunts as possible, but for a few days so as not to fall or strike them as they enter, letting them have free liberty to return at pleasure, which will soon render them fearless. Some of the bait should be also laid at the rat-holes, and a little scattered quite up to the traps; which should be scented with the following mixture: To twenty drops of oil of rhodium, add six or seven grains of musk, and half an ounce of oil of aniseed; shake them well together, in a small phial, before using; then dip a piece of paper or rag in the mixture, and rub each end of the trap therewith, if it be a box-trap; and put two or three drops on the bridge, leaving the paper or rag in the trap. Once a year, the traps, of whatever kind, should be thus scented. Then throw some chaff, mixed with a little wheat, about the bottom of the trap to deceive the rats, which are very sagacious, and will not enter a suspicious place. This will be necessary to be done only at the first time of setting the traps, for after some have been caught and have watered and dunged in them, they will boldly enter where they find others have been before. On this account the trap should never be cleaned when reset. When the rat-holes are found quiet, stop them up with the following composition: A pint of common tar, half an ounce of pearl ashes, an ounce of oil of vitriol, and a good handful of common salt, all well mixed together in an old pan or pot. Lay some of this mixture thickly upon pieces of paper, stop the holes up with them, and build them wholly up with brick or stone, and mortar: the rats will return no more, while either taste or smell remains in this composition. Rats and mice may be most successfully poisoned by arsenic, well levigated, and mixed with strong old cheese and oatmeal. Open traps should also be set for mice, which shun close ones. To destroy slugs in the garden, water the ground with soap-suds and urine, mixed with tobacco-water, which will not only bring them up out of their holes, but destroy their eggs. Snails can only be removed by picking them off. Wasps and flies may be reduced in numbers greatly by hanging up bottles half full of sugar, honey, or grounds of treacle, among the branches of the fruit-trees, and upon the walls also, along the ground at the foot of the walls, and in short all over the garden. Most other insects can only be destroyed by hand, or by smoking tobacco, or sulphur, and washed off by a plentiful stream of water, with lime or soap-suds. The best way to defend fruit-trees from birds, is to cover them with bunting, or nets, both of which unfortunately are very expensive.

Vernonia; a genus of the class Syngenesia, order Polygamia-Æqualis.—Generic Character. *Common Calix:* ovate, imbricated with numerous ovate-lanceolate, pointed, coloured scales. *Corolla:* compound, uniform; all the florets tubular, equal and perfect, of one petal, funnel-shaped: the tube inflexed; border with five recurved segments. *Stamina:* filamenta five, capillary, very short; antheræ united into a cylindrical tube. *Pistil:* germen oblong; style thread-shaped, the length of the stamina; stigmas two, reflexed. *Pericarp:* none, the calix remaining unchanged. *Seeds:* solitary, ovate. *Down:* capillary, coloured, sessile, longer than the calix, surrounded at its base with a very short crown of many chaffy bristles. *Receptacle:* naked, flat. Essential Character. *Receptacle:* naked. *Calix:* ovate, imbricated. *Florets:* tubular, five-cleft. *Seed down:* double; the outer chaffy, short; inner capillary.——The species are,

1. Vernonia Noveboracensis; *Long-leaved Vernonia.* Leaves lanceolate, rough, finely serrated; corymb level-topped; calix-scales with slender points. Stem about four feet high.—It occurs by road-sides, in old pastures, from Canada to Carolina; flowering from August to October.

2. Vernonia Prœalta; *Tall Vernonia.* Leaves lanceolate, serrated, downy beneath; corymb level-topped; calix-scales ovate, pointed.—Found by road-sides, from New England to Carolina; flowering from August to October.

3. Vernonia Fasciculata; *Tufted Vernonia.* Leaves linear, elongated, sparingly serrated; flowers corymbose, erect, crowded; calix ovate, smooth, with pointless scales.—Native of Virginia, and Illinois country; flowering in October.

4. Vernonia Angustifolia; *Narrow-leaved Vernonia.* Leaves crowded, linear, elongated, nearly entire; corymb somewhat umbellate; calix-scales with little rigid points.—It is found in barren sandy woods, from Virginia to Georgia; flowering in August and September.

5. Vernonia Oligophylla; *Few-leaved Vernonia.* Stem simple, nearly naked; leaves serrated; radical ones oblong, ovate, the rest lanceolate; corymb panicled.—Native of South Carolina, in low and swampy Pine forests.

6. Vernonia Anthelmintica; *Worm-seed Vernonia.* Leaves elliptical, serrated, roughish, tapering at each end, most downy beneath; flowers terminating, about three together. The seeds, powdered, and drank with warm water, are used in India to kill intestinal worms in children.—Native of various parts of the East Indies.

Veronica; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth one leafed, four-parted, permanent; segments lanceolate, acute. *Corolla:* one-petalled, wheel-shaped; tube length almost of the calix; border four-parted, flat, with ovate segments; the lowest narrower, the opposite one broader. *Stamina:* filamenta two, narrower at bottom, ascending; antheræ oblong. *Pistil:* germen compressed; style filiform, length of the stamina, declined; stigma simple, obtuse. *Pericarp:* capsule obcordate; compressed at the top, two-celled, four-valved. *Seed:* numerous, roundish. *Obscrve.* The tube of the corolla differs in the several species, but in most very short; in the spiked ones long. Essential Character. *Corolla:* four-cleft, wheel-shaped, with the lowest segment narrower. *Capsule:* superior, two-celled.—The *perennial* plants of this genus may be increased by parting their roots, which may be done every other year, for if they are not often divided, many of them will grow too large for the borders of small gardens; nevertheless they should not be divided into too small parts, because when there is not a number of stems to form a good bunch, the plants make but a mean appearance. Michaelmas is the best time to part the roots, that they may be well established before winter; and when they are removed in the spring, they seldom flower strong in the same year, especially in dry seasons. Those which grow pretty

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P. 739.

VERONICA OFFICINALIS
___ *Common Speedwell.*

P. 747.

VICIA SEPIUM ___ *Bush Vetch.*

P. 736.

VERBENA OFFICINALIS ___ *Common Vervain.*

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G. Doble sc

tall are proper to plant in the borders of ornamental plantations; but those with trailing branches are fit for banks or irregular shady slopes. They are mostly hardy, and require only to be weeded and transplanted every second or third year. The *annual* sorts may be propagated by seeds sown in autumn, and they will maintain their ground, if their seeds be permitted to scatter. All of them will thrive much better if planted in a shady border, than where they may be continually exposed to the sun, as in shade their flowers will continue longer in beauty.——The species are,

* *Spiked.*

1. Veronica Sibirica; *Siberian Speedwell.* Spikes terminating; leaves five to nine in a whorl, lanceolate, sessile. Stem somewhat rough-haired; root perennial; corollets blue, with an oblong tube, and small acute border. It flowers in July and August, and is a native of Siberia.

2. Veronica Virginica; *Virginian Speedwell.* Spikes terminating; leaves in fours or fives. Stems erect, four or five feet high, terminated by long slender spikes of white flowers. It varies with blush-coloured flowers.—Native of Virginia, and Japan.

3. Veronica Spuria; *Bastard Speedwell.* Spikes terminating; leaves lanceolate, equally serrate. Root perennial, sending out many offsets; stems a foot high, with very narrow lanceolate leaves, terminated by long spikes of blue flowers, which appear in June and July. There is also a variety with a flesh-coloured flower.—Native of Siberia and Germany.

4. Veronica Maritima; *Sea-side Speedwell.* Spikes terminating; leaves subcordate-lanceolate, unequally serrate. Stems two feet high, erect, simple, leafy, round below, quadrangular above, finely downy, though occasionally smooth in gardens; the flowers are of a bright blue, and appear in July. It varies like the preceding and following species, with leaves opposite, in threes or in fours; also with blue, bluish, flesh-coloured, and white flowers.—Native of sea-coasts, in Europe.

5. Veronica Longifolia; *Long-leaved Speedwell.* Spikes terminating; leaves lanceolate, acuminate, serrate, ending in the petiole. Stems a foot and half high; leaves two and a half inches long; the stems are terminated by long spikes of blue flowers, which appear in June.—Native of Germany, Austria, and Russia.

6. Veronica Incana; *Hoary Speedwell.* Spikes terminating; leaves opposite, crenate, obtuse. Stem erect, tomentose; flowers deep blue, appearing in June and July.—Native of the rocky summits of mountains in Russia.

7. Veronica Spicata; *Spiked Speedwell.* Spike terminating; leaves opposite, bluntish, crenate, serrulate, quite entire at the tip; stem ascending, simple. Root perennial; corolla deep blue, with the orifice of the tube bearded. Dr. Withering remarks, that the leaves are narrower in proportion to their length, and more pointed than in the next species; that the stamina are much longer than the corolla; and that the antheræ, as well as that, are blue. In gardens it becomes much more luxuriant: there the stalks rise a foot and half high, but never branch; the lower leaves are an inch and half long, and three-quarters of an inch broad.—Native of Europe and Siberia, in dry calcareous pastures, flowering from July to September. Its bright blue flowers agreeably enliven the barren places where it generally grows. It has been observed in several closes, adjoining to Newmarket heath beyond Rottesham; among the furze near Hare Park, about Horseheath Hall, and on the walls of St. John's College, Cambridge; on Cavenham Heath; near Bury, in Suffolk; near Penny-bridge, Lancashire; and about Penzance, in Cornwall.

8. Veronica Hybrida; *Welsh Speedwell.* Spikes terminating; leaves opposite, elliptic, obtuse, unequally crenate, serrate; stem nearly upright. The difference between this and the preceding is not easily defined, and yet they seem to be distinct, though some have thought otherwise.—Found near Cartmel Fells, Lancashire, and in different parts of North Wales.

9. Veronica Pinnata; *Winged-leaved Speedwell.* Spikes terminating; leaves pinnatifid, subfascicled; segments filiform, divaricating. Root perennial; stems diffused, erect; flowers blue, appearing in July.—Native of Siberia.

10. Veronica Laciniata; *Jagged-leaved Speedwell.* Racemes subspiked, terminating; leaves pinnatifid, laciniate. It flowers in June and July.—Native of Siberia.

11. Veronica Incisa; *Cut-leaved Speedwell.* Spikes terminating; leaves lanceolate, gash-pinnatifid, smooth. It flowers in July and August.—Native of Siberia.

12. Veronica Catarractæ. Racemes terminating, flexuose; stem suffruticose; leaves lanceolate, serrate; stem somewhat shrubby.—Native of New Zealand.

13. Veronica Elliptica; *Elliptic-leaved Speedwell.* Racemes lateral; stem shrubby; leaves elliptic, quite entire.—Native of New Zealand.

14. Veronica Macrocarpia; *Long-fruited Speedwell.* Racemes subterminating, erect; leaves lanceolate, quite entire, smooth, flat. Stem shrubby; branches round, smooth, jointed, covered with a brown bark; tube of the corolla twice as long as the calix.—Native of New Zealand.

15. Veronica Salicifolia; *Willow-leaved Speedwell.* Racemes lateral, nodding; leaves lanceolate, quite entire. Stem shrubby; branches round, smooth, jointed, marked with rings after the leaves are fallen, the thickness of a goose-quill.—Native of New Zealand.

16. Veronica Parviflora; *Small-flowered Speedwell.* Racemes subterminating; leaves linear-lanceolate, quite entire, smooth, one to two inches long; stem shrubby; branches round, smooth.—Native of New Zealand.

17. Veronica Officinalis; *Common Speedwell.* Spikes lateral, peduncled; leaves opposite, rugged; stem procumbent. Root perennial, fibrous; stems trailing, branched, forming broad tufts, or scattered patches. The whole plant hairy. Corolla tube half as long as the calix, white; border pale purple, or faint violet, with deeper veins or streaks. The leaves have a weak, not disagreeable smell, and a bitterish taste: they have been much recommended, especially in Germany and Sweden, as a substitute for Tea, than which it is more astringent and less grateful. As a medicine, the Common Speedwell has had a considerable share of fame, particularly in disorders of the lungs, as coughs, asthmas, consumptions, &c. in which it was said not only to prove expectorant, but to heal internal ulcers. The smell of the leaves is dissipated in drying; they give it over, however, in distillation with water, but without yielding any separable oil: they are bitterish and roughish to the taste, and an extract made from them by rectified spirit, is moderately astringent. A decoction of the whole plant is good to remove obstructions. It operates by urine, and consequently is serviceable in the jaundice, and beginning of dropsies. A slight tincture or infusion of it promotes perspiration, and is good in feverish complaints. The juice, boiled into a syrup with honey, is excellent in asthmatic complaints, and other disorders of the lungs; and outwardly applied, is a cure for the itch, and other cutaneous disorders. A strong decoction given as a clyster, with the addition of a little oil, eases those colicky pains which arise from the stone or gravel; an infusion of the leaves, drank constantly in the manner of tea,

is a strengthener, and provocative to venery; and is, by some, ridiculously supposed to be a cure for barrenness. It varies in the colour of the flowers, pale blue, pale red, and white; but what is much more remarkable, it has been found abroad with double flowers.—Native of Europe, on dry sandy pastures and heaths: it is not uncommon in England, flowering from May or June to August.

18. Veronica Allionii; *Shining-leaved Speedwell.* Spikes lateral, peduncled; leaves opposite, roundish, shining, rigid. Stems smooth, creeping; root perennial; creeping; flowers very numerous, violet-coloured.—It is plentiful on the Alps of Switzerland, and also upon the Pyrenees.

19. Veronica Decussata; *Cross-leaved Speedwell.* Racemes axillary, few-flowered; leaves elliptic, perennial, quite entire; stem shrubby. Branchlets alternate, spreading, round, or indistinctly quadrangular; corolla milk-white, with the divisions nearly equal, spreading, and the orifice beardless.—Native of the Falkland Islands. This is a hardy greenhouse plant, and, according to Mr. Curtis, is entitled to our admiration, on account of its large and elegant flowers, and their most delicious fragrance.—It may be placed with the Myrtles; and in mild winters it will even stand secure in the open air, in a warm soil and sheltered situation. It is usually and readily increased by cuttings.

** *Corymb racemed.*

20. Veronica Aphylla; *Naked-stalked Speedwell.* Corymb terminating; scape naked; leaves obovate, crenate, hairy. Stems not longer than a finger, very slender, somewhat villose, leafless, few-flowered; corolla tinged with blue. It varies considerably, and commonly appears as a single tuft of villose rounded leaves; but sometimes with several stems creeping to right and left, forming tufts here and there, and bearing only two or three flowers upon each. There is also a variety of greater size in all the parts.—It flowers in May; and is a native of the southern Alps of Europe, and north of Asia, but has not been observed in Great Britain.

21. Veronica Bellidioides; *Daisy-leaved Speedwell.* Corymb terminating; stem simple, ascending, leaves obtuse, crenate; calices hirsute; spike of pale grayish-blue flowers terminating the stem. The whole of the herbage is more or less hairy. It flowers in June and July.—Native of the Alps of Switzerland, especially about Aigle, Piedmont, Dauphiny, and Silesia.

22. Veronica Gentianoides; *Gentian-leaved Speedwell.* Corymb terminating, hairy; leaves lanceolate, cartilaginous at the edge, the lower connate, sheathing. Root perennial; stem in its wild state about five inches high, but by cultivation rises to two feet, with a lax habit, and long cluster of numerous flowers; corolla large, beautiful, of a deep blue; footstalks hairy.—Found by Tournefort in Cappadocia.

23. Veronica Ponæ; *Pona's Speedwell.* Racemes terminating; stem quite simple; leaves cordate-ovate, toothed, sessile. Root perennial.—Native of the Pyrenees.

24. Veronica Fruticulosa; *Flesh-coloured Shrubby Speedwell.* Corymb terminating, many-flowered, spiked; leaves elliptic-lanceolate; stems erect; capsule ovate, four-valved. In strong woody roots, and stems branching and intricate at their base, this agrees with the following species; but the flowering-branches are perfectly upright, four to six inches in height, each bearing a spike rather than a corymb, composed of a considerable number of flesh-coloured flowers. In both, the flowering branches are merely annuals, though the stem below is woody, and truly perennial, so that the latter ought rather to be esteemed the naked crown of the root.—Native of the mountains of Switzerland, Austria, Piedmont, Dauphiny, and the Pyrenees.

25. Veronica Saxatilis; *Blue Rock Speedwell.* Corymb terminating, few-flowered; leaves elliptic; stems diffused; capsule ovate, four-valved. The root runs deeply into the fissures of rocks, and the woody, branching, entangled stems, form small tufts, whence the simple, leafy, round, downy, flowering branches, three or four inches long, spread in every direction. From three to six large handsome dark blue flowers grow in a short terminating corymb, the pedicels of which are twice or thrice as long as the corresponding bractes. Orifice of the corolla elegantly tinged with red. This beautiful little plant has been long known in curious collections: it is akin to the last species, with which many botanists have confounded it; it differs, however, in the stems being diffused, the leaves shorter and rounder, and the flowers of a rich ultra-marine blue.—Native of Switzerland, Austria, Denmark, Norway, and Scotland; found, in the last, upon Ben Lawers.

26. Veronica Alpina; *Alpine Speedwell.* Corymb terminating, subspiked; leaves ovate, smooth, subserrate; calix ciliate; stem ascending, simple. Root perennial, of long simple fibres; flowers small, in a short dense blunt spike or corymb, afterwards lengthened out into a raceme; corolla bright blue. It flowers in July and August.—Native of the mountains of Europe, from Lapland to Savoy.

27. Veronica Integrifolia; *Entire-leaved Speedwell.* Corymb terminating; leaves opposite, elliptic, obtuse, quite entire; calices hairy; corolla small, blue or white.—Native of the Palatinate, Bohemia, and Silesia.

28. Veronica Serpyllifolia; *Smooth Speedwell,* or *Paul's Betony.* Raceme terminating, subspiked; leaves ovate, subcrenate, three-nerved, smooth; capsule obcordate, shorter than the style. Roots perennial, fibrous, and the prostrate stems throw out numerous radicles, by which the plant is much increased. In wet places the whole herb is very smooth and shining, rather fleshy; but in very dry spots it becomes all over downy.—Native of Europe, Siberia, Barbary, and North America: it is common with us in pastures that are rather moist, sometimes in the shady parts of cultivated grounds, flowering in the early part of summer.

29. Veronica Tenella. Leaves oblong, crenate; stems creeping; calices villose. This is thought to be a variety of the foregoing species.—Native of the Piedmont alps, &c.

30. Veronica Beccabunga; *Broad-leaved Brooklime,* or *Water Speedwell.* Racemes lateral; leaves elliptic, flat; stem creeping. Root perennial; stems procumbent or floating in their lower part, sending out long fibrous radicles from the joints, round, succulent, smooth, and shining; leaves of a rich bright green, from one to two inches long, on short broad stalks; clusters axillary, opposite, erect, longer than the leaves, composed of numerous blue flowers, in perfection about June or July. The leaves are mild and succulent, and may be eaten with water-cresses, as a salad, in the spring: they have a bitterish subastringent taste, but manifest little or no acrimony, nor any peculiar odour. To derive any advantage from it, the juice must be used in large quantities, or the fresh plants eaten as food. The juice of this plant may either be taken alone, or mixed with the juice of water-cress, or any other plant of similar virtues. An infusion of this plant, in boiling water, is diuretic, and serviceable in the jaundice and dropsy. The leaves, bruised and applied to green wounds, soon heal them; and made into a poultice, and applied to the part, they give ease in the piles. It is generally gathered for medical purposes; and, together with Scurvy-grass, is an ingredient in that nauseous composition called Spring juices.—Native of Europe, Siberia, and Barbary, in clear ditches and limpid streams.

31. Veronica Anagallis; *Long-leaved Brooklime*, or *Water Speedwell.* Racemes lateral, opposite; leaves lanceolate, serrate; stem erect. Root perennial, creeping. The whole herb agrees very much with the preceding in habit, and probably in its general qualities; it is, however, taller, more erect, and readily known by its long, acute, lanceolate leaves. —Native of watery situations in Europe, Siberia, Barbary, and North America.

32. Veronica Scutellata; *Narrow-leaved Brooklime*, or *Marsh Speedwell.* Racemes lateral, alternate; pedicels divaricating; leaves linear, toothletted. This is a slender, weak, perennial herb, often of a purplish colour, with long narrow leaves, occasionally downy, and pale flesh-coloured flowers with purple veins.—Native of many parts of Europe and Barbary, in bogs and on the hedges of ponds upon heaths or moors, flowering from June to September; but much less common in England than the two foregoing species.

33. Veronica Teucrium; *Germander Speedwell.* Racemes lateral, very long; leaves ovate, wrinkled, toothed, bluntish; stems ascending, hairy; fifth segment of the calix very minute. Root perennial; stems quite erect, a foot high, round, leafy; flowers copious, rather crowded, large, handsome, of a fine blue.—Native of Germany, Bohemia, &c.

34. Veronica Pilosa; *Hairy Speedwell.* Racemes axillary; leaves ovate, obtuse, plaited, deeply toothed; stem prostrate, hairy, in two rows; calix four-cleft, with the two outer segments bigger.—Native of Austria and Bohemia.

35. Veronica Prostrata; *Trailing Speedwell.* Racemes lateral; leaves oblong, ovate, serrate; stems prostrate; root perennial.—Native of Germany, Italy, and Switzerland.

36. Veronica Pectinata; *Comb-waved Speedwell.* Racemes lateral, leafed; leaves oblong, pectinate, serrate; stems prostrate. Root perennial; flowers lateral, a hand in length. —This species was found in the neighbourhood of Constantinople, on the shores of the Bosphorus.

37. Veronica Montana; *Mountain Speedwell.* Racemes lateral, elongated, filiform, few-flowered; leaves ovate, petioled, serrate. Stem hairy all round; root fibrous, perennial; flowers pale blue, painted with purple.—Native of Germany, Austria, Switzerland, Italy, and Britain. In the last it is found in shady and rather moist woods, particularly on a chalky soil; flowering in May and June. It is found growing copiously in Charlton wood; and has been observed in the woody part of the Devil's Ditch on Newmarket heath; in Hallwood about Linton, and in Gamlingay Park, Cambridgeshire; also at Eversholt, Bedfordshire; in Shotover plantations, Stokenchurch, and Nettlebed woods, near Worcester; at Shortwood, Pucklechurch, Gloucestershire; by the river side under Hodhill, Dorsetshire; about Kirkstall Abbey, near Leeds, and common in other parts of Yorkshire; as well as in the woods at Dunglass near the river, Scotland. See the first species.

38. Veronica Chamædrys; *Germander Speedwell.* Racemes lateral; leaves ovate, sessile, wrinkled, gash-serrate. Stem hairy, in two rows; root perennial, fibrous, a little creeping; flowers as many as twenty in a raceme, on slender pedicels, with a lanceolate bracte at the base of each; they are large, the corolla bright blue, elegantly veined of a deeper blue, pale and somewhat flesh-coloured on the outside; the orifice is white, as are also the base and the point of the filamenta, the pollen, and the base of the style. Few of our wild flowers can vie with this in elegance and brilliancy, and many with far less beauty are sedulously cultivated in our gardens. In May and June every hedge, bank, and grassy bottom, is adorned with it: at night, or in damp weather, the corolla closes, but in dry bright weather is fully expanded; and though each flower is short-lived, there is a copious succession. Dr. Withering thinks the leaves to be a better substitute for Tea than those of the Common Speedwell, because they are more grateful, and less astringent.— Native of grassy pastures, groves, and banks, throughout Europe.

39. Veronica Orientalis; *Oriental Speedwell.* Racemes lateral; leaves pinnatifid, smooth, acute, attenuated at the base; calices unequal; pedicels capillary, longer than the bracte. Stalks declining, with narrow leaves upon them. The flowers are of a pale blue colour, and appear at the end of April.—Native of the Levant.

40. Veronica Multifida; *Multifid-leaved Speedwell.* Racemes lateral; leaves many-parted; segments pinnatifid; lobes decurrent; peduncles short; calix very smooth; stem villose.—Native of Siberia.

41. Veronica Austriaca; *Austrian Speedwell.* Racemes lateral; leaves somewhat hairy, linear, pinnatifid, the lowest segments longer, divaricating; calices somewhat hairy; peduncles longer than the bracte; flowers in long loose axillary spikes, of a bright ble colour, appearing from June to August. —Native of Austria, Carniola, and Silesia.

42. Veronica Taurica; *Tauric Speedwell.* Racemes lateral; leaves somewhat hairy, linear, undivided, and pinnatifid, toothletted; peduncles longer than the bracte; calix four-cleft, smooth; corolla rose-coloured. The stems are decumbent, and not above four inches long.—Native of Tauria, on chalky stony hills.

43. Veronica Urticæfolia; *Nettle-leaved Speedwell.* Racemes lateral; leaves cordate, sessile, sharply serrate, acuminate; stem stiff; calix-leaves four. Root perennial; corolla flesh-coloured. It flowers in June and July.—Native of Switzerland, Bithynia, Austria, and Bavaria.

44. Veronica Latifolia; *Broad-leaved Speedwell.* Racemes lateral; leaves cordate, sessile, wrinkled, bluntly serrate; stem stiff; calix-leaves five. The flowers are large and elegant; the tube is white, but the border of an elegant blue, with deeper stripes. A common hardy perennial in gardens, flowering in June and July.—Native of Austria, Bohemia, Germany, and the Levant, growing in shrubby places, about hedges, and sometimes in meadows.

45. Veronica Paniculata; *Panicled Speedwell.* Racemes lateral, very long; leaves lanceolate, tern-serrate; stem ascending. Stem round, not quite erect; flowers blue.—Native of Tartary and Bohemia.

**** Peduncles one-flowered.*

46. Veronica Biloba; *Two-lobed Speedwell.* Flowers solitary; leaves cordate, lanceolate, toothed; calix-leaves equal, ovate, acuminate, three-nerved. Root fibrous, annual; stems two to four inches long, erect, branched, downy; corolla small, white.—Found in the corn-fields of Cappadocia.

47. Veronica Agrestis; *Procumbent Speedwell.* Flowers solitary; leaves ovate, gash-serrate, shorter than the peduncles; stems procumbent; seeds cupped. Root annual, small, fibrous; stems simple, except at the base, round, leafy, hairy, from six to twelve inches long; flowers deep blue, on simple axillary peduncles, exceeding their corresponding leaves in length, and curved downwards.—Found throughout Europe.

48. Veronica Arvensis; *Wall Speedwell*, or *Speedwell Chickweed.* Flowers solitary; leaves ovate, gash-serrate; floral leaves lanceolate, longer than the peduncle; stem erect. Root annual, fibrous; flowers small, pale blue.—Native of Europe, Barbary, Japan, and North America. In the neighbourhood of Rome it occurs with white flowers. In England it occurs in dry gravelly fields, waste sandy places, dry pastures, and on walls, flowering in May.

49. Veronica Hederifolia; *Ivy-leaved Speedwell*, or *Small Henbit*. Flowers solitary; leaves cordate, flat, five-lobed; calicine segments cordate; seeds cupped. Root annual, small, fibrous; corolla pale blue, shorter than the calix; mouth villose within. This has the greatest affinity to the Agrestis in its habit and place of growth, and in the peculiar formation of its seed-vessels and seeds; in which both totally differ from the other British species.—Native of Europe and Barbary, in gardens and corn-fields; abundant in light soils, flowering in April and May.

50. Veronica Filiformis; *Long-peduncled Speedwell*. Flowers solitary; leaves cordate, crenate, shorter than the peduncle; calix-leaves lanceolate. Root annual; stems filiform, procumbent; flowers axillary, large.—Found in Syria.

51. Veronica Triphyllos; *Trifid-leaved Speedwell*, or *Upright Chickweed*. Flowers solitary; upper leaves digitate; peduncles longer than the calix; seeds flatted. Root annual, fibrous; stem mostly branched; corolla deep blue; seeds numerous, obovate, flat. Its divided leaves, the deep rich blue colour of its flowers, and the largeness of its seed-vessels, distinguish this at once from every other British species.—It is common to most parts of Europe, and chiefly found in corn-fields, where the corn is light: it is of very partial growth in this country, being found principally in the sandy tract which connects Norfolk and Suffolk. It flowers in March and April, and the seeds ripen in June.

52. Veronica Verna; *Vernal Speedwell*. Flowers solitary, subsessile; leaves finger-parted; peduncles shorter than the calix. Stem stiff and straight; calix much longer than the corolla, and deeply divided into four lanceolate blunt unequal segments; corolla blue, with a green base.—Native of dry open sandy fields in many parts of Europe.

53. Veronica Digitata; *Finger-leaved Speedwell*. Flowers solitary, sessile; all the leaves finger-parted; stem stiff and straight; root annual.—Native of the south of France, about Montpellier; and of Spain and Bohemia.

54. Veronica Acinifolia; *Basil-leaved Speedwell*. Flowers peduncled, solitary; leaves ovate, smooth, crenate; stem erect, somewhat hairy.—Native of Germany, Switzerland, and Piedmont.—It flowers in May.

55. Veronica Peregrina; *Knotgrass-leaved Speedwell*. Flowers solitary, sessile; leaves oblong, bluntish, toothed, and entire; stem erect.—Native of the north of Europe, Germany, Dauphiny, and Italy. See the first species.

56. Veronica Bellardi; *Linear-leaved Speedwell*. Flowers solitary, peduncled; leaves linear, quite entire, rough-haired, longer than the flower; stem quite small, erect. The whole plant is hirsute.—Native of the pastures of Piedmont.

Vervain. See *Verbena*.

Vervain, Mallow. See *Malva*.

Vetch. See *Vicia*.

Vetch, Bitter. See *Orobus*.

Vetch, Chickling.
Vetch, Crimson-Grass. } See *Lathyrus*.

Vetch, Hatchet. See *Coronilla*.

Vetch, Horse-shoe. See *Hippocrepis*.

Vetch, Kidney. See *Anthyllis*.

Vetch, Milk. See *Astragalus*.

Vetchling. See *Aphaca*.

Viburnum; a genus of the class Pentandria, order Trigynia.—Generic Character. *Calix:* perianth five-parted, superior, very small, permanent. *Corolla:* one-petalled, bell-shaped, five-cleft; segments blunt, reflexed. *Stamina:* filamenta five, awl-shaped, length of the corolla; antheræ roundish. *Pistil:* germen inferior, roundish, crowned with a turbinate gland; style scarcely any; stigmas three. *Pericarp:* berry roundish, one-celled. *Seeds:* bony, roundish. Essential Character. *Calix:* five-parted, superior. *Corolla:* five-cleft. *Berry:* one-seeded.—This genus is distinguished from *Sambucus*, by having one seed instead of three.——The species are,

1. Viburnum Tinus; *Laurustinus*, or *Laurustine*. Leaves quite entire, ovate; ramifications of the veins villose, glandular. There are several varieties of this species; one has variegated leaves, others gold, and silver stripes. The berries of this plant are very hot, and inflame the fauces violently, like those of Mezereon and Spurge-Laurel; though starlings devour them greedily.—Native of the south of Europe, and of Barbary.—*Propagation, &c.* This with its varieties are propagated by laying down their young branches, which put out roots very freely, so that when they are layed in autumn, they will be well rooted by that time twelvemonth, when they should be taken from the old plants, and may either be planted where they are to remain, or into a nursery for two years to get strength. The best season to transplant them is at Michaelmas, that they may get new root before winter; for as they begin to flower early in winter, they will more surely succeed then than at any other time of the year: but they may be removed in the spring with balls of earth to their roots, provided it is done before they begin to shoot: they may also be removed at the end of July or the beginning of August, if rain should happen at this season; for after they have done shooting, which is soon after Midsummer, they will be in no danger if not kept too long out of the ground. They may also be increased by seeds, which should be mixed with earth in autumn, soon after they are ripe: they should then be exposed to the air, and receive the rain in winter, and in the spring they may be sown upon a gentle hot-bed, which will bring up the plants; they should remain in the bed till autumn, and then may be transplanted, and treated in the same way as the layers. The Laurustinus is sometimes trained up to round heads with naked stems, but these in the open air will be more exposed to suffer from frost than those which have the branches growing rude from the bottom; for if the frost kills the outer part of the shoots, the stems will be protected, and will soon put out new branches, but where the stems are naked the frost frequently kills them to the root. The blossoms of this plant are never destroyed, except in very severe seasons, but smoke is very injurious. The shining-leaved variety is the most ornamental, but at the same time the most tender: it thrives best in sheltered situations and a dry soil.

2. Viburnum Tinoides. Leaves elliptic, smooth, quite entire; branches and cymes round, hirsute. This resembles the preceding species.—Native of South America.

3. Viburnum Villosum; *Hoary Viburnum*. Leaves quite entire, ovate, hoary, and villose beneath. Stem a fathom high, with ash-coloured bark; branches round, hoary; corolla whitish, with roundish spreading segments. It flowers in autumn.—Native of hills in the southern parts of Jamaica.

4. Viburnum Scandens; *Climbing Viburnum*. Shrubby, scandent: leaves oblong-serrate; cymes slender, hairy, of three unequal branches; flowers white. Stem frutescent, branched; branches and branchlets alternate, round, ash-coloured, smooth, climbing; styles three, divaricating; filamenta ten.—Native of Japan.

5. Viburnum Nudum; *Oval-leaved Viburnum*. Leaves oval, somewhat wrinkled, rolled back at the edge, and obscurely crenulate. Stem strong, covered with a brown smooth bark, ten or twelve feet high, sending out woody branches on every side in its whole length. The flowers are produced in large umbels at the ends of the branches, and are like those of the first species in shape and colour, but smaller,

and the stamina much larger than the corolla: they appear in July, and are succeeded by roundish berries, which when ripe are black, but rarely ripen in England.—Native of North America.

6. Viburnum Prunifolium; *Plum-leaved Viburnum.* Leaves obovate, roundish and oval, smooth, sharply serrate; petioles margined. Stalk woody, ten or twelve feet high, covered with a brown bark, and branching its whole length; flowers white, in small umbels, lateral, and terminating; berries dark-blue.—Native of North America.

7. Viburnum Dauricum; *Siberian Viburnum.* Leaves ovate, serrate, dotted, hairy; cymes dichotomous, few-flowered. This is an upright shrub, with slender, jointed, straight, opposite, spreading branches, covered with a whitish-gray bark; corollas yellowish-white; berry globular, large, ovate, depressed.—Native of Russia and Siberia.

8. Viburnum Dentatum; *Tooth-leaved Viburnum.* Leaves ovate, tooth-serrate, plaited. Stalks soft and pithy, branching out greatly from the bottom upward, and covered with a gray bark; flowers in terminating corymbs, white: they appear in June, but are not succeeded by berries in England. There are two varieties of this species; one with the leaves smooth on both sides; the other with the leaves downy underneath, and drawn out to a point.—Native of North America. This is generally propagated by layers. The young shoots take root very freely; as also will the cuttings, if planted in autumn. The seeds, when imported, generally remain a year in the earth.

9. Viburnum Plicatum; *Plaited-leaved Viburnum.* Leaves ovate, obtuse, tooth-serrate, plaited. The flowers are radiated, like our Guelder-rose.—Native of Japan, about Fammamato in Fakona.

10. Viburnum Erosum; *Japanese Viburnum.* Leaves ovate, acuminate, erose, serrate, smooth; petioles tomentose. Stem upright, shrubby; branches opposite, angular, ash-coloured, smooth, from spreading upright; flowers in a decompound umbelled panicle, terminating the branchlets, not radiate; peduncles and pedicels angular, hairy.—Native of Japan.

11. Viburnum Lantana; *Way-faring Tree.* Leaves cordate, serrate, veined, tomentose beneath. This is a thickly branched shrub, or small tree, having round, pliant, mealy twigs, with the same kind of tufted stellated pubescence as is found on the flower-stalks, backs, and even upper surfaces, of the leaves; flowers in large, terminating, solitary, many-flowered cymes; corolla white, cloven half way down, spreading. This is generally supposed to have been the Viburnum of Virgil, though he only contrasts it with the Ball Cypress, and says nothing by which it can be distinguished from shrubs in general. There is a variety in North America with much larger leaves, known by the name of Hobble-bush; and another in our nurseries with variegated leaves, but they become plain when the shrubs are removed into good ground, and grow vigorously. —Native of Europe, except in the most northerly countries. In England, (where the bark of the root is used to make bird-lime,) it is chiefly found in a calcareous soil, among woods and hedges, flowering in May. This may be propagated either from seeds or layers, but the former method is seldom practised, because the seeds rarely grow the first year, and the branches easily put out roots. The best time for laying those branches is in autumn, just as the leaves begin to fall. By the succeeding autumn they will be rooted, and may then be removed into a nursery for two or three years, and then planted where they are to remain: this kind is very hardy. The Striped variety may be propagated by inarching or budding upon the plain sort; but there is no great beauty in it. The American variety is much superior to the European.

12. Viburnum Tomentosum; *Downy Viburnum.* Leaves ovate, acuminate, serrate, veined, tomentose beneath; umbels lateral; branches round, smooth, tinged with red, divaricating, subdivided.—Native of Japan, in woods, flowering in April and May.

13. Viburnum Hirtum; *Rough Viburnum.* Leaves ovate, serrate, villose; petioles rough-haired. Stem flexuose, erect, round, smooth; stigma two-lobed.—Native of Japan.

14. Viburnum Oxycoccus; *Cranberry Guelder Rose.* Leaves three-lobed, acute at the base, three-ribbed; footstalks furnished with glands; cymes radiant. Twigs of a shining red; berries red, of an agreeable acid.—Grows in shady and swampy woods in North America.

15. Viburnum Orientale; *Oriental Viburnum.* Leaves three-lobed, acuminate, grossly and bluntly toothed; petioles smooth, and without glands. This is so nearly allied to the twenty-seventh species, that it can only be distinguished by the leaves being grossly toothed, instead of sharply serrate. —Native of the Levant and of Russia.

16. Viburnum Opulus; *Water Elder*, or *Guelder Rose.* Leaves three-lobed, acuminate, toothed; petioles glandular, smooth. This is a small bushy tree, smooth in all its parts, and very much branched; branches opposite, round; cymes terminating, solitary, compound of many white flowers, radiant; the inner perfect, small, resembling those of Elder; those in the margin abortive, consisting merely of a large irregular flat petal, without any organs of fructification.—The beautiful variety so common in plantations, bearing large round bunches of abortive flowers only, and grouping so elegantly with Lilac and Laburnum in the early part of summer, will rise to the height of eighteen or twenty feet, if permitted to stand; the stem becomes large; the branches grow irregular, and are covered with a gray bark; the leaves are divided into three or four lobes, like those of the Maple; the flowers come out in a large corymb, are very white, and, being all neuters, are barren. From their extreme whiteness, and swelling out into a globular form, some persons call it *Snow-ball Tree*: it is also called *Elder Rose* and *Rose Elder.* There is likewise an American variety, a shrub that has twigs of a shining red colour: it rises eight or ten feet, with many side-branches, covered with a smooth purple bark, and cordate-ovate leaves, deeply serrate, and strongly veined, on long footstalks. —Viburnum Opulus is a native of Europe; and is common in our woods and hedges, and watery places, flowering early in June. The bright red berries ripen about September, and towards the middle of October the leaves assume a beautiful pink colour. This may be increased in the same way as the first species: it loves a soft loamy soil, and requires a sheltered situation. The American variety is easily propagated by layers or cuttings. The other variety sends out plenty of suckers, by which it is frequently increased; but the plants so raised being subject to put out suckers, they are not so good as those which come from layers or cuttings. It requires a moist soil, in which it will make much greater progress, and produce flowers more plentifully, than upon a dry soil.

17. Viburnum Dilatatum; *Spreading Viburnum.* Leaves obovate, acuminate, unequally toothed, villose; stem upright, somewhat angular, ash-coloured, villose; flowers in panicles, not radiate; style simple.—Native of Japan.

18. Viburnum Macrophyllum; *Long-leaved Viburnum.* Leaves obovate, acuminate, toothed, smooth. Stem and branches round; flowers in panicles, not radiate; peduncles and pedicels tomentose.—Native of Japan.

19. Viburnum Cuspidatum. Leaves cuspidate, serrate, villose.—Native of Japan.

20. Viburnum Lentago; *Pear-leaved Viburnum.* Leaves broad-ovate, acuminate, sharply serrate; petioles margined, curled; branches bent or hanging down.—Native of North America, from Canada to Carolina, flowering in July.

21. Viburnum Cassinoides; *Thick-leaved Viburnum.* Leaves lanceolate, even, rolled back at the edge, indistinctly crenate. It flowers in June.—Native of North America.

22. Viburnum Nitidum; *Shining-leaved Viburnum.* Leaves linear-lanceolate, shining above, indistinctly serrate, or entire; branches quadrangular. A low shrub, with small leaves. —Native of North America.

23. Viburnum Lævigatum; *Cassioberry Viburnum.* Leaves lanceolate, even, remotely serrate, quite entire at the base; branches two-edged. Stem twelve or fourteen feet high, sending out branches from the bottom to the top; peduncles axillary, very short, supporting small umbels of white flowers, appearing in July; berries globular, red, or, according to Pursh, black.—Native of South Carolina. It is tender while young, and requires to be sheltered under a common frame in winter, till the plants have obtained good strength, when, if they are planted against a warm wall, they will resist the cold of our ordinary winters very well; but as they are liable to be killed by severe cold, it will be prudent to reserve one or two in pots under shelter during winter. This may also be propagated by laying down the branches, which will take root in one year.

24. Viburnum Pyrifolium. Plant glabrous; leaves ovate, subacute, subserrate; petioles smooth; fruits ovate-oblong; cymes subpedunculate; berries black.—Grows on the banks of rivers in Pennsylvania, New Jersey, &c.

25. Viburnum Obovatum. Plant glabrous; leaves obovate, crenate-dentate, or very entire, obtuse; umbels sessile; fruits ovate-subrotund.—Grows in the shady woods of Carolina and Georgia. There is a variety, named by Pursh, Viburnum Obovatum Punicifolium β, with obovate entire leaves.

26. Viburnum Lantanoides. Petioles and nerves pulverulent-tomentose; leaves large, suborbiculate-cordate, abruptly acuminate, unequally serrate; cymes strictly sessile; fruits ovate, red, but when ripe black.—Grows in shady woods on high mountains from Canada to Virginia. It is known by the name of *Hobble-bush.* See the eleventh species.

27. Viburnum Acerifolium. Branchlets and petioles pilose, eglandulose; leaves subcordate-ovate, or trilobed, acuminate, finely serrated, pubescent underneath; cymes peduncled at great length; berries black.—Grows in rocky mountainous situations, from New England to Carolina.

28. Viburnum Molle. Leaves suborbiculate-cordate, plicate-sulcate, toothed, pubescent underneath; petioles subglandulose; cymes radiate; berries oblong-ovate, red.—Grows in the hedges of Kentucky, near Danville; also in Tennessee and Upper Carolina, flowering in June and July.

Vicia; a genus of the class Diadelphia, order Decandria. —Generic Character. *Calix:* perianth one-leafed, tubular, erect, half five-cleft, acute; upper teeth shorter, converging, all of equal breadth. *Corolla:* papilionaceous; banner oval, with a broad oblong claw, at the tip emarginate with a point, bent back at the sides, with a longitudinal compressed raised line; wings two, oblong, erect, half-cordate, with an oblong claw, shorter than the banner; keel with an oblong two-parted claw, the belly compressed, semiorbicular, shorter than the wings. *Stamina:* filamenta diadelphous, single, and nine-cleft; antheræ erect, roundish, four-grooved. A nectareous gland springs from the receptacle between the compound stamen and the germen, short, acuminate. *Pistil:* germen linear, compressed, long; style filiform, shorter, ascending at an erect angle; stigma obtuse, transversely bearded below the tip. *Pericarp:* legume long, coriaceous, one-celled, two-valved, terminated by a point. *Seeds:* several, roundish. Essential Character. *Stigma:* transversely bearded on the lower side.——The species are,

* *With elongated Peduncles.*

1. Vicia Pisiformis; *Pea Vetch.* Peduncles many-flowered; petioles many-leaved; leaflets ovate, the lower sessile. Root perennial; stem upright, frequently climbing to the height of a man among the bushes; flowers pale-yellowish, all drooping one way, small, striated; legume an inch and a half long, smooth, veiny, of a rusty colour. It is the largest of the European Vetches, flowering here in July and August. —Native of Germany, &c.

2. Vicia Dumetorum; *Great Wood Vetch.* Peduncles many-flowered; leaflets bent back, ovate, mucronate; stipules somewhat toothed. This differs from the preceding in the flowers not being yellow, in the leaflets being longer, and the lowest not adhering to the stem. Root perennial. It flowers in May.—Native of France, Germany, Austria, Switzerland, Piedmont, and Siberia. This, and the three following species, should be sown in autumn, soon after they are ripe, for if kept out of the ground till spring, the seeds often fail, or at least remain in the ground a year before they vegetate; they should be sown in the places where the plants are designed to remain, for they do not bear transplanting well. They grow naturally in woods and thickets of bushes, where their roots are screened from the sun, and their stalks furnished with supports: this points out the places where the seeds should be sown. If three or four seeds be sown upon each patch, it will be sufficient; for if one or two plants appear in each, that will be enough. When they appear, keep them clean from weeds, and permit their stalks to climb upon the neighbouring shrubs; for if they trail upon the ground, they will produce few flowers, and in wet seasons the stalks will rot, and the plants become unsightly. A few of them in large gardens may be set in the borders of wood-walks, or in thickets of shrubs; where, if they be allowed to climb up the branches, they will have a good effect during their continuance in flower.

3. Vicia Sylvatica; *Common Wood Vetch.* Peduncles many-flowered; leaflets elliptic; stipules crescent-shaped, toothed. The perennial root throws out may weak, smooth, grooved, zigzag stems, climbing six or seven feet high, and so much branched as to choke whatever they grow near; corolla rather large; standard and wings whitish, beautifully streaked with blue; keel pale blue. It is the most beautiful climber of this island, both leaves and flowers being extremely elegant. —Native of Sweden, Germany, France, and England; flowering from the end of June through August. It was for a long time supposed to be peculiar to the mountainous parts of Great Britain, but has been found almost all over the kingdom, particularly under Salisbury craigs, and at Cartland rocks; near Lanark, in Scotland; near Caerwent in Monmouthshire; near Hackness; about Greta bridge, and at Malham near Settle in Yorkshire; about Kirby Lonsdale, and Kendal, in Westmoreland; at Orton in Cumberland; and in the woods about Newton Cartmel; also in Urswick woods, climbing up several yards; on the hedges behind Matlock bath, Derbyshire; on the north side of Bredon hill, and in moist places about Clifton-upon-Teme, in Worcestershire; on Shelton bank near Salop; in a hedge going down Stoke hill from Bullbarrow, Dorsetshire; in Smokall wood, near Bath; about Devizes in Wiltshire; in Hullwood and Wood Ditton, near Newmarket; at Sheerhatch wood and Eversholt, in Bedfordshire; at Medley grove, Oxfordshire; and at Merley

wood near Whiteham, in Berks.—See the preceding species for its cultivation.

4. Vicia Cassubica; *Cussubian Vetch.* Peduncles about six-flowered; leaflets ten, ovate, acute; stipules entire. Root woody, creeping; stems trailing, three feet long, their lower part becoming more woody towards autumn, but dying to the root in winter; flowers disposed in short axillary spikes, each generally containing six pale blue flowers, which appear in July, and are succeeded by short smooth pods, like those of Lentils, including three or four round seeds.—Native of Denmark, Germany, Austria, and the south of France.

5. Vicia Cracca; *Tufted Vetch.* Peduncles many-flowered; flowers imbricate; leaflets lanceolate, pubescent; stipules semisagittate, mostly entire. Root perennial, creeping; stems two, three, or four feet high, and even more when climbing upon bushes; branches numerous, short, alternate, from the axils of the upper leaves; the corolla has the standard emarginate, reflexed, without any sharp point in the notch, of a violet or bluish purple colour, striped with veins of a deeper colour; wings closing; keel whitish, marked on each side at the tip with a deep violet spot. Found in thickets, hedges, and fields throughout Europe, as also in North America.—Dr. Plot observes, that this and the third species advance starved or weak cattle above any thing yet known. Mr. Miller also remarks, that this and other perennial Tares have been recommended to be sown in fields, as fodder for cattle; but as their stalks are slender and less succulent than the Common Tares or Vetch, it is doubtful whether they will answer the purposes of cultivation. Their stalks trailing to a great length if they have not support, will be liable to rot by lying upon the ground; and although their roots are perennial, yet as it is late in the spring before they shoot to a height sufficient to cut for use, they do not serve until there is a sufficiency of other green food for cattle.

6. Vicia Onobrychioides; *Saintfoin Vetch.* Peduncles many-flowered; flowers distant; leaflets linear; stipules toothletted at bottom. Stem erect, angular, striated, pubescent; corolla blue.—Native of France, Switzerland, Piedmont, and Mount Atlas.

7. Vicia Nissoliana; *Red-flowered Vetch.* Peduncles many-flowered; leaflets oblong; stipules entire; legumes villose, ovate, oblong. Root annual; stem grooved; flowers very small, and dark purple.—Native of the Levant.

8. Vicia Biennis; *Biennial Vetch.* Peduncles many-flowered; petioles grooved, having about twelve leaflets, which are lanceolate and smooth; root biennial; seeds globular, dirty yellow, spotted with black. This promises to become a useful plant for fodder; the stalks growing to a great length, and being well furnished with leaves, they do not decay in autumn, but continue green through the winter, in defiance of the most severe frost; hence in February and March, when there is often a scarcity of green feed for ewes and lambs, this plant may be of great service.—Native of Siberia. It is propagated by seeds, which may be sown in the spring or autumn; and when the plants come up, they will require no other culture but weeding.

9. Vicia Altissima; *Tall Vetch.* Stipules toothed; leaflets elliptic, truncate, very smooth; flowers racemed; peduncles longer than the petiole; stem scandent, striated; corolla pale blue.—Native of Barbary, in hedges near Arzeau.

10. Vicia Benghalensis; *Bengal Vetch.* Peduncles many-flowered; leaflets quite entire; stipules entire; legumes nearly erect; corollas of a very deep red colour, with the apex of the keel black.—Native of Bengal; and found on the Hieres Islands, off the coast of France.

11. Vicia Atropurpurea; *Dark-purple Vetch.* Leaflets linear-lanceolate; racemes many-flowered, directed one way; calices extremely villose, with bristle-shaped teeth; legumes ovate-oblong, drooping, very hirsute. Stem four-cornered, striated, villose; flowers nodding; corolla smooth, very dark purple at the tip.—Native of Algiers.

12. Vicia Canescens; *Hoary Vetch.* Peduncles many-flowered; upper leaves subcirrhose; stipules semisagittate, entire; leaflets oval-oblong, hoary. Stem herbaceous, erect, a foot high or more, four-cornered, somewhat striated; flowers in loose spikes, all one way, blue: annual.—Native of Mount Libanus.

** *Flowers axillary, subsessile.*

13. Vicia Sativa; *Common Vetch* or *Tare.* Legumes sessile, subbinate, nearly erect; lower leaves retuse; stipules toothed, marked: seeds smooth and even. Stems various in size, weak and procumbent, if the tendrils meet with nothing to cling to, but supporting one another tolerably well, when sown thick enough. A very variable annual plant, more or less pubescent; flowers solitary, or in pairs, subsessile, reddish-purple, of different shades. There are several varieties. In dry soils it has a procumbent stem, sharper leaflets, the flowers mostly solitary, and the stipules spotted but obscurely. It varies also in the colour of the pods; and of the seeds, from black to brown and white. This plant derives its trivial name, *Sativa*, from its long cultivation under the names of Tares and Vetches, provincially called Fitches, for the seed, which are an excellent food for pigeons, and also for green feed for horses, cows, and sheep, particularly for soiling horses; and as a meliorating crop, it is very generally esteemed. Tares are said to produce good milk and butter, only they dry cows when too near maturity, and hence they are best for horses in their advanced state. They are very useful in May, or for keep till Midsummer, at which time, in a dry season, their soils are apt to burn up. Winter Tares are excellent for soiling beasts, and to spare grass; for if bullocks be turned to graze as soon as the grass rises in the spring, they keep the ground so bare, that if a hot season ensue it is burnt up, and the farmer has no resource but to turn them to hay a second time. They begin to flower in May, and from that time stock may be advantageously supported on them, till the flowers fall off, and the pods begin to form; then all that are left may be made into hay, or remain to seed. Upon dunged land, with good seed, there will probably be twelve tons of green food per acre, which in favourable seasons will make three tons of excellent hay. But in wet or uncertain seasons it is far better to use the whole crop green, for by so doing the stock will be taken off the grass-land long enough to allow of its being mown for hay; and by the time the cattle have consumed the green Tares, the after-grass will be ready for consumption. Spring Tares produce a lighter crop, and are subject to some rise from a dry summer, but coming a fortnight later, they will make a succession of green food all the summer. The most advisable method of giving them to cattle, is to mow the Tares of the first half acre, and to carry the produce into the stables, cow-houses, and fold yards, or on to poor land, to be there consumed by the stock; then to hurdle off the growing Tares from such cleared ground, into which put the stock, feeding them in racks, and removing the hurdles with the racks daily, to the edge of the growing Tares; by which the land will be manured uniformly, and all the urine deposited in the soil. Or, they may be fed through rack hurdles, made the same with the common ones, only leaving the middle rail out, and nailing upright pieces across, at proper distances to admit the heads of the animals. After a swathe has been mown in the

direction in which the land is to be ploughed, a sufficient number of these hurdles, allowing one to five sheep, are set close to it; at noon the shepherd mows another swathe, throwing it to the hurdles, and the same at night: next morning, a swathe being first mown, the hurdles are again set; and thus by mowing them once in the twenty-four hours, the Tares will be eaten off clean, and the land equally benefited. Many farmers in Middlesex, especially near London, grow a few acres of Tares, for soiling horses and feeding milch cows, and the culture of them has been extended every year, since their importance has been understood. They may be made the principal means of enabling the arable farmer to support as much live-stock as the grazier. During the time they occupy the ground, they produce more green food of the best quality, than the finest pastures, and the ground may be cleared of them in the month of June, in such time as to admit of loamy sands producing a crop of clean Turnips in the same year, and of clayey loams being prepared for and sown with wheat. They support cattle well, and will make both sheep and bullocks, of every size and breed, fat; they suit every situation; and flourish on all sorts of soils. They do not depend on a market, and, above all, they manure the land fit for the immediate reception of Turnips; whereby a succession of green crops can be kept up, that would fat a very increased quantity of live stock, and be the means of raising, in situations the most distant from towns, an abundance of dung. A judicious combination of Tares with Turnips, Clover, and Saintfoin, may be the means of rendering poor sheep-walks, downs, and wastes, of from ten to thirty times their present value to the community.—*Propagation and Culture.* If cultivated for seed, it should be sown in rows at four feet distance, and should be dropped thin in the rows; for as the stalks send out branches extending to a great length, so when the plants are too close, the branches will intermix, and mat so closely together as to rot each other, by excluding the air. Weed them when they come up, which should be performed with Dutch hoes, but afterwards with hoeing-ploughs, which will save expense, and serve to earth the plants in the same way as Pease and Beans, which will greatly strengthen their stalks, and make them and the leaves larger and more succulent, increasing the quantity of the seed. If this practice be continued as often as it may be found necessary to destroy the weeds in summer, it will prepare the ground for any other crop; and as this will be in no hazard of suffering from frost, it should be preserved till the spring, when it is wanted for green feed; though a part of the plants should be left for seed, because those which are cut, if they do shoot again, will flower so late in the summer, that unless the autumn proves very warm, the seeds will not ripen; therefore it will be a better way to sow a sufficient quantity of seeds for this purpose, in a separate spot of ground, because when the other is cut, the ground may be ploughed for other crops; and if in mild seasons there may be so great plenty of other green feed as not to want this, if the plants be ploughed into the ground it will be a good dressing for other crops. Vetches are generally sown at two seasons, one is in autumn, and the other early in the spring; but the best time is in August, for the seeds which are sown then will come up soon, and the plants will have time to get strength before winter, so they will be in less danger of suffering by frost than those which are sown later, and will be fit to cut for feed much earlier in the spring, when green feed is most wanted; and if they be designed for seed, and not to be cut for fodder, those early sown will come soon into flower, and ripen seeds early; hence they may be cut and stacked in good weather, which is a great advantage, for those which ripen late are often stacked or housed wet, and then the seeds sprout in the mow, and are spoiled. The usual method of sowing them is in broad-cast, ploughing them lightly in; in this way the common allowance of seeds, for one acre of land, is two bushels, but some sow two and a half, which may do well enough for such as are designed to be cut for fodder in the spring, but those sown for seeds should be sown in drills like Pease; in which case less than half the quantity of seeds will be sufficient, as the drills should be at least three feet apart, that the hoe-plough may have room to go between them to destroy the weeds, and earth up the plants; for by this management they will produce a much greater crop, and ripen earlier in the season. The drills should be about the same depth as those usually made for Pease, and the seeds scattered about the same distance in the drills. They should be carefully covered as soon as sown, or the rooks will discover and speedily devour them. On this account, those sown early in autumn will be less exposed than those sown late, or in the spring, because there is more food for rooks and pigeons in the open fields at this season. The best time to sow them is about the beginning of August, when the rains will soon bring them forward. Towards the latter end of October the plants will have acquired considerable strength, and should be earthed up with the hoeing-plough in dry weather, in doing which, observe to lay the earth up as high as possible to the stems of the plants, so as not to cover their tops, which will secure them against frost. The whole space of ground between the rows should also be stirred, in order to destroy the weeds; which, if carefully performed in dry weather, will lay the land clean till March; at which time the crop should be earthed a second time, and the ground cleaned again between the rows, which will cause the plants to grow vigorously, and in a little time they will spread so as to meet, and cover the spaces; whereas those sown in the spring will not grow to half this size, and will be very late in flowering. Some persons plough these plants into the ground after they are fully grown, in order to manure the soil. Where this is intended, there will be no necessity to place them in drills, as above directed; but it will in this case be the best method to sow them in autumn, because they will be fit to plough in much sooner the following year, so that the land may be better prepared to receive the crops for which it is intended. In some parts of France, and in Italy, they are grown for feeding cattle while green, as in many parts of England they are cultivated to feed cart-horses; though upon such land as Lucern will thrive in, that would better answer the same purpose. The plants suffered to stand for seed should be cut soon after the pods change brown; and when they are dry, they must be immediately stacked, for if they are suffered to lie out in the field to receive wet, and there comes one hot day after it, the pods will most of them burst and cast out the seeds. When the seeds have been threshed out, the haulm is esteemed very good food for cattle, and some have recommended the seeds for horses, asserting that they are as proper for those animals as Beans; which, if true, will render them more valuable, because they will grow on the lightest sandy land, where Beans will not thrive, and may be very desirable in some parts where the cultivation of Beans is not attempted. On the south downs in Sussex, they substitute a double crop of Tares, instead of a fallow of Wheat. They sow forward Winter Tares, which are fed off late in the spring with ewes and lambs; they then plough and sow Summer Tares and Rape, two bushels and a half of the first, and half a gallon of the second; this they feed off with their lambs, in time to

plough once for Wheat. Thus the land in the fallow year is made to support the utmost possible quantity of sheep; the two ploughings are given at the best seasons; in autumn, for the frost to mellow the lands, and prepare it for a successive growth of weeds; and late in spring, to turn them down: between the times of giving these stirrings, the land is covered with crops; the quantity of live stock supported yields amply in manure; and the treading which the soil receives previous to the sowing of Wheat, gives an adhesion grateful to that plant.

14. Vicia Lathyroides; *Little Spring Vetch.* Legumes sessile, solitary, erect, smooth; leaflets six, the lower ones obcordate; seeds cubic, warty. Stems procumbent, divaricating, numerous; flowers subsessile, solitary, small, bluish-purple. It is very distinct from the varieties of the preceding species, by its smooth even pods, tubercled seeds, simple tendrils, commonly very short, and in a manner abortive, with not more than six leaflets; root small, fibrous, annual, ornamented with garnet-coloured tubercles.—Native of France, Norway, the Levant, and Great Britain. With us it is found on dry grassy banks, and in fallow fields, on a gravelly soil, flowering early in May, and scarcely to be met with after the month of June. Observed in chalky banks near Greenhithe in Kent; about Norwich; in the dry parts of Hyde Park; and in King's Park, Edinburgh.

15. Vicia Lutea; *Rough-podded Yellow Vetch.* Legumes sessile, reflexed, hairy, solitary, five-seeded; banner of the corolla smooth. Root perennial, long, divided at the top among the loose pebbles; where it grows into several diffuse, angular, smooth, striated, subflexuose, leafy stems, often two or three feet long, but little branched. Some of the branches are always subterraneous, producing colourless condensed *gemmæ* rather than flowers, which nevertheless form seeds, as in *Lathyrus Amphicarpa*, and some other Vetches. Flowers solitary, almost sessile; calix tubular; corolla pale yellow, but generally more or less streaked, and stained with a bluish gray or purple, very rarely all over gray; seeds five or six, roundish, smooth, in a young state bitter and astringent.—Found on the beach at Orford, and since at Aldborough in Suffolk; at Weymouth; and in a chalkpit on the side of Glastonbury Tor Hill; in several parts of Europe, the Levant, and near Algiers.

16. Vicia Hybrida; *Hairy-flowered Yellow Vetch.* Legumes sessile, solitary, reflexed, hairy; banner villose; leaflets emarginate. Root perennial; plant generally taller and more upright than the preceding, which it otherwise very nearly resembles in habit and leading characters. The flowers are generally yellow or lemon-coloured, streaked a little with pale purplish red, not varying to gray or purple; they are essentially characterized by the back of their standard being hairy, as well as red at the base.—Native of France, Piedmont, and Barbary. Found also in Great Britain, about Glastonbury, flowering in June.

17. Vicia Lævigata; *Smooth-podded Sea Vetch.* Legumes sessile, solitary, reflexed, smooth; stem nearly upright; leaves very smooth. Root perennial; flowers like those of the fifteenth species, but their calix teeth are generally more equal in length. The corolla is for the most part less yellow, and sometimes quite blue, but both are extremely variable in that respect.—Found on the beach near Weymouth.

18. Vicia Peregrina; *Broad-podded Vetch.* Legumes subsessile, pendulous, smooth, four-seeded; leaflets linear, emarginate. Stems slender and weak; root annual; flowers solitary, large, of a dusky violet colour, with the standard deeply notched. It flowers in July.—Native of France and Piedmont.

19. Vicia Sepium; *Bush Vetch.* Legumes pedicelled, mostly four together, erect, smooth; leaflets ovate, obtuse, the outer ones smaller. Stems climbing by tendrils, two feet high, grooved, little branched; flowers commonly in fours, on very short pedicels all directed one way, dark blue purple. This shoots earlier in the spring than any plant eaten by cattle, vegetates late in the autumn, and continues green all winter. But it is difficult to collect the seeds, as the pods burst and scatter them about; and, moreover, hardly a third part of them will vegetate, being made the nidus of an insect. Though it is palatable to all kinds of cattle, it cannot be cultivated on a large scale, for the reasons above stated.—Native of Europe, in woods, hedges, and bushy pastures, flowering in May and June.

20. Vicia Bithynica; *Rough-podded Purple Vetch.* Legumes peduncled, solitary, erect, rugged; leaflets two-paired, elliptic-lanceolate; stipules toothed. Stems several, climbing by tendrils, branched, angular, grooved, smooth; flowers solitary, peduncled; the peduncles various in length, very seldom two-flowered; standard of the corolla large, of a leaden purple colour; wings and keel whitish.—Native of the county of Nice, Italy, Bavaria, and England. It flowers in July and August; and has been observed in the woods near Clifton-upon-Teme, Worcestershire; in the isle of Purbeck; in Portland island, half a mile to the left of the Ferry, upon loose sand-banks; and in a field half way between the Ferry and Weymouth, near the sea.

21. Vicia Narbonensis; *Broad-leaved Vetch.* Legumes subsessile, about three together, erect; leaflets six, subovate; stipules toothletted; stem erect, angular, striated; root annual. It flowers in June.—Native of France; and of Barbary, near Algiers.

22. Vicia Faba; *Common Garden Bean.* Stem upright; petioles without tendrils; root annual; flowers several together in the axils, white, with a black silken spot in the middle of the wings. Said to have been originally brought from Egypt: it has however been cultivated from time immemorial in all parts of Europe, and even in China and Japan. The most valuable varieties are the following: The first and best sort of early Beans are brought from a Portuguese settlement on the coast of Africa, just without the straits of Gibraltar; it is called the Mazagan Bean. The seeds of this sort are smaller than those of the Horse Bean, and there is too often a great number of bad seeds among them. If it be sown in October, under a warm hedge, pale, or wall, and carefully earthed up when the plants are advanced, they will be fit for the table by the middle of May. The stems are very slender; if therefore they be supported by strings close to the hedge or pale, it will preserve them from the morning frosts, which are sometimes severe in the spring, and retard their growth; and by keeping them close to the fence, it will cause them to come forward better than if that were neglected. They bear plentifully, but ripen nearly together; hence there are never more than two gatherings from the same plants. If the seeds of this sort be saved two years in England, the Beans will become much larger, and not ripen so soon, which is a symptom of degeneracy. The Early Lisbon Bean is the preceding sort saved in Portugal; but is not so well tasted, and should never be preferred, though the gardeners generally plant it for their first crop. The Small Spanish Bean is better than this; and that called the Broad Spanish, which is a little later than the other, but comes in before the common sort, and, being a good bearer, is frequently planted. It is succeeded by the Sandwich, which is almost as large as the Windsor Bean, but being hardier, is generally sown a month sooner: it is a plentiful bearer, but not very delicate

eating. About the same time as the Sandwich, comes the Toker, which is a coarse kind, though much planted, because it is a great bearer. The White and the Black Blossoms are much esteemed by some persons. The former when boiled are almost as green as peas, and being tolerably sweet, are more valuable; but both are very apt to degenerate, unless their seeds are preserved with great care. The White-blossomed Bean is an anomaly, as to the flowers, having none of the black marks on their wings: the seed is semitransparent, and having less of the peculiar Bean flavour when young than any of the others, is on that account much esteemed. The Windsor sort is allowed to be the best for the table, and when planted on a good soil with sufficient room, the seeds will be very large, and in great plenty; and when they are gathered young, they are the sweetest and best-tasted of all the sorts; but should be carefully preserved by pulling out such of the plants as are not perfectly formed, and afterwards by sorting out all the good from the bad Beans. It is seldom planted before Christmas, because it will not bear the frost so well as many of the other sorts; it is therefore generally planted for the great crop to come in June and July. The Long-podded Bean, is a yard or more in height, and a great bearer. There are several subordinate varieties of this kind; as, the Early Tall Turkey, &c. The Dwarf Fan, or Cluster Bean, is chiefly planted for curiosity; the branches spread like a fan, and the flowers are succeeded by small pods, both in clusters.—*Propagation and Culture.* All the early Beans are generally planted on warm borders under walls, pales, and hedges; those which are designed to come up first, being usually planted in a single row pretty close to the fence. Those which are planted early in October, will come up by the beginning of November; and as soon as they are an inch above ground, the earth must be carefully drawn up to their stems with a hoe: this must be several times repeated as they advance in height, which will protect them from the frost, and encourage their strength. In severe winters cover them with peas-haulm, fern, or similar light covering, which will secure them from the injury of the frost; but constantly take off the covering in mild weather, otherwise they will draw up tall and weak, and come to little; and if the surface of the border be covered with tanners' bark, that will defend the roots from frost, and other injuries. In the spring, when they are four feet high, they should be fastened up to the hedge with packthread or a small line, so as to draw them as close as possible, to secure them from the morning frosts, which in March and April are often severe enough to lay down flat upon the ground all the Beans where this precaution has not been taken; which greatly retards their growth, preventing their coming early; and when the blossoms begin to open toward the bottom of the stalks, the top of the stems should be pinched off, which will cause those first pods to stand, and thereby bring them forward. If these rules be observed, and the ground well weeded, there will be little danger of their failing. But lest this first crop should be destroyed by frost, it will be absolutely necessary to plant more about three weeks after the first, and so to repeat planting more every three weeks or a month, till February; but those which are planted toward the end of November, or the beginning of December, may be planted on sloping banks, at a small distance from the hedges; for if the weather be mild they will not appear above ground before Christmas, and hence not so much exposed as the first and second planting, especially where the surface of the soil is covered with tan. The directions above given will be sufficient for these, only it must be observed, that the larger Beans should be planted at a greater distance than the small ones, and that those which are first planted must be put closer together, to allow for some miscarryings; therefore when a single row is planted, the Beans may be put two inches asunder, and those of the third and fourth planting three inches, and when they are planted in rows across a bank, the rows must be two feet and a half asunder, except Windsor Beans, which require a foot more space between the rows, and in the rows five or six inches asunder. In the management of these later crops of Beans, the principal care should be to keep them clean from weeds, and any other plants which would draw away their nourishment; to keep earthing them up, and, when they are in blossom, to pinch off their tops, which, if suffered to grow, will draw the nourishment from the lower blossoms, which will prevent the pods from setting, and so only the upper part of the stems will be fruitful: and another thing should be observed in planting of the succeeding crops, which is, to plant them on moist strong land, as they seldom succeed on dry ground. These after-crops should be planted at about a fortnight's distance from each other, from the middle of February to the middle of May, after which it is generally too late, unless the land be very strong and moist; for in warm dry light land all the late crops of Beans are generally attacked by the black insects, which cover all the upper part of their stems, and soon cause them to decay.—Beans may be *transplanted* with as much safety and success as the Cabbage, or any other vegetable. The advantages attending this mode of practice are important, as a full crop is immediately insured; the crop comes earlier; and the Beans are rendered more prolific, especially in a wet season. The Beans must be sown plentifully in a broad drill, under a wall, some weeks previous to their being planted out.—Where it is intended to save the seeds, a certain quantity should be reserved for that purpose, according to the quantity required. They should be managed in the same way as those which are designed for the table; but none of them should be gathered, because the first are always the finest Beans, which it is advantageous to keep for seed. Those who wish to preserve the several varieties as pure as possible, should never suffer two of the varieties to grow for seeds in the same place; for by their farina mixing, they will be liable to vary. In order to keep the early kinds perfect, those which come the earliest should be saved for seeds, as directed for the others. When the seed is ripe, the stalks should be pulled up, and set upright against a hedge to dry, observing to turn them every third day, that they may dry equally; then they may be threshed out, and cleaned for use, or otherwise stacked up in a barn till there is more leisure for threshing them out; and afterwards the seed should be drawn over, to take out all those which are not fair, preserving the best for use or sale. It is a very good method to change the seed of all kinds of Beans, and not to sow and save the seeds long in the same ground, for they do not succeed well; therefore, if the land be strong where they are to be planted, it will be best to procure the seeds from a lighter ground, (and *vice versâ*,) for by this method the crops will be larger, and the Beans fairer, and not so liable to degenerate.—*Propagation of Field or Horse Beans.* The Horse Bean is known by its small pod and roundish seeds: it appears to be the common parent of all the varieties. In Kent, some of the Garden Beans are taken into field culture, as the Toker, Windsor, Long-pod, Spanish, or Lisbon, and Mazagan; besides others, cultivated only in small quantities for supplying the London seedsmen. There are two or three varieties of the Field Bean, which differ in size and colour; but the Tick Bean, that which is now in the greatest

esteem, does not grow so high as the rest, is a more plentiful bearer, and succeeds better on light land than the Common Horse Bean. Of this again there are several subordinate varieties, as Flat Ticks or Ray-Beans, Small or Essex Ticks, and French Ticks. They delight in a strong moist soil, and an open exposure, for they never thrive well on dry warm land, or in small enclosures, where they are very subject to blight, and are often attacked by black insects, called, by the farmers, black dolphins, which often entirely cover the stems of the plant, especially all the upper part, in which case the Beans seldom come to good; but this rarely happens in the open fields, where the soil is strong. These Beans are generally sown upon land which is fresh broken up, because they are useful to break and pulverize the ground, as well as to destroy the weeds: hence the land is rendered much better for corn after a crop of Beans, than it would have been before, especially if they are sown and managed according to the improved husbandry, with a drill-plough, and the horse-hoe used to stir the ground between the rows of Beans, which will prevent the growth of the weeds, and pulverize the ground, whereby a much greater crop may with more certainty be effected, and the land will be better prepared for whatever crop may be afterwards required. The season for sowing these Beans is from the middle of February to the end of March, according to the nature of the soil; the strongest and wet land should always be last sown: the usual quantity allowed to an acre of land is about three bushels, but this is nearly double the quantity necessary. The old method is that of sowing after the plough in the bottom of the furrows, which in that case should not be more than five or six inches deep. If the land be newly broken up, it is usual to plough it early in autumn, and let it lie in ridges till after Christmas; then plough it in small furrows, and lay the ground smooth; these two ploughings will break the ground fine enough for Beans, and the third ploughing is to sow the Beans, when the furrows should be made shallow, as before-mentioned. Most persons set their Beans too close; for as some lay them in the furrows after the plough, and others lay them before the plough, and plough them in, so by both methods the Beans are set as close as the furrows are made, which is much too near; for when they are on strong good land, they are generally drawn up to a very great height, and are less apt to pod than when they have more room, and are of a lower growth: hence it appears better to make the furrows two feet and a half asunder, or more; which will cause them to branch out into many stalks, and bear a greater plenty than when they are closer; by this method half the quantity of Beans will be sufficient for an acre of land. In the modern method, the ground should be four times ploughed before the Beans are set, which will break the clods, and render the soil much better for planting; then with a drill-plough, to which a hopper is fixed for setting the Beans, the drills should be made three feet asunder, and the spring of the hopper set so as to scatter the Beans at three inches' distance in the drills. By this method less than one bushel of seed will plant an acre of land. When the Beans are up, if the ground be stirred between the rows with a horse-plough, it will destroy all the young weeds; and when the plants are advanced about three or four inches high, the ground should be again ploughed between the rows, and the earth laid up to the Beans; and if a third ploughing be given at about five or six weeks after, the ground will be kept clean from weeds, and the Beans will stalk out, and produce a much greater crop than in the common way. When the Beans are ripe, they are reaped with a hook, as is usually practised with Peas; and after having lain a few days on the ground, they are turned; and this must be repeated several times, until they are dry enough to stack: but the best method is, to tie them in small bundles, and set them upright; for then they will not be in so much danger to suffer by wet, as when they lie on the ground; and they will also be handier to carry and stack than when loose. The common produce is from twenty to twenty-five bushels per acre. The Beans should lie in the mow, to sweat before they are threshed out; for as the haulm is very large and succulent, so it is apt to give, and grow moist; but if they be stacked tolerably dry, there is no danger of the Beans receiving damage, because the pods will preserve them from injury, and they will be much easier to thresh after they have sweated in the mow than before; and after they have once sweated, and are dry again, they never give afterwards. By the modern method, the produce has exceeded the old by more than ten bushels on an acre; and if the Beans which are cultivated in the common method be observed, it will be found that more than half their stems have no Beans on them; whereas, in the improved method, they bear almost to the ground; and as the joints of the stems are shorter, so the Beans grow closer in the stalks. Another method is, whatever the preceding crop may have been, whether corn or old grass, to plough but once for planting Beans, and let it be done as soon as the Christmas frost breaks up. Provide boards of slit deal planed, ten feet long, an inch thick, and two inches broad; bore holes through them at sixteen inches asunder: pass packthreads through these holes, to the length of the lands you are about to plant, and fix a pole at every fifty yards. Place also four stakes at the corner of the extreme poles; fasten them to the ground to keep the lines every where at equal distances, and straight, to facilitate horse-hoeing. Women then take the Beans in their aprons, and, with a dibbler pointed with iron, make holes along the strings with their right hands, putting in the Beans with their left: while they are performing this at one set of lines, another should be in preparation. By the time that the cold easterly winds come on in the spring, they will be high enough to hand-hoe, if they were early planted; and it is of consequence, on strong soils, to seize every dry season for such operations. The hoes should be eight inches wide, the whole surface between the rows carefully cut, and every weed eradicated. When they are six inches in height, they should be horse-hoed with a shim of ten or eleven inches wide at the cutting part. This tool is cheap and simple, not apt to be out of order: it is drawn by one horse, which should be led by a careful person, another holding the shim, and guiding it carefully in the centre between the rows. It effectually cuts up all weeds, and loosens the earth two or three inches deep; in a little time after this operation, the hand-hoe should be sent in again, to cut up what the shim may have passed, and to extract the weeds that grow too near the Beans. If the weather be dry enough, a second horse-hoeing with the shim should follow when the Beans are nine or ten inches high; but in wet weather it must be omitted, and the hand-hoe employed to remove the weeds.

23. Vicia Serratifolia; *Saw-leaved Vetch.* Stem upright; petioles without tendrils; leaflets serrate; root annual, whitish, branched, and, like those of its congeners, furnished with tubercles. The flowers three or four, of a moderate size, and violet-purple; legume compressed, with seven or eight globular seeds. It flowers in June.—Native of the Hungarian mountains.

24. Vicia Biflora; *Two-flowered Vetch.* Leaflets linear; peduncles two-flowered, axillary. Stem angular, slender,

procumbent; corolla blue. A hardy annual.—Native of Algiers.

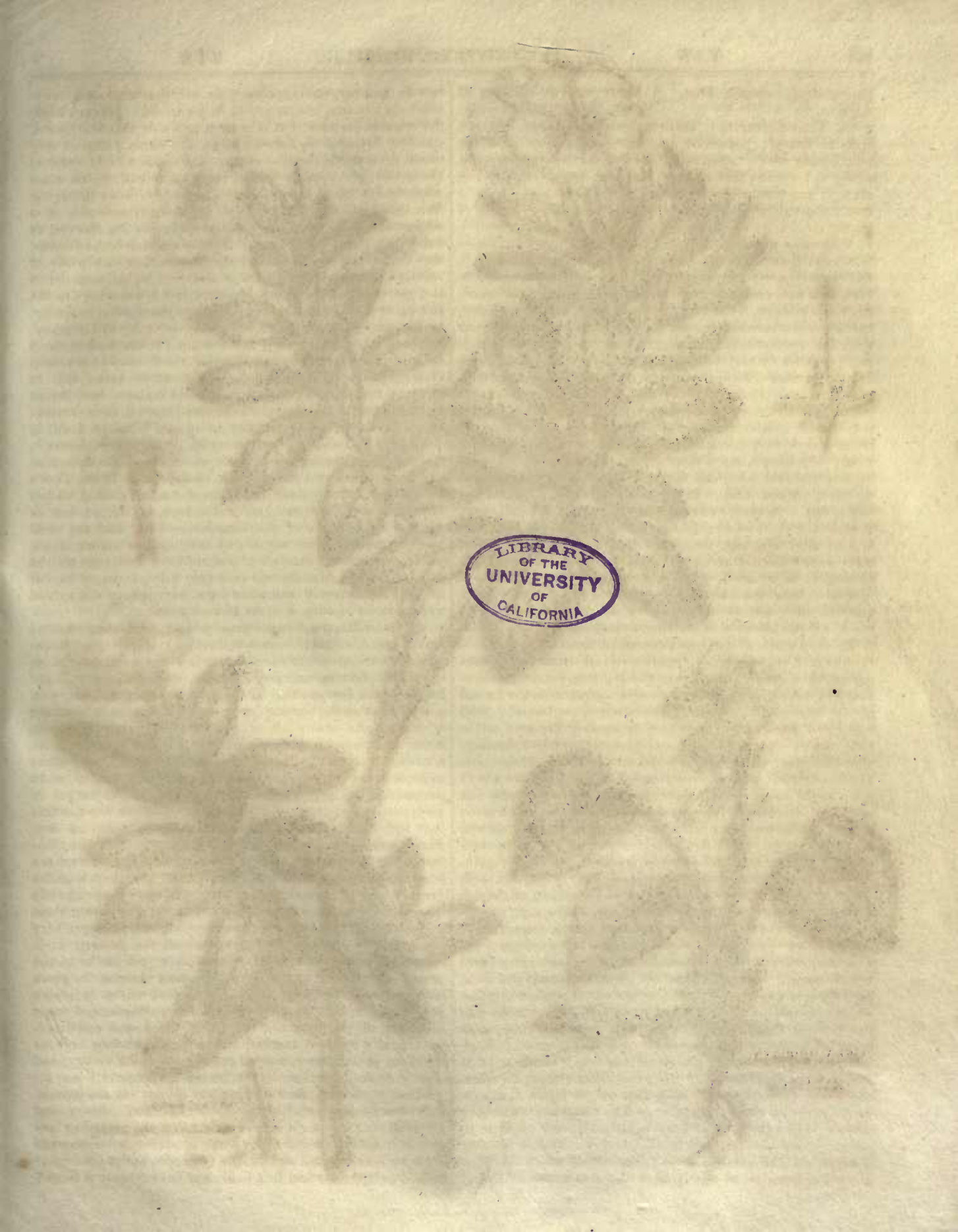
25. Vicia Calcarata. Leaflets linear-lanceolate, obtuse; stipules forked; peduncles one-flowered, shorter than the leaf, having a short spur below the flower; legumes smooth, drooping; corolla pale blue, or red, with bluish veins. The stem is angular, decumbent, and two feet long. It is a hardy annual, flowering in July and August.—Native of Barbary.

Villaria; a genus of the class Diœcia, order Pentandria.—Generic Character. *Male. Calix:* perianth one-leafed, five-parted, spreading, permanent; segments roundish, obtuse, concave, coriaceous, thinner at the edge, almost equal, too more interior. *Corolla:* petals five, oblong, obtuse, flat, spreading, coriaceous, thinner at the edge, twice as long as the calix, permanent. *Stamina:* filamenta five, awl-shaped, erect, smaller by half than the calix; antheræ roundish, twin. *Pistil:* germen orbicular, depressed; style very short; stigmas capitate. *Female. Calix* and *Corolla:* as in the male; nectary leaflets five, ovate, obtuse, erect, alternate with the petals, and shorter, permanent. *Pistil:* germen ovate, turbinate; style very short, scarcely any; stigma capitate, subtrifid. *Pericarp:* berry subglobular, pointed, with the permanent style three-celled. *Seeds:* solitary. Essential Character. *Male. Calix:* in five deep segments. *Corolla:* of five petals. *Nectary:* none. *Germen:* orbicular, imperfect. *Female. Calix* and *Petals:* like the male. *Nectary:* of five leaves, alternate with the petals. *Style:* one. *Berry:* of three cells. *Seeds:* solitary.—This genus has not yet been accurately ascertained. It consists of such species of *Menyanthes* as have the corolla only partially covered with hairs, and the margin of whose segments is thin and inflexed in the bud: the leaves also are simple, and not ternate.

Vinca; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, five-parted, erect, acute, permanent. *Corolla:* one-petalled, salver-shaped; tube longer than the calix, cylindric below, wider above, marked with five lines, the mouth a pentagon; border horizontal, five-parted; segments fastened to the apex of the tube, wider outwards, and obliquely truncate. *Stamina:* filamenta five, very short, inflexed and retroflexed; antheræ membranaceous, obtuse, erect, curved in, fariniferous on both sides at the edge. *Pistil:* germina two, roundish, with two roundish little bodies lying by their sides; style one, common to both, cylindric, length of the stamina; stigma capitate, concave, placed on a flat ring. *Pericarp:* follicles two, round, long, acuminate, erect, one-valved, opening longitudinally. *Seeds:* numerous, oblong, cylindric, grooved, naked. Essential Character. *Corolla:* one petalled, contorted. *Follicles:* two, erect. *Seeds:* naked.——The species are,

1. Vinca Minor; *Small Periwinkle.* Stems procumbent; leaves elliptic-lanceolate, smooth at the edge; flowers peduncled; calix-teeth lanceolate. Root erennial, creeping, with branched fibres. The whole plant is smooth and shining; flowers axillary, alternate, solitary; corolla blue, with a white eye, varying to purple and white. Whoever looks into the tube of this flower with any degree of attention, must be struck with the wisdom displayed in its formation. Each anthera is terminated by a membrane which bends over at top, and the membranes of all the antheræ closing together, effectually seclude every thing that might injure the subjacent parts of the fructification. The filamenta are shaped somewhat like the note of interrogation (?); the antheræ in structure are very similar to those of the Violet, opening inwardly in the same manner; the style, which in most flowers is broadest at top, is here the slenderest; they are two in number, but so closely united, that without a magnifier the division is scarcely to be perceived. Linneus says, the stigmas are two; but it is most probable that the lowest, which is flat, with a glutinous edge, and forms a kind of ring round the style, is the true stigma: the top is a little elevated above this, and appears like a round white ball, which when magnified is found to consist of a number of hairs diverging from one centre, and affords a very pleasing spectacle in a microscope. It varies much in the colour of its flowers, as pale blue, purple, and white: the flowers also occur double, and the foliage is sometimes variegated, either with white or yellow stripes. At the foot of a sheltered hedge, exposed to the morning sun, it flourishes very much, especially if the soil be moist; the flowers are there very ornamental in spring, and continue a month or six weeks.—Native of Germany, Switzerland, France, Italy, and Britain. It has been noticed in Lordship Lane, near Dulwich, on the west of Hampstead Heath; in great abundance going from Primrose Hill to Hampstead, in a lane between the Common and Hayes church; and plentifully below Inglewell church, near Gravesend; also a mile beyond Bexley on the Dartford road, in Kent; by the side of the paling of Mistley park; between Milton, near Swanscomb, and Knockhill; and at the bottom of a lane leading from Eltham to Southend, in the Foot's Cray Road, Essex; about two miles and a half from Croydon on the way to Coombe, and at Cobham, in Surry; and in various other parts of the kingdom.—This, and the next species, are easily propagated by their trailing stalks, which put out roots very freely: if the stalks of the large sort be laid in the ground, they will root very soon, and may be cut off, and transplanted, and when once rooted, they will spread and multiply rapidly, without further attention.

2. Vinca Major; *Great Periwinkle.* Stems nearly erect; leaves ovate, ciliate; flowers peduncled; calix-teeth bristle-shaped, elongated. This is larger than the preceding in all its parts; flowers solitary, alternate, on peduncles half the length of the leaves: they are large, and of a pale blue, with a whitish mouth, varying to white. It has been doubted whether these plants are really wild in England; they probably escaped originally out of gardens, and increasing so readily, have gradually diffused themselves. They delight to grow under the cover of trees or bushes, and may be made ornamental in large gardens; if planted on the verges of wildernesses, where they will spread and cover the ground, they will have a good effect in winter, as their leaves continue green all the year; and during great part of the summer, their flowers will add to the variety. The flowers are cooling, emollient, and gently purgative, but they lose the greatest part of these virtues in drying, and as they can only be had fresh in the spring, the best method of using them is in form of a syrup, which, when carefully made, is very pleasant, and contains all the virtues of the flower. It is excellent, mixed with a small quantity of oil, to keep the bowels of children gently open, and may likewise be given with great success against habitual costiveness in grown people; it is also good in coughs, hoarsenesses, and other disorders of the breast. The seeds, dried and powdered, work gently by stool, increase the urinary discharge, and are excellent in the gravel, and all complaints of the kidneys and bladder. A decoction of the leaves is frequently an ingredient in clysters, for softening and lubricating the bowels. —Native of France, Spain, Italy, Switzerland, Algiers, and England; in the latter it occurs oftener than the preceding species, in moist woods and under hedges. It has been observed between Wandsworth and Putney Common, under Lord Stormont's park-pales; and in a field near Beckenham, in Kent.


LIBRARY
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CALIFORNIA

VIOLA ODORATA,

Sweet Violet.

VINCA ROSEA,

Madagascar Periwinkle.

Published by Henry Fisher. Caxton, Liverpool, Feb: 1820.

3. Vinca Lutea; *Yellow Periwinkle.* Stem twining; leaves oblong.—Native of Carolina.

4. Vinca Rosea; *Madagascar Periwinkle.* Stem suffrutescent, erect; flowers in pairs, sessile; leaves ovate-oblong; petioles two-toothed at the base. Stem bushy, quite erect, three feet high: the branches have the joints very close, and are covered with a smooth purple bark. The flowers are axillary and solitary, on very short peduncles; the upper surface of the petals is of a bright crimson or peach-colour, and their under side pale flesh-colour. There is a succession of flowers from February to the end of October. Those which appear early in the summer are succeeded by taper seed-vessels, filled with roundish black seeds, which ripen in autumn.—The seeds of this beautiful plant were originally brought from the island of Madagascar. They should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove, transplant them into a fresh hot-bed, at about four inches' distance, shading them till they have taken new root: then treat them in the same way as other natives of warm countries; taking great care to prevent their growing up weak, and not giving them too much water. When the plants have obtained strength, take them up carefully with balls of earth to their roots; plant them in pots filled with good earth, and plunge them into a moderate hot-bed to facilitate their taking new root, observing to screen them from the sun, and, when they are well rooted, to inure them gradually to bear the open air: but unless the summer prove warm, these plants should not be placed in the open air, for they will not thrive if exposed to cold and wet; therefore, even during the summer, they should be placed in an airy glass-case, and in winter remove them into the stove, where the air is kept to a temperate heat. It may also be increased by cuttings from the young shoots, planted in pots during any of the summer months. Plunge the pots into a moderate hot-bed, and if they are closely covered with bell or hand glasses, they will put out roots the more readily; when they have so done, they must be gradually hardened, and afterwards planted in larger pots, and treated as the seedling plants.

5. Vinca Parviflora; *Small-flowered Periwinkle.* Stem herbaceous, erect; leaves lanceolate, acute. Stem about a span high, slightly branched; flowers at the sides, and often at the top of the stem, in pairs. It flowers here in August.—Native of the East Indies.

Vine. See *Vitis.*

Viola; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth five-leaved, short, permanent; leaflets ovate, oblong, erect, more acute at the tip, obtuse at the base, fastened above the base, equal, but variously disposed, of which two support the uppermost petal, two others each a second and third lateral petals, and the remaining one the two lowest petals together. *Corolla:* five-petalled, irregular; petals unequal; the uppermost petal straight, turned downwards, wider, blunter, emarginate, finishing at the base in a blunt horned nectary, prominent between the leaflets of the calix; the two lateral ones paired, opposite, obtuse, straight; the two lowest paired, bigger, reflexed upwards. *Stamina:* filamenta five, very small, two of them, which are nearest to the uppermost petal, enter the nectary by annexed appendages; antheræ commonly connected, obtuse, increased by membranes at the tip. *Pistil:* germen superior, roundish; style filiform, prominent beyond the antheræ; stigmas oblique. *Pericarp:* capsule ovate, three-cornered, obtuse, one-celled, three-valved. *Seeds:* many, ovate, appendicled, fastened to the valves; receptacle linear, running like a line along each valve. *Observe.* The stigma, in the common March Violet, Viola Odorata, and its allies, is a simple reflexed hook; in the Pansy tribe, it is a concave head, perforated at the top. In the European species, the flower is always inverted; in the Indian, it is commonly straight; hence they have a different appearance. Essential Character. *Calix:* five-leaved. *Corolla:* five-petalled, irregular, horned at the back. *Antheræ:* cohering. *Capsule:* superior, one-celled, three-valved.—The species are,

* *Stemless.*

1. Viola Palmata; *Palmated Violet.* Stemless: leaves palmate, five-lobed, toothed, and undivided. Root perennial; flowers light blue, whitish at the base. This singular species is rare in this country, having no sweet scent to recommend it.—Native of Virginia. This and the next species will succeed best by putting them in pots, filled with loam and bog earth mixed, and plunged in a north border, where they may be sheltered in winter, or taken up and kept in a common hot-bed frame.

2. Viola Pedata; *Multifid-leaved Violet.* Stemless: leaves pedate, seven-parted, sometimes divided into nine parts or lobes. The flowers stand upon naked footstalks; they are light blue, and have no scent.—Native of North America.

3. Viola Pinnata; *Pinnate-leaved Violet.* Stemless: leaves pinnatifid; root slender, branched. This is rather smaller than the preceding species; the flower is pale blue, with darker veins, small, and on a scape three or four inches in length.—Native of the mountains of southern Europe.

4. Viola Sagittata; *Arrow-leaved Violet.* Stemless: leaves oblong, acute, cordate, sagittate, serrate, cut at the base; flowers blue, lower petal white towards the bottom, with purple veins; the rest longer and narrower, and white towards the base. It is perennial.—Native of Pennsylvania.

5. Viola Lanceolata; *Spear-leaved Violet.* Stemless: leaves lanceolate, crenate. Flowers white.—Native of Canada.

6. Viola Obliqua; *Oblique-flowered Violet.* Stemless: leaves cordate, acute, flattish, smooth; flowers erect; petals bent obliquely; they are oblong-ovate, straw-coloured, blue at the base. It flowers in May and June.—Native of Pennsylvania and Virginia.

7. Viola Cucullata; *Hollow-leaved Violet.* Stemless: leaves cordate, sharpish, cowled at the base; flowers inverted; petals bent obliquely.—Native of North America.

8. Viola Primulifolia; *Primrose-leaved Violet.* Stemless: leaves oblong, subcordate; petioles membranaceous. It flowers in June.—Native of North America.

9. Viola Hirta; *Hairy Violet.* Stemless: leaves cordate, they and the petioles hairy, hispid; calices obtuse; bractes below the middle of the peduncles. Root somewhat woody, fibrous; the whole herb of a hoary green, clothed with a soft pubescence; flower nodding, blue, scentless. It throws out leafy stalks, but then they are not procumbent, nor do they ever strike root as those of the eleventh species; hence it does not increase so fast, nor spread so wide. There is also some difference in their places of growth, this being confined to a calcareous soil, and often occurs in more exposed situations, nor is it so common as the Sweet Violet.—Native of various parts of Europe. It has been long since observed about Charlton, in the way to Lewisham, and near Sittingbourn, in Kent; in several parts of Essex; on the road from Ashley to Silverton Steeple; upon the confines of Cambridgeshire, towards Suffolk; in the Coppices of Oxfordshire, Shotover Hill, Stow wood, and in Magdalene College woods; upon Moorbarns, and at Cherry Hinton, in Cambridgeshire; at Markham, in Norfolk; at Baston Hill, in Bedfordshire; and on St. Vincent's rocks, near Bristol.

10. Viola Magellanica; *Magellanic Violet.* Stemless: leaves kidney-form, repand, villose. Flower large, yellow, with bay-coloured veins.—Native of Terra del Fuego.

11. Viola Odorata; *Sweet Violet.* Stemless: runners creeping; leaves cordate, they and the petioles smoothish: calices obtuse; bractes above the middle of the peduncle. Root fibrous, whitish: in old plants the upper part becomes knobby, and appears above ground; the knobs being formed from the base of the petioles, which are left yearly: from the bosom of these knobs spring the scions or runners, which creep on the ground, and are furnished with leaves, and the same kind of stipules which are observable at the bottom of the plant; these runners are very long, and in general do not produce flowers till the second year: flower nodding; corolla dark purple, varying to red, purple, pale flesh-colour, and white, possessing a most grateful fragrance. There are the following varieties of the Common Violet: the Single Blue and White, the Double Blue and White, and the Pale Purple; all of which are generally preserved in gardens. It has been found wild with double flowers, which are then so large, fragrant, and keep up their succession so long, by appearing later, that they are highly and deservedly valued.—This favourite flower, so universally esteemed for its fine odour, is a native of every part of Europe, in woods, among bushes, in hedges, and on warm banks; flowering in March and April, and ripening its seeds towards the end of summer. It is said to be common in some parts of Barbary, where the blue and white sorts grow promiscuously, and flower in winter. It is known also in Palestine, China, and Japan, where it flowers from January to April, and abounds by the way-sides. The variety with white flowers is very common in the chalky ground near Cambridge: the same was also seen by Dr. Withering growing wild about Birmingham, having the same fragrance, but without the hairs on the inside of the claws, by which that is distinguished.—It is of an astringent or binding nature. A strong decoction of the whole plant in water, with the addition of a little red wine, restrains immoderate menstrual discharges, the bleeeding of the piles, and other hæmorrhages. The root powdered, in the dose of a drachm, proves both emetic and cathartic. The syrup is very useful in chemistry, to detect an acid or an alkali; the former changing a blue colour to a red, and the latter to green: for this purpose the Violet is cultivated in great quantities at Stratford-upon-Avon. Slips of white paper, stained with the juice of the petals, and kept from the air and light, answer the same purpose.—*Propagation and Culture.* They are easily propagated by parting their roots, which may be performed at two seasons; the first and most common of which is at Michaelmas, that the young plants may be well rooted by winter: this is generally practised where the plants are put on the borders of wood-walks in large plantations, but in the gardens where they are cultivated for their flowers, the gardeners transplant and part them soon after their flowering season is over. They gather all the flowers first, and the plants which are then removed, having all the remaining summer to grow and get strength, will produce a greater quantity of flowers in the following spring, than those which are removed in autumn; but this should not be done where they cannot be supplied with water, till they have taken new root, unless in moist seasons. Place them, in planting, at a good distance from each other, to allow them room to spread, for if they be expected to produce many flowers, they should not be transplanted oftener than once in three or four years, and in that time the offsets will spread over the ground, if the roots be three feet asunder. They may also be propagated by seeds, which should be sown soon after they ripen, which will be at the end of August. The plants appear in the next spring, and when fit to remove may be transplanted into shady borders, to grow till autumn, and then they may be planted where they are to remain. The double-flowering sorts do not produce seeds. The other spring Violets are sometimes preserved in Botanic gardens, and may be propagated in the same way as the common sort, but require a moist soil and a shady situation. The upright sort not sending out shoots like the Common Violet, increases but slowly by offsets, but may be propagated by seeds, being as hardy as the former.

12. Viola Palustris; *Marsh Violet.* Stemless: leaves kidney-form, smooth. Root creeping, whitish, toothed, somewhat fleshy, with many fibres; flowers solitary, drooping, inodorous, paler and smaller than in the other species; sometimes flesh-coloured, with darker red veins; the two upper petals are scarcely streaked at all, the two lateral ones have one dark longitudinal line, the lowermost is beautifully marked with numerous branched streaks, and terminates in a short blunt spur behind. It is also distinguished from the other species by the greater roundness of its leaves, the paleness of its flowers, and its growing in bogs, or on the moist parts of sandy or turfy heaths.—Native of Europe and Japan. It is more common in Scotland and the north of England, than in the southern parts; but is found plentifully on the boggy parts of Shirley common, near Croydon; near Ampthill; between Oxford and Water Eyton; on Oakenshaw moor; and in Roadeshall woods; also on the borders of the lake west of Ballynahinch, in Ireland.

13. Viola Digitata. Leaves palmate, five to seven lobed; lobes entire; flowers pale blue.—Grows in Virginia.

14. Viola Dentata; *Tooth-leaved Violet.* Plant glabrous; leaves oblong, acute, serrate, subhastate, toothed at great length; peduncles shorter than the leaves; segments of the calix linear; petals three, inferior, bearded at the base; flowers nearly of the same colour with those of Viola Sagittata.—Grows in the wet meadows and woods of Pennsylvania.

15. Viola Blanda; *White-flowered Violet.* Plant glabrous; leaves cordate, remotely serrate; peduncles of the length of the leaves; petals without beards, the two lateral ones shorter, lowest one longer than the rest, lanceolate; flowers yellowish-white; lower petal marked with blue stripes and veins. Perennial.—Grows in wet places and bog-meadows, from New York to Carolina.

16. Viola Sororia; *White-rooted Violet.* Leaves cordate, crenate-serrate, obtuse, pubescent underneath; peduncles shorter than the leaves; petals oblong, lowest one bearded at the base, veined; flowers blue, white at the bottom.—Grows in the overflowed meadows of Pennsylvania, &c.

17. Viola Papilionacea; *Butterfly Violet.* Leaves triangular-cordate, acute, crenate, subcucullate, slightly glabrous; peduncles of the length of the leaves; petals obovate; flowers blue, elegantly striated, and bearded with yellow down. Perennial.—Grows near Philadelphia, in wet places.

18. Viola Clandestina; *Subterraneous Violet.* Plant slightly glabrous; leaves suborbiculate; serratures glandulose; suckers floriferous; petals linear, scarcely longer than the calix.—Grows on the high mountains of Pennsylvania, in shady beech-woods, among rotten wood and rich vegetable mould. This singular species differs from all the rest, in producing its flowers as it were under the ground, being always covered with rotten wood or leaves: they are of a chocolate-brown, very small. The seed-vessel buries itself still deeper in the ground, and is large in proportion to the plant. The inhabitants know it by the name of *Heal-all*, being used by them in curing all kinds of wounds or sores.

** *With leafy Stems.*

19. Viola Canina; *Dog's Violet.* Stem, when advanced, ascending, channelled; leaves oblong-cordate; calices acute. Root somewhat woody; the first flower radical; but several branched, angular, leafy stems, soon creep forth, and continue growing and bearing numerous flowers for several weeks; flower-stalks axillary, solitary, erect, square, bearing two awl-shaped bractes in the upper part, and one nodding blue flower. This differs from the Sweet Violet, in having no smell, and the flower is generally larger, and growing from the stem. It produces seed during the summer months, without any expanded corolla. After the flowers of the Sweet Violet are gone, every coppice, heath, hedge, bank, and shady dell, is decorated for two or three months with the paler blossoms of the Dog Violet, which seems to have been named, like the Hedge Rose, to express a degree of inferiority. It varies in the colour of its flowers, in the size of the whole herb, and in the form of the leaves. Sometimes it occurs with a white flower; at others the spur only is white. An alpine variety has been observed in Wales, with a subtriflorous stem, and cordate deeply serrate leaves.

20. Viola Lactea; *Cream-coloured Violet.* Stem ascending, round; leaves ovate-lanceolate; stipules gash-serrate. This is quite smooth, and the herb is much smaller in all its parts than the preceding; peduncles axillary, solitary, erect, rising as high as the branches, each bearing above its middle a pair of purplish lanceolate bractes, mostly toothed near their base, and at the top one a nodding flower. It appears in May.—Observed in the wolds near Tunbridge Wells, and at Pendarvis in Cornwall.

21. Viola Montana; *Mountain Violet.* Stems erect; leaves cordate, oblong; petioles long, erect, with very large lanceolate bristles; upper petals blue; middle ones pale, bearded; lowest with a broad yellow claw, with deep blue lines: sometimes the flower is wholly blue, and sometimes mostly yellow; spur short, inodorous.—Native of the mountains of Lapland, Germany, and Switzerland. A hardy perennial in our gardens, flowering in May and June.

22. Viola Concolor; *Green-flowered Violet.* Stem erect; leaves broad-lanceolate, and stipules linear, quite entire; flowers small, pale green, of the same colour with the plant.—Native of the bogs of North America.

23. Viola Nummularifolia. Stems undivided, very short; leaves roundish-cordate, subcrenate; stipules toothed: root black and knobbed. It is a very small plant, three or four inches high, with the peduncles two-thirds of its length; flower small, nodding, pale blue or whitish, with a blunt spur half the length of the calix.—Native of the alps of Dauphiny, and of Piedmont.

24. Viola Cenisia. Stems filiform, undivided, procumbent; leaves ovate, petioled, the edge of the base ciliate; stipules undivided; flowers large, blue, with a spur, shorter than the petals.—Native of Mount Cenis, &c.

25. Viola Canadensis; *Canadian Violet.* Stem erect, roundish; leaves cordate, acuminate, smooth; stipules slightly notched, capsule downy. Flowers sweet-scented, externally purplish-blue, internally white, elegantly veined.—Native of North America.

26. Viola Striata; *Striated Violet.* Stem erect, semicylindric; leaves ovate, cordate, acute, serrate; stipules lanceolate, serrate, ciliate. Flowers white, with purple veins.—Native of North America. Perennial.

27. Viola Pubescens; *Downy Violet.* Stem erect, villose, round, flattish on one side; leaves cordate, pubescent; stipules oblong, serrulate at the tip. Flowers yellow, with brown veins.—Native of North America.

28. Viola Mirabilis; *Broad-leaved Violet.* Stem three-sided; leaves kidney-form, cordate; stipules lanceolate, quite entire; flowers on the stem commonly apetalous. The flowers come out early in the spring among the young leaves, smell sweet, and are of a light reddish-purple, with a veiny lip.—Found in Sweden, Germany, and Austria. Perennial.

29. Viola Biflora; *Two-flowered Violet.* Stem two-flowered; leaves kidney-form, serrate; peduncles two, filiform, compressed a little, one terminating the other, axillary; corollas yellow, the claws of the petals with dark veins.—Native of the alps of Europe.

30. Viola Uniflora; *Siberian Violet.* Stem one-flowered; leaves cordate, toothed. Flowers yellow.—Native of Siberia.

31. Viola Decumbens; *Trailing Violet.* Caulescent, procumbent: leaves linear, clustered; corolla blue, spurred. Perennial.—Native of the Cape.

32. Viola Rostrata; *Dark-spur Violet.* Plant glabrous; leaves cordate, acute, serrate; peduncles as long again as the leaves; stipules lanceolate, serrate-ciliate; nectaries rostrate, longer than the corolla; flowers blue.—Grows on shady rocks, near Eastown, Pennsylvania.

33. Viola Hastata; *Halbert-leaved Violet.* Plant glabrous; stem simple, leafy on the upper part; leaves hastate, with short petioles; stipules minute, denticulate; flowers yellow.—Grows on high mountains from Pennsylvania to Carolina.

34. Viola Nuttallii; *Yellow Missouri Violet.* This species was discovered by Mr. Thomas Nuttall, and named by Pursh after its discoverer. Mr. Nuttall's description of it is as follows: Plant perennial; stem simple, erect, and leafy, from four to six inches high; leaves lanceolate-ovate, entire, attenuated down the petiole, opaque; margin and nerves minutely pubescent; leaf and petiole three to four inches long, scarcely half an inch wide; stipules long, linear-lanceolate, entire; flowers small, yellow; petals purplish on the under side; segments of the calix linear-lanceolate, acute; stigma capitate, erostrate, nearly smooth. It flowers in May.—Grows near the confluence of Rock river and the Missouri, and from thence to the mountains. This is the only species of Viola on the plains of the Missouri, from the confluence of the river Platte to Fort Mandan.

*** *Stipules pinnatifid; Stigma urceolate.*

35. Viola Tricolor; *Pansy Violet*, or *Heart's Ease.* Stem angular, diffused; leaves oblong, tooth-crenate; stipules lyrate, pinnatifid. Root annual, simple, fibrous; peduncles axillary, solitary, longer than the leaves; lower ones spreading, somewhat declining, with a pair of small bractes at a short distance below the flower; petals obcordate, shorter than the calix, and whitish or yellow-white in its truly wild state, when it appears as a weed among corn; but in gardens the petals are longer than the calix, and are variegated with yellow and purple. Some of the varieties have very large and beautiful odoriferous flowers, others have small scentless ones; some have the two upper petals of a deep yellow colour, with a purple spot in each, the two middle of a paler yellow, with a deep yellow spot, and the lower petal like velvet; in others again the petals are white, with yellow and purple spots; in some the yellow is the most prevailing colour, and in others purple. This has always been a favourite flower with the vulgar, who it is to be feared will never be so thoroughly refined as to value any thing highly merely because it may happen to be scarce. Most of the provincial names bear strong allusions to love, viz. 'Kiss me behind the garden gate;' 'Call me to you;' 'Three faces under a hood;' though *Heart's Ease*, the name by which it is now generally known, seems to bear no affinity to the tender passion. It was represented by old writers as a powerful medicine in epilepsy,

asthma, ulcers, scabies, and cutaneous complaints; but has latterly been recommended by a German physician and others, as a specific in the *crusta lactea*, or scald head, of children. For this disease, a handful of the fresh herb, or half a drachm of it dried, boiled two hours in half a pint of milk, is to be taken night and morning. Bread, with this decoction, is also to be formed into a poultice, and applied to the part. By this treatment it has been observed, that the eruption during the first eight days increases; and that the urine, when the medicine succeeds, has a nauseous odour, similar to that of cat's, which goes off as the use of the plant is continued, and the scabs disappear, till the skin recovers its natural purity. The leaves are a good application to wounds, and are sometimes given to young children troubled with griping pains, which they remove, and prevent those fits which are too frequently occasioned thereby.—Native of Europe, Siberia, and Japan, in corn-fields and gardens, flowering from May to September, and later in mild seasons.—*Propagation*, &c. The several sorts of Pansies will scatter their seeds in a short time after the flowers are past; and from these self-sown seeds, the plants which come up in autumn will flower very early in the spring, and will be succeeded by the spring plants: so that where they are indulged in a garden, and their seeds are permitted to scatter, there will be a constant succession of their flowers during the greatest part of the year; for they will flower all the winter in mild seasons, and most part of the summer in shady situations, which renders them worthy of a place in every good garden; but there they must not be allowed to spread far, lest they become troublesome weeds, for the seeds are cast out of their covers with great elasticity to a considerable distance, and they will, if permitted, soon occupy a large space of ground.

36. Viola Grandiflora; *Great-flowered Pansy Violet.* Stem three-sided, simple; leaves somewhat oblong; stipules pinnatifid. Root creeping; flower three-coloured, principally yellow.—Native of Siberia, Switzerland, Silesia, &c.

37. Viola Lutea; *Yellow Mountain Pansy Violet.* Stem three-sided, simple; leaves ovate-oblong, crenate, ciliate. Root perennial, small, slender; petals either all yellow with dark purple radiating veins, or the two uppermost blue-purple, and the rest yellow with a blue tinge, or sometimes wholly purple.—This species is found only in mountainous pastures: it abounds in the north of England, Scotland, and in a rotten peaty soil in the wildest parts of South Wales. Found also near Latham in Lancashire; between Malham and Settle; and about Halifax in Yorkshire; on the moorlands of Staffordshire, between Leek and Buxton; in Scotland, on Broughton heights in Tweeddale, and on Pentland hills, two miles south of Fast Castle; at Crawford John, near the head-hills in Lanerkshire; and with a purple flower, on Mallgyrdy in Breadalbane. It flowers from May to September.—The Great Yellow Violet propagates by offsets in pretty great plenty, if it has a moist soil and a shady situation; this may be transplanted in autumn, and the offsets may then be taken off; but the roots should not be divided into small heads; nor should they be too often transplanted, because they will not produce many flowers, unless the plants are strong, and have good root in the ground. It requires a moist soil, and shady situation.

38. Viola Zoysii; *Dwarf Carinthian Pansy.* Stem very short, erect; leaves roundish, crenate; stipules quite entire; peduncles three-sided. The flowers are yellow with a blue spur.—Native of the mountains of Carinthia.

39. Viola Calcarata; *Alpine* or *Long-spurred Violet.* Stem abbreviated; leaves roundish-cordate, crenate; stipules roundish, toothed; nectaries longer than the calix. The flower is large, with a slender spur from three to six lines in length: it is sometimes white, and found with flowers smaller by half than common, but having the same smell and colour: they appear in May.—Native of the European Alps.

40. Viola Cornuta; *Pyrenæan Violet.* Stem elongated; leaves ovate, subcordate, ciliate at the edge; stipules oblong, pinnatifid; nectaries awl-shaped, longer than the corolla. This differs from the preceding in having a long erect stem, and oblong petals, less than the leaves. It flowers in May.—Native of the Pyrenees.

41. Viola Capensis; *Cape Violet.* Suffruticose: stem erect; leaves obovate.—Native of the Cape.

42. Viola Arborescens; *Shrubby Violet.* Stem shrubby, leaves lanceolate, quite entire.—Native of Spain.

**** *Flowers erect, not inverted.*

43. Viola Stipularis; *West Indian Violet.* Stem simple, creeping; leaves ovate, lanceolate, crenate, smooth; stipules ciliate; peduncles solitary, terminating. Perennial.—Native of the island of St. Christopher in the West Indies.

44. Viola Parviflora; *Small-flowered Violet.* Stems diffused, weak, many-leaved; leaves ovate, petioled, serrate; flowers axillary, solitary. Root perennial, cylindric, thickness of a pigeon's quill, flexuose, torulose, ash-coloured. The flower is the smallest of all the Violets.—Native of the hottest regions of South America.

45. Viola Enneasperma; *Nine-seeded Violet.* Stem very much branched at the base; leaves lanceolate-linear, quite entire, distant; calices equal behind. Root long, simple, perennial; peduncles axillary, capillary, solitary, one-flowered; flowers blue, soon falling off.—Native of the East Indies.

46. Viola Linarifolia; *Toadflax-leaved Violet.* Suffruticose, branched; leaves linear-lanceolate, opposite, and alternate, almost quite entire, smooth; peduncles axillary, solitary.—Native of Santa Cruz in the West Indies.

47. Viola Suffruticosa. Stem procumbent; leaves lanceolate, subserrate, clustered; calices equal behind.—Native of the East Indies.

48. Viola Calceolaria. Stem simple, hirsute, herbaceous; leaves lanceolate, hairy; flower solitary, of a white or blue colour: the fifth petal is very large and rhomboid.—Native of Cumana, Cayenne, and Martinico.

49. Viola Oppositifolia. Stem suffruticose, brachiate; leaves opposite; flowers racemed. Shrubby.—Native of Cumana.

50. Viola Hybanthus. Arborescent, scandent, prickly: leaves oblong, obtuse, smooth; flowers small, inodorous, with whitish corollas scarcely to be examined with the naked eye.—Native of South America.

51. Viola Ipecacuanha; *Ipecacuanha Violet.* Leaves oval, hairy on the edge and beneath. Root fibrous, white, branched; petals five, white. The root is reported to possess the qualities of the true Ipecacuanha, though in a weaker degree.—Native of Brazil.

52. Viola Diandra. Stem creeping, herbaceous; leaves oblong; peduncles one-flowered; corolla white.—Native of Germany.

53. Viola Bicolor. Plant subpubescent; stem angulated, simple; lower leaves rotundate-spathulate, subdentate; upper leaves lanceolate, entire; stipules pectinate-pinnatifid; calices acute, as short again as the corolla; flowers small, white, with a few purple veins.—It grows in Pennsylvania and Virginia.

Violet, Corn. See *Campanula Hybrida.*

Violet, Damask, and *Violet, Dame's.* See *Hesperis.*

Violet, Dog-tooth. See *Erythronium.*

Viper's Bugloss. See *Echium.*

Viper's Grass. See *Scorzonera.*

Virecta; a genus of the class Pentandria, order Monogynia. —Generic Character. *Calix:* perianth five-leaved, permanent, superior; leaflets subulate-setaceous, equal, erect; teeth between the calix-leaves very small, glandular, solitary, between each pair. *Corolla:* one-petalled, funnel-form; tube three times as long as the calix, slender, equal, erect; border five-parted, equal, flat; segments ovate, entire. *Stamina:* filamenta five, inserted into the middle of the tube, very short; antheræ linear, subulate, converging. *Pistil:* germen inferior, globular, within the calix, terminated by a raised permanent circle; style filiform, smooth; stigma two-parted; segments setaceous. *Pericarp:* capsule globular, angular, hispid, crowned with the calix, two-celled, two-valved, the partitions transverse, from the centre of each valve. *Receptacle:* fleshy, filling the capsule, covered with one row of seeds. *Seeds:* numerous, small, angular, hollow, dotted. Essential Character. *Calix:* five-leafed, with teeth interposed. *Corolla:* funnel-form. *Stigma:* two-parted. *Capsule:* two-celled, two-valved, many-seeded, inferior.——The species are,

1. Virecta Biflora; *Two-flowered Virecta.* Leaves ovate; peduncles two-flowered. Root annual; stem round, a span high or more, simple, sometimes rooting, pubescent; corolla becoming red, with a white mouth.—Native of Surinam.

2. Virecta Pratensis; *Many-flowered Virecta.* Leaves lanceolate; peduncles many-flowered. Stems two feet high; branches roundish, opposite, with close-pressed hairs scattered over them; flowers four to six at the top of the peduncle, scarcely pedicelled; germen crowned at the edge; stigma club-shaped.—Native of Guiana.

Virginian Acacia. See *Robinia.*

Virginian Cowslip. See *Dodecathon Meadia.*

Virginian Creeper. See *Clematis.*

Virginian Guelder Rose. See *Spiræa Opulifolia.*

Virginian Poke. See *Phytolacca Decandra.*

Virginian Silk. See *Periploca.*

Virgin's Bower. See *Clematis.*

Viscum; a genus of the class Diœcia, order Tetrandria. —Generic Character. *Male. Calix:* perianth four-parted; leaflets ovate, equal. *Corolla:* none. *Stamina:* filamenta none; antheræ four, oblong, acuminate, one growing to each calix-leaf. *Female,* commonly opposite to the male. *Calix:* perianth four-leaved; leaflets ovate, small, sessile, deciduous, placed on the germen. *Corolla:* none. *Pistil:* germen oblong, three-cornered, indistinctly crowned with a four-cleft margin, inferior; style none; stigma obtuse, scarcely emarginate. *Pericarp:* berry globular, one-celled, even. *Seed:* solitary, cordate, compressed, obtuse, fleshy. Essential Character. *Male. Calix:* four-parted. *Corolla:* none. *Filamenta:* none. *Antheræ:* fastened to the calix. *Female. Calix:* four-leaved, superior. *Corolla:* none. *Style:* none. *Berry:* one-seeded. *Seed:* cordate.——The species are,

1. Viscum Album; *Common* or *White Misseltoe.* Leaves lanceolate, obtuse; stem dichotomous; spikes axillary. This plant, instead of rooting and growing in the earth, fixes itself to the branches of trees, where it spreads and forms a bush. The branches are woody. The flowers come out from the axils in short spikes, and are composed of four greenish-yellow calix-leaves. The female flowers are succeeded by round white berries, which are almost pellucid, about the size of currants, full of a tough viscid juice, in the middle of which lies one heart-shaped flat seed. The root insinuates its fibres into the woody substance of the tree on which it grows. The stem affords one of the best instances we have of what Linneus calls *dichotomous,* in its mode of branching. The Misseltoe has been celebrated from the time of the Druids, both as a sacred plant and a medicine: the very Oak on which it grew was also held sacred. The Druids sent round their attendant youths with branches of the Misseltoe, to announce the entrance of the new year; and this custom has continued down to modern times, for in some parts of France the children run about from house to house, asking for Misseltoe in rude rhymes, and calling out, *Aguilaneuf,* that is, *A gui l'an neuf,* or, To the Misseltoe, 'tis the new year; and in England branches of this plant are hung up in most houses among other Christmas evergreens. As a medicine, the Misseltoe of the Oak obtained great reputation for the cure of the epilepsy; and Villars administered the dry leaves in powder to two children between eight and ten years of age, who were epileptic, and were cured by it; but he observes, that others were cured by emetics and Jesuits' bark, whilst some patients have resisted all these remedies, together with cauteries, setons, extracts of Henbane, and electricity. Colbatch has however strongly recommended it in various convulsive disorders. He administered it in substance in doses of half a drachm of the wood or leaves, or an infusion of an ounce. This author was followed by others, who have not only borne testimony to its efficacy in convulsions, but also in those complaints denominated nervous, in which it was supposed to act in the character of a tonic. The leaves reduced to powder, and taken in carduus or poppy water, are a good medicine in pleuretic complaints. The berries are taken by country people when they find themselves troubled with severe stitches, and they yield almost instantaneous relief. The bark and the berries may both be made into birdlime, which being applied to hard swellings in any part of the body, ripens them in a short space of time. The berries are devoured by several large birds, as the blackbird, fieldfare, and thrush, thence named Missel thrush or Misseltoe bird. Birdlime is made from these berries, and also from the bark. The berries are boiled in water till they burst, then are well beaten in a mortar, and afterwards washed till all the branny husks are cleared away. The Italians make their birdlime of the berries heated and mixed with oil, as is also that which they make of Holly bark, and add turpentine to make it bear water. The birdlime now commonly used with us is made of the bark of the Holly, which is stripped off about Midsummer: it is boiled for ten or twelve hours, and, when the green coat separates from the other, is covered with Fern for a fortnight, and put in a moist place; by that time the bark will be turned to a jelly, and no fibres left: it is then beaten in a stone mortar till it becomes a tough paste: this is washed in a running stream, till no motes appear; then put up to ferment four or five days, and is scummed as often as any thing arises, and then laid up for use. When used, a third part of oil is incorporated with it over the fire. The bark of our Way-faring shrub will, it is said, make as good birdlime as that of the Holly.—Found throughout Europe, on the branches of old Apple-trees, Hawthorns, Lime-trees, Oaks, Firs, &c. flowering in the spring.—*Propagation, &c.* Misseltoe is always produced from seed, and cannot be cultivated in the earth like most other plants, but will always grow upon trees: hence the ancients thought it was an excrescence of the tree, without any seed being previously lodged there. It is propagated by birds, who eat the seeds as food, and then void them accidentally upon the branches of trees, where the few seeds which escape the digestive power of their stomachs, adhere and grow. It appears to grow equally well upon any kind of tree, and to possess the same properties wherever

found. Mr. Ray saw a seed inserted into the bark of a White Poplar-tree, by boring a hole, which grew freely; and many persons have succeeded in the same experiment by rubbing the berries on the smooth bark of the under side of the branches of various trees, or inserting them into small clefts made for that purpose.

2. Viscum Rubrum; *Red-berried Misseltoe.* Leaves lanceolate-obtuse; spikes lateral. The berries are round and red.—It is found growing principally upon Mahogany-trees, in the Bahamas; found also in Carolina.

3. Viscum Purpureum; *Purple-berried Misseltoe.* Leaves obovate; racemes lateral.—Native of America and the West Indies, growing principally on the Manchineel-tree.

4. Viscum Opuntioides; *Indian Fig-like Misseltoe.* Stem proliferous, very much branched, leafless; joints wedge-shaped, furrowed, compressed. The flat joints at once distinguish this species: each joint is rather more than an inch long, of a yellowish-green. Flowers small, terminating each joint, in pairs; berries white.—Native of Jamaica and of the Society Islands; found upon trees.

5. Viscum Japonicum; *Japanese Misseltoe.* Stem proliferous, branched, leafless; joints three-cornered; branches dichotomous.—Native of Japan.

6. Viscum Capense; *Cape Misseltoe.* Leaflets with brachiate branches. It has no leaves, like the two preceding species.—Found upon trees at the Cape.

7. Viscum Verticillatum; *Whorled Misseltoe.* Stem whorled; leaves ovate, three-nerved, blunt.—Native of the northern parts of Jamaica, where it is used in medicine.

8. Viscum Flavens; *Yellow Misseltoe.* Leaves ovate, veined; racemes axillary, in threes or fours on each side. Shrubby.—Native of the West Indies and Guiana.

9. Viscum Pauciflorum; *Few-flowered Misseltoe.* Leaves ovate, obtuse, nerveless; flowers scattered, solitary; stem shrubby; branches alternate.—Native of the Cape.

10. Viscum Capitellatum; *Capitate Misseltoe.* Leaves wedge-shaped, concave, obtuse; berries capitate, on axillary stalks. Stems three inches high, branched, roughish to the touch.—Found in Ceylon by Koenig.

11. Viscum Rotundifolium; *Round-leaved Misseltoe.* Leaves orbicular; flowers in whorls.—Native of the Cape.

12. Viscum Antarcticum; *New Zealand Misseltoe.* Leaves ovate, quite entire; racemes on the branches, and terminating, jointed.—Native of New Zealand.

Vismea; a genus of the class Dodecandria, order Trigynia.—GENERIC CHARACTER. *Calix:* perianth five-leaved, permanent; leaflets lanceolate, recurved, three outer hairy. *Corolla:* petals five, elliptic, spreading, scarcely longer than the calix. *Stamina:* filamenta twelve, filiform, erect, shorter than the petals, inserted into the receptacle; antheræ quadrangular, erect, terminated by an awn. *Pistil:* germen rough-haired, superior, attenuated as it were into a very short rough-haired style; styles three, filiform, smooth; stigmas simple. *Pericarp:* nut ovate, smooth, acuminate, two or three celled, half-inferior, enclosed within the converging calix-leaves, and for the most part covered by the one-leafed part of the calix, which is connate with the nut, but a third of the upper part of the nut within the calix is naked. *Seeds:* in each cell one. ESSENTIAL CHARACTER. *Calix:* five-leaved, inferior. *Corolla:* five-petalled. *Nut:* two or three celled, half-inferior.——The only known species is,

1. Vismea Mocanera. A small shrub, with a round, rugged, or somewhat warty stem; leaves alternate, erect, on short petioles, elliptic, very smooth, veined, serrate; peduncles axillary, solitary, nodding, scarcely longer than the petioles, naked, one-flowered; flowers small; corolla yellow. When the flower is impregnated, the peduncle is erected, the calix closed and thickened, and its three outer leaflets become brown and hairy.—Found in mountain-woods in the Canary Islands.

Vitex; a genus of the class Didynamia, order Angiospermia.—GENERIC CHARACTER. *Calix:* perianth one-leafed, tubular, cylindric, very short, five-toothed. *Corolla:* one-petalled, ringent; tube cylindric, slender, curved; border flat, two-lipped; upper lip trifid, with the middle segment wider; lower lip trifid, with the middle segment bigger. *Stamina:* filamenta four, capillary, a little longer than the tube, two of which are shorter than the others; antheræ versatile. *Pistil:* germen roundish; style filiform, length of the tube; stigmas two, awl-shaped, spreading. *Pericarp:* berry or drupe globular, four-celled. *Seeds:* solitary, ovate. ESSENTIAL CHARACTER. *Calix:* five-toothed. *Corolla:* border two-lipped; middle segment of the lower lip largest. *Drupe:* one-seeded, a four-celled nut.——The species are,

1. Vitex Ovata; *Ovate-leaved Chaste Tree.* Leaves simple, ovate. Stem shrubby, trailing, with quadrangular branches; flowers at the top of the branches, at first axillary, but finally terminating and panicled; panicle subtrichotomous; calix hoary; corolla purplish.—Native of China and Japan.

2. Vitex Triflora; *Three-flowered Chaste Tree.* Leaves ternate, smooth; peduncles axillary and terminating, three-flowered. Branches below roundish, smooth, purplish above, four-cornered, with a rust-coloured down, jointed; joints two inches long; gems golden rust-colour; petioles purplish.—Native of Cayenne.

3. Vitex Divaricata; *Spreading Chaste Tree.* Leaves quite entire, smooth on both sides, the middle one very large, with a dichotomous divaricating panicle. A tree; the branches obscurely four-cornered, smooth, with an ash-coloured bark; flowers whitish, five-cleft.—Native of the West India Islands.

4. Vitex Pubescens; *Downy Chaste Tree.* Leaves ternate, pubescent; panicles trichotomous; bractes length of the calix, four-cornered, pubescent. Flowers six or seven on the outmost branches of the panicle, sessile, alternate. It differs from the ninth species in having the leaves not hoary beneath, the pedicels not dichotomous, the flowers longitudinally sessile and alternate.—Native of the East Indies.

5. Vitex Altissima; *Tall Chaste Tree.* Leaves ternate, quite entire, downy beneath; panicle whorled. A tree, fifty feet high, with a heavy reddish wood. Flowers small, sweet-scented, blueish, numerous; berry three-seeded.—Found in the vast woods of Ceylon.

6. Vitex Agnus-Castus; *Officinal Chaste Tree.* Leaves digitate, seven or five leaved, lanceolate, mostly quite entire, spiked, whorled, panicled. Stalk shrubby, eight or ten feet high, sending out their whole length opposite branches, which are angular, pliable, covered with a grayish bark. The flowers are produced in spikes at the extremity of the branches, from seven to fifteen inches in length, composed of distant whorls; in some plants they are white, and in others blue: they have an agreeable odour when they open fair, and make a good appearance in autumn, when the flowers of most other shrubs are gone. They are generally late before they appear, so that in bad seasons they do not open fair in England, and even in warm years produce no seeds. The seeds were formerly in repute for securing chastity; hence the Athenian matrons, in the sacred rites of Ceres, used to string their couches with the leaves. The scent of the fresh plant is peculiarly unpleasant, causing a degree of nausea or faintness; which perhaps may account for its reputed virtues.—*Propagation. &c.* It is very hardy, and may be

propagated by planting the cuttings early in spring, before they shoot, in a fresh light soil, watering them frequently before they take root; after which the plants must be carefully cleared from weeds during the summer season, and if the following winter prove severe, a little mulch must be laid upon the surface of the ground between the plants, to prevent the frost from penetrating to their roots. As the cuttings are apt to shoot late in the year, their tops will be very tender, and the early frosts in the autumn often cut them down a considerable length, if they are not protected by mats or some other covering. Towards the middle of March, in favourable seasons, transplant them either into the place where they are designed to remain, or into a nursery to grow two or three years to get strength, where they must be pruned up, in order to form them into regular stalks, as they are liable to shoot out their branches in a straggling manner. They may also be propagated by laying down their branches in the spring of the year, in doing which be careful not to break them, for their shoots are apt to split if they are violently forced; these will take root in one year, if watered in very dry weather, and may then be transplanted, and managed as directed for those raised from cuttings.

7. Vitex Incisa; *Cut-leaved Chaste Tree.* Leaves digitate, quinate, gash-pinnatifid; spikes subverticillate. The branches are terminated by spikes of flowers, three or four inches long, disposed in whorls; in some plants they are white, in others blue, and some have bright red flowers. They are in beauty from the middle of July to the beginning of September, but no seeds are produced in Europe.—*Propagation, &c.* Plant cuttings in the spring in pots, plunging them into a moderate hot-bed, and covering them with glasses. When these are well rooted, take them carefully up, and plant each in a separate small pot filled with light earth, placing them in the shade until they have taken new root: then remove them to a sheltered situation with other green-house plants, where they may remain all the summer. In autumn they must be put under shelter, but as they cast their leaves early, they should not be much watered in winter. They are late in putting out new leaves in the spring, and have the appearance of dead plants, before the leaves appear.

8. Vitex Leucoxylon; *White-wooded Chaste Tree.* Leaves digitate, quinate; leaflets petioled, oblong, quite entire; panicles dichotomous; berry one-seeded. It differs from the next species in having the leaves very smooth on both sides. —Native of Ceylon.

9. Vitex Trifolia; *Three-leaved Chaste Tree.* Leaves ternate and quinate; leaflets ovate, acute, quite entire, hoary beneath; panicle with a straight rachis; pedicels dichotomous. It is in great esteem both for internal and external use among Indian practitioners. The plant has a bitter taste, with a strong aromatic smell. The fruit, in the eastern countries, is reputed to be warm, discutient, nervine, cephalic, and emmenagogue; and to be useful in paralysis, weakness, and pains of the limbs.—Native of the East Indies. This species is too tender to live in the open air in this country, and therefore must be planted in pots, and constantly kept in the stove. It is propagated both by cuttings and layers: the cuttings must be planted in pots, and plunged into a moderate hot-bed, covering them close with a hand or bell glass, to exclude the air; they should be refreshed with water now and then, but it must be given sparingly. The best time to plant the cuttings is about the middle or latter end of April; for if they succeed they will put out roots in six or seven weeks, and will then begin to shoot; they should therefore have the free air gradually admitted to them, to prevent their shooting weak; then they may be carefully taken up, and each planted into a separate small pot filled with light earth, and plunged into the hot-bed again, shading them from the sun till they have taken new root; after which they should have plenty of free air at all times when the weather is good, treating them in the same manner as other tender plants.

10. Vitex Umbrosa; *Umbrageous Chaste Tree.* Leaves quinate, quite entire, smooth on both sides; racemes compound, axillary. A large spreading tree, with nearly cylindrical branches, leafy at the summit.—Native of Jamaica.

11. Vitex Capitata; *Capitate Chaste Tree.* Leaves quinate, digitate; leaflets lanceolate, smooth, quite entire; flowers capitate, subumbelled. Branches roundish, warted, at the warts a little dilated and four-cornered, smooth, with an ash-coloured bark, even; branchlets leafing and flowering, the lower alternate, the end ones often in threes, alternately compressed; peduncles axillary, solitary, length of the petiole, smooth, slender.—Native of Trinidad.

12. Vitex Negundo; *Five-leaved Chaste Tree.* Leaves quinate and ternate, serrate; flowers raceme-panicled. Stem arboreous, twisted, the thickness of the human arm, with spreading branches; flowers in opposite, axillary, whorled spikes, terminating the branches, blue.—Native of the East Indies, China, and Cochin-china. See the seventh species.

13. Vitex Spicata. Leaves quinate, crenate; spikes linear, terminating. Stem shrubby, erect, eight feet high, thick; corolla tube short, globular. It has the same qualities as the ninth species: the leaves are used externally in wandering pains, paralysis, and contraction of the limbs.—Native of China, and Cochin-china. It is increased by cuttings in the spring, a little before the buds open, and must be managed in the same way as the seventh species.

14. Vitex Pinnata; *Pinnate Chaste Tree.* Leaves pinnate, quite entire; panicles trichotomous. This is a tree eight feet high, with the wood hard and yellowish, the bark thin and brown, the branches spreading, and the head very close and thick; flowers yellow, very small, globular, sweet-smelling, upon oblong, axillary racemes; fruit small, red.—Native of China and Cochin-china, where it is cultivated in the gardens of the great for its beauty and sweetness. See the seventh and ninth species for its culture, &c.

Vitis; a genus of the class Pentandria, order Monogynia. —Generic Character. *Calix:* perianth one-leafed, five-toothed, very small. *Corolla:* petals five, rude, small, caducous. *Stamina:* filamenta five, awl-shaped, from erect spreading, deciduous; antheræ simple. *Pistil:* germen ovate; style none, or very short; stigma obtuse, headed. *Pericarp:* berry globular, ovate, one-celled. *Seeds:* five, bony, turbinate, cordate, contracted at the base, semilocular. Essential Character. *Petals:* cohering at the top, shrivelling. *Berry:* five-seeded, superior.——The species are,

1. Vitis Vinifera; *Common Vine.* Leaves heart-shaped, five-lobed, sinuate, naked. Stem twisted, irregular, weak, covered with a brown cloven bark; branches very long, tough, flexible, trailing along the ground, or climbing trees by means of tendrils, which are opposite to a leaf, and are attended by the flowers in a raceme; the flowers are whitish and herbaceous, very small and insignificant in appearance, but having a very agreeable smell; the petals cohere at the tip, forming a veil concealing the genitals, but they soon fall off; berries globular, in some varieties ovate, before they are ripe regularly divided into five cells, but afterwards one-celled, almost pellucid, coloured in some, colourless in others. In the middle is a short column, springing from the woody pedicel of the berry; to the top of this the seeds are fastened by its peculiar umbilical chord; this chord is filiform, running

along the inner side of the seed to its very top, then reflected to the back, and finally entering the navel; the seeds naturally five, but generally fewer, others have not discovered more than two, and in some berries they are all abortive.—The Vine was gradually introduced into the different countries of southern Europe from the East, where we know it was cultivated from the time of Noah. In the age of Homer it grew wild in the island of Sicily, and probably in the adjacent continent, but it appears not to have been improved by cultivation, nor did the rude inhabitants extract the liquor from it. A thousand years afterwards, Italy could boast, that of the fourscore most generous and celebrated wines, more than two-thirds were the productions of her own soil. The blessing was soon communicated to the Narbonese province of Gaul; but so inteuse was the cold to the north of the Cevennes, that in the time of Strabo it was thought impossible to ripen grapes in those parts of Gaul. This difficulty, however, was gradually vanquished, and there is some reason to believe that the vineyards of Burgundy are as old as the age of the Antonines. In the beginning of the fourth century, the orator Eumenius speaks of the Vines in the territory of Autun, which were decayed through age, and the first plantation of which was totally unknown. It seems probable that the degenerate Romans might introduce the Vine into Britain, during their establishment in the island: at least there is little doubt that vineyards were common appendages to abbeys and monasteries, which were frequently filled with foreigners, to whom wine was a necessary article of diet. It is natural also to suppose that the propagation of the Vine would be first attempted in the southern parts of our island; accordingly the neighbourhood of Winchester was formerly famous for vineyards, and the very name of the city, Wine-chester, affords a strong corroboration. In the neighbourhood of Canterbury, Vines were common; and a large piece of ground adjoining to Rochester, is now called the Vine, as also is another at Sevenoaks. In Sussex, Essex, Middlesex, Cambridgeshire, Suffolk, Northamptonshire, Leicestershire, and even as far north as Darley Abbey, in the county of Derby, vineyards are known to have existed. Within the walls of the Metropolis, there is a street called the Vineyard; there is also a Vine-street Hatton Garden; and The Vineyards, by Houndsditch and Coldbath Fields. Hence we may fairly conclude, that there were many vineyards in England for several centuries since the Conquest; and the principal cause of their being at length neglected in this country, probably was, that better wine could be procured at a cheaper rate from the French provinces then in our possession; at the same time that the advancement of agriculture contributed to their being relinquished. Although, in favourable soils and situations, with proper management, our Vines will often produce abundance of such fruit as may yield good wine; still, from the variable nature of our climate, it appears impossible to attain this object upon a large scale. Nor is it desirable that our soil should be so occupied, while Portugal, Spain, Italy, and France, can so abundantly supply us with their delicious vintages, and will take our manufactures in return.—The Vine is not generally reputed to be a tree, though in its wild state it grows to a considerable size; but is rather a trailing shrub. It has, however, grown so large as to furnish bulk sufficient to make a statue of Jupiter, columns for a pagan temple, and planks for the doors of the great cathedral at Ravenna, which are twelve feet in height, and the planks fourteen and fifteen inches broad; these, however, were grown in a soil and climate celebrated for producing Vines of an enormous size, and the wood is of a very lasting nature. Those Vines which are pruned and dressed, seldom grow large, because the vigour of the stock is transfused into the branches, and there consumed in bearing fruit. In our climate, especially, we cannot expect to find many instances of its magnitude and longevity; though, in a genial soil and situation, it will attain an amazing size and expansion, even in this country. The most famous Vine, for the quantity of its produce, ever known in Great Britain, is in a grape-house on the south side of Hampton Court palace: it is of the Black Hamburgh kind, and occupies the whole house, which is seventy feet by fourteen. This was planted fifty years ago; the stem is about thirteen inches in girth, and the principal branch, having been trained back at the extremity of the house, is one hundred and fourteen feet in length. In one year this Vine has been known to produce two hundred bunches of grapes, each, on an average, weighing one pound.—The use of the fruit is so generally known, that it is unnecessary to enlarge upon it; we shall therefore only state the medical qualities. Verjuice is made of the unripe fruit, but that has been much superseded by the juice of lemons, though it is still employed externally in bruises and sprains. The dried fruit (raisins and currants) is used as an agreeable, lubricating, acescent sweet in pectoral decoctions, and for blunting the acrimony of other medicines, and rendering them grateful to the palate and stomach. The general effects of wine are to stimulate the stomach, exhilarate the spirits, warm the habit, quicken the circulation, and promote perspiration: but taken in too large quantities, it is but too well known to prove intoxicating and powerfully sedative. In many disorders it is admitted to be very serviceable, especially in typhus or putrid fevers, where it often proves of more immediate advantage than the Peruvian bark. Delirium, the consequence of excessive irritability and a defective state of nervous energy, is often removed by a free use of wine. In the putrid sore throat, in the small-pox, when attended with great debility and symptoms of putrescency, in gangrenes, and even in the plague, it is considered as a principal remedy; also in all cases of languor, and great prostration of strength, it is a more grateful and efficacious cordial than can be furnished from the whole class of aromatics. Vinegar, spirits of wine, and the very best kinds of brandy, are likewise obtained by different processes from this fruit, and the substance called tartar (of which the cream of tartar, so well known as a gentle purgative, is made) is only a salt of the grape, which sticks to the wine-casks; so that few vegetables furnish us with so great a number of medicines as the Vine. This tartar consists of the vegetable alkali supersaturated with acid, and is an officinal article. Crystals of tartar are in common use as a laxative and mild cathartic, and also in the dropsy, besides being employed in several officinal compositions. Vinegar is of great use in almost all inflammatory and putrid disorders; and is very efficacious in counteracting the effects of vegetable poisons. Inhaled in the form of a vapour, it is useful in the putrid sore throat, and is much employed as a menstruum for extracting the virtues of other medicines. The leaves and the tendrils having an astringent acid taste, were formerly used in diarrhœas, hæmorrhages, and other disorders requiring refrigerant and styptic medicines. The juice or sap has been recommended in calculous disorders; and is reputed to be an excellent application to weak eyes, and for specks of the cornea.—*Varieties of the Vine.* These are exceedingly numerous, and might be indefinitely increased, if more attention were paid to raising it from seed, which is seldom done, on account of the facility with which it may be propagated by other methods. The varieties noticed by Mr. Miller, are as follows: The *July Grape*, which is prin-

cipally esteemed for ripening early without fire-heat, has a sugary juice with little flavour; the berry is small, round, and black, growing loosely on numerous small bunches. The *Black Sweet Water*, which ripens soon after the preceding, and is fit for either a common wall or a vinery. The fruit is greedily devoured by birds and flies, and is very subject to crack. The skin is thin, and the juice very sweet; berry small, roundish, growing close in the bunches, which are short. The *White Sweet Water*, is an excellent grape for the wall, vinery, or hot-house; the juice is very agreeable, and the skin and flesh delicate. It often bears small berries among the larger ones. In some situations, on the side next the sun, the berries when most delicious are clouded with a russet colour. The *Royal Muscadine*, is fit for the hot-house and vinery; it is an excellent grape, the bunches are generally large, and have at the upper part two smaller side-bunches or shoulders: berries round, white, when perfectly ripe turning to an amber-colour: juice rich and vinous. They are of a moderate size, with a thick skin, and a juicy soft flesh. They ripen in September, but, if carefully preserved, will hang very late, and become excellent: the bunches sometimes weigh six or seven pounds. This Vine is very distinguishable, by the wood and foliage generally growing remarkably gross and strong. The *Cœur*, or *Frankindale Grape*, generally ripens well in England, upon a good-aspected wall: the berries resemble those of the black Muscadine, but are fleshy, with a slight musky flavour: they ripen in September. The *Black Cluster*, or *Meunier Grape*, so called from the hoary down of the leaves in summer: the bunches are short; the berries oval, and very close, so that many of the inner ones continue green, when those on the outside are perfectly ripe. It is a good fruit, and is here called the Burgundy Grape, and ripens well in September: the skin and flesh are delicate, and the juice sweet and pleasant: it is fit for a vinery or a common wall. The *True Burgundy Grape*, or *Black Morillon*, is one of the worst sorts for the table, but one of the best for making wine; berries oval, and hanging looser on the bunches than in the cluster. The *Corinth*, or *Currant Grape;* berry small, roundish, generally without stone, of a deep black colour, and much clustered on the short bunches: it has a sweet juice, and ripens in September. The *White Corinth Grape*, with a small round berry, thin-skinned, having a very delicate juicy flesh, of an agreeable flavour: the berries, when perfectly ripe, are so transparent that the seeds appear distinctly. The *White Muscadine*, is the best grape for a common wall, and it also is a great bearer, and fine eating when well matured. The *Black Frontinac*, ripens at the end of September or beginning of October; bunches short; berries round, of a good size, loose on the bunches, when fully ripe they are very black, and covered with a meal or flue like the Plum; the juice is very rich and vinous. The *Red Frontinac*, is a good sort for the vinery, as it rarely ripens without artificial heat in England. It has the most vinous liquor of all the sorts, for which it is greatly esteemed in France: the bunches are longer than those of the preceding sort; the berries are large and round; when fully ripe, of a brick colour, but when unripe gray, with a few dark stripes. The *White Frontinac*, is suitable for a common wall, vinery, or hot-house; the bunches are larger than either of the former Frontinacs; berries round, so closely clustered, that unless they are carefully thinned early in the season, they will not ripen, and the moisture will be detained in the autumn, causing them to rot: when ripe it is inferior to none, the juice is so excellent. The *Muscat of Alexandrina*, or *of Jerusalem*, is in great estimation, being more generally planted in hot-houses than any other sort. When perfectly ripe, the berries are of a fine amber colour, the skins thick, the pulp hard, and not very juicy, but of a high musky flavour: there are two sorts, one with white and the other with red berries; their juice is very rich and vinous, but it seldom ripens in England without artificial heat. The *Red Hamburgh*, sometimes called the Gibraltar Grape: the berries are inclined to oval, thin-skinned, dark red, with a juicy delicate flesh, that has a rich vinous flavour, of a moderate size; they ripen in large bunches at the end of October or in November. The *Black Hamburgh;* this ripens at the same time with the preceding, which it resembles, only being black; the skin is thick, and the pulp hard, but it is very much preferred because it is a good bearer, and yields a well-flavoured fruit. The *Malmsey Muscadine;* this is fit either for a wall or the vinery; the juice is very sweet and highly flavoured. The *Black Muscadine*, is very prolific, and makes a fine appearance, on account of its black berries being powdered with a bluish bloom; but the pulp is not so delicate and juicy as the white. The *White Muscat*, is a plentiful bearer, and highly esteemed for the hot-house or vinery; the berries are large and oval, when perfectly ripe of a fine amber colour, sometimes clouded with brown or russet, especially on the side next the sun; skin thin, and pulp delicate, full of vinous juice. The *Black Muscadel*, is fit for the hot-house; the berries are large, oval, and black, with a thin skin, and a delicate juicy flesh; the same bunch contains berries of different sizes, some of them very large and long, but somewhat compressed and flat at the ends; the leaves change to a beautiful scarlet in autumn. The *Red Muscadel;* this is a hot-house grape, and one of the latest ripe: the berries are large, oval, and of a beautiful red colour, with a thick skin, and hard flesh, something like the resin grape; the bunches are very elegantly formed of equal berries, and sometimes weigh six or seven pounds. The *Black Damascus*, is also a hot-house grape, large, of an excellent flavour, with a thick skin, and a delicate, rich, juicy pulp; the same bunch has commonly berries of different sizes; the small ones having no stones, and the largest having only one: it is a very valuable, but late sort. The *Black Tripoli*, is a very valuable late grape, nearly allied to the preceding, but the berries are all large and equal, with one stone in each. The *Black Spanish*, or *Alicant Grape;* this is proper for a hot-house and vinery, and is sometimes called the Lombardy Grape; berries inclining to an oval shape, moderately large, and black, on exceedingly long unshouldered bunches; skin thick, and the seeds uncommonly large; pulp juicy, and of an agreeable flavour; the leaves are, in autumn, beautifully variegated with red, green, and yellow: it affords the most excellent sort of Spanish wine. The *Black Lisbon*, is large, globular, black, thin-skinned, and juicy. It resembles the Black Hamburgh, and is fit for the hot-house and vinery. The *White Hamburgh*, sometimes called the Portugal Grape, is large, oval, with a thick skin, and hard flesh. It is a plentiful bearer, and forms large bunches, but it is not so valuable as the Black or Red Hamburgh. The *Large Black Cluster:* berries large, and more oval than the small, with a juice of a harsh rough taste. This is said to be the grape from which Port wine is made. It is a proper sort for the vinery. The *White Morillon* is oval, of a moderate size; has a delicate juicy pulp, and grows close upon small bunches. It appears to be nearly allied to the genuine Tokay Grape. The *Early White Teneriffe Grape*, resembles the Common Muscadine: the berries are round, middle-sized, with a thin skin, and delicate juicy pulp, of an extraordinary sweetness: it is fit for the wall or vinery. The *Aleppo Grape*, is middle-

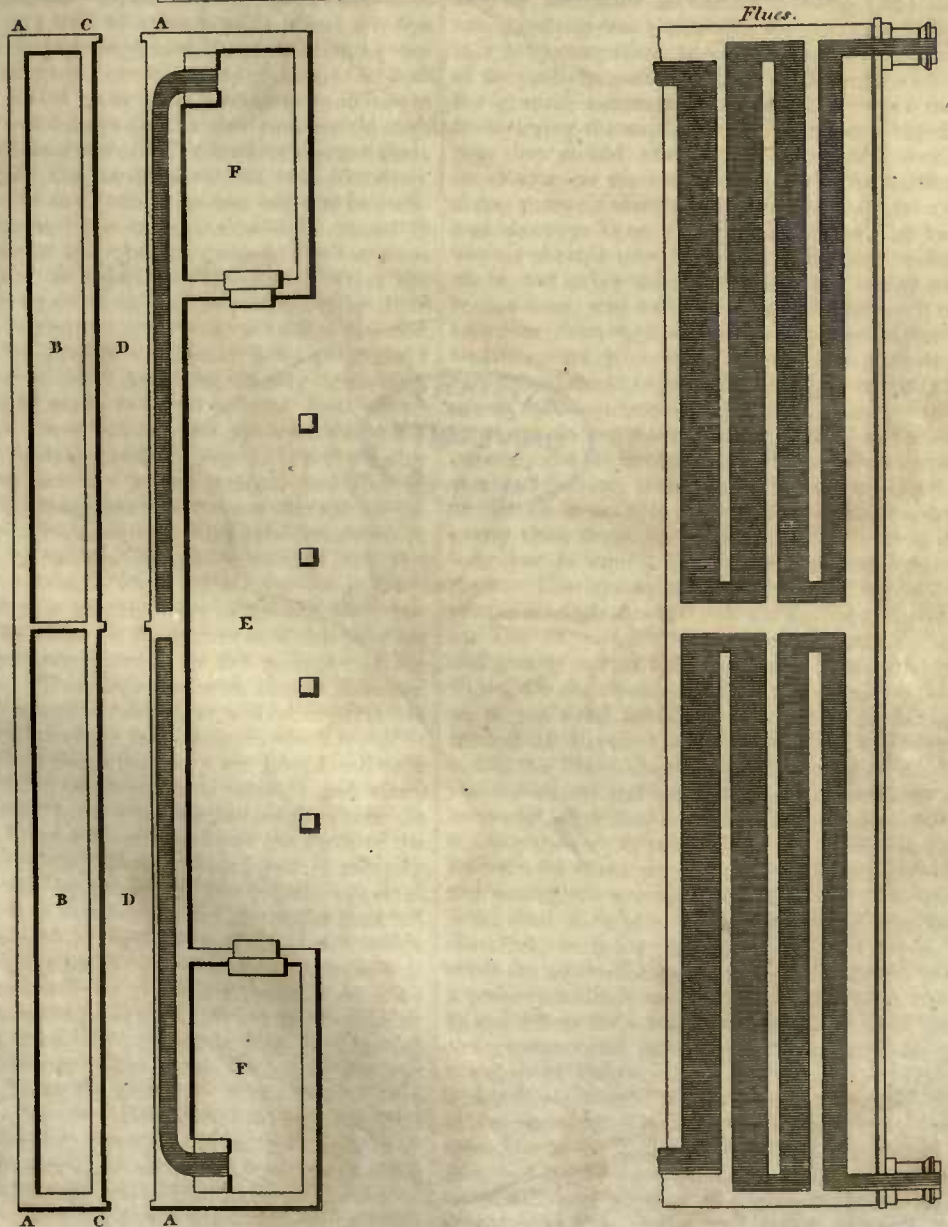
sized, roundish, with a thin skin and delicate juicy flesh, of an exquisite vinous flavour: the colour is various, white, black, but the major part striped in the same bunch; sometimes one half is white, and the other half black, and the colours never intermix, but are divided by straight lines. In autumn the leaves are very curiously striped with green and yellow, somewhat similar to the Aleppo Lettuce. The *Red Syracusan Grape*, a very fine hot-house sort, is not very well known in England: the berries are very large, oval, somewhat irregularly formed, hanging loosely on the bunches, which are pretty large. The *Morocco Grape*, is scarce and much esteemed: the pedicels are short, and singularly large; the berries are large, somewhat heart-shaped, of a tawny grizzly colour, it is often unequally sized, never containing more than one seed, and the small ones have none. The *Black Raisin Grape*, is large, oval, with a thick skin and a firm flesh: it forms long handsome bunches. The *White Raisin Grape*, resembles the preceding, and only differs in the whiteness of the berries. There are two ways of curing these grapes, first by cutting the stalk of the bunches half through, when they are almost ripe, and leaving them suspended on the Vine by their stalks; in this state the sun candies them, and when they are dry they are packed up in boxes for exportation. The second process is, when the Vines are pruned the tendrils are preserved till the time of the vintage, when a great fire is made, wherein the tendrils are burnt, and the newly gathered Grapes are dipt in the lye made of their ashes, after which they are exposed to the sun to dry. The *Malvoise*, or *Blue Tokay Grape*, is small, inclining to oval, brown, powdered with a blue bloom; skin thin, and flesh delicate, full of a vinous juice. It bears well, and is extremely rich and highly flavoured, though the berry is small: it ripens early, and is so full of juice that it is esteemed the most melting of all the sorts. The *Genuine Tokay*, was imported from Hungary, and is fit for the hot-house and vinery; the berries are white, inclining to oval, rather close on the bunch, which is of a moderate size; skin thin, and pulp delicate, abounding with agreeable juice; the leaves on the under side are covered with a fine soft down, like satin. The *Lombardy Grape*, is large, inclining to oval, and of a beautiful flame colour; the bunches are regularly formed with shoulders, and frequently weigh six or seven pounds: it will suit the hot-house or vinery. Some call it the Rhenish Grape, and others the Flame-coloured Tokay: the leaves are much divided, and their upper surface is of a deep green colour. The *Smyrna Grape*, is but little known in this country, though a good Grape, and fit for the hot-house and vinery: the berry is large, red, oval, with a thin skin and delicate juicy flesh, on long bunches, with loosely connected shoulders; the leaves in autumn have purple edges. The *Brick Grape*, is not much esteemed, though very sweet; it is small, inclining to oval, of a pale red or brick colour, growing close on the bunch, which is very small. The *Claret Grape*, is small, black, inclining to oval, growing close, in small bunches; the juice is blood-red, of a harsh taste, excepting the Grapes are perfectly matured, when it may be considered as an agreeable delicate fruit; the leaves change to a russet-red early in summer, and to a deep-red in autumn. This sort is proper for the hot-house or vinery. The *Syrian Grape*, is white, large, oval, with a thick skin, and a firm hard flesh, on well-formed but enormously large bunches. It is very prolific, and when well perfected is a very eatable fruit; it may also be kept without difficulty many weeks longer than any other sort: it may be had in perfection from the hot-house in January, and sometimes in February. This is supposed to be the sort of Grape which the twelve spies, who were sent by Moses to view the land of Canaan, cut down by the brook Eshcol, (Numb. xiv. 23.) and bare it between two upon a staff. How large the bunch might be, we are not told; but Strabo testifies, that the Vines in Margiana, and other places, were so big, that two men could scarcely compass them with their arms, and that they produced bunches of Grapes a yard long. And Huetius informs us, that Crete, Chios, and other islands of the Archipelago, afford bunches of ten, and sometimes of thirty-six or forty pounds weight. Even in this country a bunch of the Syrian Grape was produced at Wellbeck, under the care of Mr. Speechly, which weighed nineteen pounds and a half. Ignorant persons, judging from the ordinary size of a bunch of Grapes, have attempted to throw ridicule upon the circumstance of conveying a single bunch between two men. Supposing the branch, with its cluster, to have weighed forty or fifty pounds, it might certainly have been carried by one man; but as it was to be exhibited to the people, it was judicious, in order to preserve the fruit whole and unbruised, to carry it in the manner related. Accordingly, when the late Duke of Portland sent his large cluster to the Marquis of Rockingham as a present, it was conveyed to Wentworth house, a distance of more than twenty miles, by four labourers, who carried it by turns in pairs, suspended on a staff, in the same way as the Israelites bore that which they brought as a specimen of the produce of the Promised Land. The greatest diameter of the Duke of Portland's cluster was nineteen inches and a half, its circumference five feet and a half, and its length twenty-one inches and three quarters. The *Cat's Grape*, is fit for the hot-house or vinery, but tastes very unpleasantly, unless perfectly ripe, when it is very sweet: the berries are small, oval, and greenish-white, with a thin skin, and soft juicy pulp, growing close on small bunches. The *Damson Grape*, is a hot-house sort, large, oval, of a beautiful purple colour, growing loosely on large bunches; leaves large, thick, and succulent, having something of the appearance of green leather. The *Greek Grape*, is a delicate fruit, justly esteemed, of a moderate size, and forming handsome bunches; the leaves grow on very short footstalks, and bear a resemblance to those of the Sweet Water. The *Cornichon*, has white berries, with a thick skin, and a firm sweet flesh. Their shape is remarkable, tapering from the stalk, but not in a regular manner, and ending in a blunt point, somewhat like the long end of a small fish's bladder. This is fit for the hot-house. The *New Muscat of Jerusalem*, is large, round, red, and of the size of a gooseberry in fine seasons; but as it does not ripen well on a wall in this country, it might be worth while to try it in a hot-house or vinery. The *Black Prince*, ripens in October, and hangs till the middle of November; the berries are large, as also are the bunches, which upon walls, in a favourable season, weigh a pound and a half, hence it well deserves a place in the hot-house and vinery. The *White Constantia*, from which, and the *Red Constantia*, the famous Constantia wine, so called from a place near the Cape of Good Hope, is made. It, however, appears that these Vines, when transplanted to a small distance from that spot, produce a very inferior wine. The situation of the place is rather low, but more elevated than other parts of the district, and the soil is a light sandy loam.—The select Vines for a wall, are the White Muscadine, the White Sweet-water, the Large and Small Black Cluster; and the St. Peter's and Black Hamburgh, which will do very well in favourable seasons.——*Propagation and Culture.* All the sorts of Grapes are propagated either from layers, or cuttings, the former of which is greatly practised in England, but the latter is what we

would recommend, as being much preferable to the other; for the roots of Vines do not grow strong and woody, as in most sorts of trees, but are long, slender, and pliable; therefore when they are taken out of the ground, they seldom strike out any fibres from their weak roots, which generally shrivel and dry; so that they rather retard than help the plants in their growth, by preventing the new fibres from pushing out; for which reason rather plant a good cutting than a rooted plant, provided it be well chosen, and there is little danger of its not growing. You should always make choice of such shoots as are strong, and well ripened, of the last year's growth; these should be cut from the old Vine, just below the place where they were produced, taking a knot or piece of the two-years' wood to each, which should be pruned smooth; then you should cut off the upper part of the shoots, so as to leave the cutting about sixteen inches long. When the piece or knot of old wood is cut at both ends near the young shoot, the cutting will resemble a little mallet. In making the cuttings after this manner, there can be but one taken from each shoot; whereas most persons cut them into lengths of about a foot, and plant them all, which is very wrong; for the upper part of the shoots is never so well ripened as the lower, which was produced early in the spring, and has had the whole summer to harden, so that if they take root, they never make so good plants; for the wood of those cuttings being spongy and soft, admits the moisture too freely, whereby the plants will be luxuriant in growth, but never so fruitful as such whose wood is closer and more compact. When the cuttings are thus prepared, if they are not then planted, they should be placed with their lower part in the ground in a dry soil, laying some litter upon their upper parts to prevent them from drying: in this situation they may remain till the beginning of April, (which is the best time for planting them,) when you should take them out, and wash them from the filth they have contracted; and if you find them very dry, you should let them stand with their lower parts in water six or eight hours, which will distend their vessels, and dispose them for taking root. Then the ground being before prepared where the plants are designed to remain, (whether against walls, or for standards, for they should not be removed again,) the cuttings should be planted; but in preparing the ground, you should consider the nature of the soil, which, if strong, and inclinable to wet, is by no means proper for Grapes; therefore where it so happens, you should open a trench where the cuttings are to be planted, which should be filled with lime rubbish, the better to drain off the moisture; then raise the border with fresh light earth about two feet thick, so that it may be at least a foot above the level of the ground, then you should open the holes at about six feet distance from each other, putting one good strong cutting into each hole, which should be laid a little sloping, that their tops may incline to the wall, but it must be put in so deep, as that the uppermost eye may be level with the surface of the ground; for when any part of the cutting is left above ground, as is the common method used by the English gardeners, most of the buds attempt to shoot: so that the strength of the cuttings are divided to nourish so many shoots, which must consequently be weaker than if only one of them grew; whereas, on the contrary, by burying the whole cutting in the ground, the sap is all employed on one single shoot, which consequently will be much stronger; besides, the sun and air are apt to dry that part of the cutting which remains above ground, and so often prevents their buds from shooting. Then having placed the cutting into the ground, you should fill up the hole gently, pressing down the earth with your foot close about it, and raise a little hill just upon the top of the cutting, to cover the upper eye quite over, which will prevent it from drying; this being done, there is nothing more necessary, but to keep the ground clear from weeds until the cuttings begin to shoot; at which time you should look over them carefully to rub off any small shoots, if such are produced, fastening only the first main shoot to the wall, which should be constantly trained up, as it is extended in length to prevent its breaking or hanging down; you must continue to look over these once in about three weeks during the summer season, constantly rubbing off all lateral shoots which are produced, leaving only the first main shoot; and be sure to keep the ground constantly clear from weeds, which, if suffered to grow, will exhaust the goodness of the soil, and starve the cuttings. The Michaelmas following, if your cuttings have produced strong shoots, you should prune them down to two eyes, which, though by some people may be thought too short, yet I am satisfied, from several experiments, to be the best method. The reason for advising the pruning Vines at this season, rather than deferring it till the spring, is, because the tender parts of those young shoots, if left on, are subject to decay in winter, for they are apt to grow late in the year, so the tops of their shoots are tender, and the early frosts will pinch them, and then they frequently are killed down to a considerable length, which weakens their roots; but if they are cut off early in autumn, the wounds will heal over before the bad weather, and thereby the roots will be greatly strengthened. In the spring, after the cold weather is past, you must gently dig up the borders to loosen the earth; but you must be very careful in doing this, not to injure the roots of your Vines; you should also raise the earth up to the stems of the plants, so as to cover the old wood, but not so deep as to cover either of the eyes of the last year's wood. After this they will require no farther care until they begin to shoot, when you should look over them carefully, to rub off all weak dangling shoots, leaving no more than one or two shoots, which are produced from the eyes of the last year's wood, which should be fastened to the wall; and from this time, until the Vines have done shooting, you should look them over once in three weeks or a month, to rub off all lateral shoots as they are produced, and to fasten the main shoots to the wall as they are extended in length, which must not be shortened before the middle or latter end of July, when it will be proper to nip off their tops, which will strengthen the lower eyes; and during the summer season, you must constantly keep the ground clear from weeds; nor should you permit any sorts of plants to grow near the Vines, which would not only rob them of nourishment, but shade the lower part of the shoots, and thereby prevent their ripening, which will not only cause their wood to be spongy and luxuriant, but render it less fruitful. As soon as the leaves begin to drop in autumn, you should prune these young Vines again, leaving three buds to each of the shoots, provided they are strong, otherwise it is better to shorten them down to two eyes if they are good; for it is a very wrong practice to leave much wood upon young Vines, or to leave their shoots too long, which greatly weakens the roots; then you should fasten them to the wall, spreading them out horizontally each way, that there may be room to train the new shoots the following summer, and in the spring dig the borders as before. The third season you must go over the Vines again as soon as they begin to shoot, to rub off all danglers, as before, and train the strong shoots in their proper places, which this year may be supposed to be two from each shoot of the last year's wood; but if they attempt to produce two shoots from one eye, the weakest of them must be rubbed

off, for there should never be more than one allowed to come out of each eye. If any of them produce fruit, as many times they will the third year, you should not stop them so soon as is generally practised upon the bearing shoots of old Vines, but permit them to shoot forward till a month after Midsummer, at which time you may pinch off the tops of the shoots; for if this were done too soon, it would spoil the buds for the next year's wood, which in young Vines must be more carefully preserved than on older plants, because there are no other shoots to be laid in for a supply of wood, as is commonly practised on old Vines. During the summer you must constantly go over your Vines, and displace all weak lateral shoots as they are produced, and carefully keep the ground clear from weeds, as was before directed, that the shoots may ripen well; which is a material thing to be observed in most sorts of fruit-trees, but especially in Vines, which seldom produce any fruit from immature branches. These things being duly observed, are all that is necessary in the management of young Vines: we therefore proceed to lay down rules for the government of grown Vines, which is as follows. First, Vines rarely produce any bearing shoots from wood that is more than one year old, therefore great care should be taken to have such wood in every part of the trees; for the fruit are always produced upon the shoots of the same year, which come out from buds of the last year's wood. The method commonly practised by the gardeners in England is, to shorten the branches of the former year's growth, down to three or four eyes, at the time of pruning; though there are some persons who leave these shoots much longer, and affirm that by this practice they obtain a greater quantity of fruit; but however this may be, it is a very wrong practice, since it is impossible that one shoot can nourish forty or fifty bunches of Grapes, so well as it can ten or twelve; so that what is gotten in number, is lost in their magnitude; besides, the greater quantity of fruit there is left on Vines, the later they are ripened, and their juice is not so rich. Wherefore the best method is, to shorten the bearing shoots to about four eyes in length, because the lowermost seldom is good, and three buds are sufficient, for each of these will produce a shoot, which generally has two or three bunches of Grapes; so that from each of those shoots there may be expected six or eight bunches, which is a sufficient quantity. These shoots must be laid about eighteen inches asunder, for if they are closer, when the side-shoots are produced, there will not be room enough to train them against the wall, which should always be provided for; and as their leaves are very large, the branches should be left at a proportionable distance from each other, that they may not crowd or shade the fruit. At the winter pruning of your Vines, you should always observe to make the cut just above the eye, sloping it backward from it, that if it should bleed, the sap might not flow upon the bud; and where there is an opportunity of cutting down some young shoots to two eyes, in order to produce vigorous shoots for the next year's bearing, it should always be done, because in stopping of those shoots which have fruit upon them as soon as the Grapes are formed, which is frequently practised, it often spoils the eyes for producing bearing branches the following year, and this reserving of new wood is what the vignerons abroad always practise in their vineyards. The best season for pruning of Vines is the end of October, for the reasons before laid down. The latter end of April, or the beginning of May, when the Vines begin to shoot, you must carefully look them over, rubbing off all small buds which may come from the old wood, which only produce weak dangling branches; as also when two shoots are produced from the same bud, the weakest of them should be displaced, which will cause the others to be stronger; and the sooner this is done, the better it is for the Vines. In the middle of May you must go over them again, rubbing off all the dangling shoots as before, and at the same time you must fasten up all the strong branches, so that they may not hang from the wall; for if their shoots hang down, their leaves will be turned with their upper surfaces the wrong way, and when the shoots are afterwards trained upright, they will have their under surface upward; and until the leaves are turned again, and have taken their right position, the fruit will not thrive; so that the not observing this management, will cause the Grapes to be a fortnight or three weeks later before they ripen; besides, by suffering the fruit to hang from the wall, and be shaded with the closeness of the branches, it is greatly retarded in its growth; therefore during the growing season you should constantly look over the Vines, displacing all dangling branches and wild wood, and fasten up the other shoots regularly to the wall, as they are extended in length; and towards the middle of June you should stop the bearing branches, which will strengthen the fruit, provided you always leave three eyes above the bunches; for if you stop them too soon, it will injure the fruit, by taking away that part of the branch which is necessary to attract the nourishment to the fruit, as also to perspire off the crudities of the sap, which is not proper for the fruit to receive. But although it be necessary to stop those shoots which have fruit at this season, yet this is not to be practised upon those which are intended for bearing the next year, for these must not be stopped before the middle of July, lest, by stopping them too soon, you cause the eyes to shoot out strong lateral branches, whereby they will be greatly injured. During the summer season you should be very careful to rub off all dangling branches, and train up the shoots regularly to the wall as before, which will greatly accelerate the growth of the fruit, and also admit the sun and air to them, which is absolutely necessary to ripen and give the fruit a rich flavour: but you must never divest the branches of their leaves, as is the practice of some persons; for although the admitting of the sun must be necessary to ripen them, yet if they are too much exposed thereto, their skins will be tough, and it will retard their ripening; besides, the leaves being absolutely necessary to nourish the fruit, by taking them off, the fruit is starved, and seldom comes to any size. When it is all gathered, you should prune the Vines, whereby the litter of their leaves will be entirely removed at once, and their fruit will be the forwarder the succeeding year.—Further directions will be found at pp. 767, and 768. *Method of managing Vines against flued or hot-walls, commonly called Vineries or Grape Houses.* A Vinery or Grape House consists of walls twelve or fourteen feet high, running from east to west, furnished with stoves and proper flues, with a roof and lights of glass covering a border of about ten feet in width. (See the engraved Elevation, Section, and Ground Plan; also the articles *Hot-house* and *Stove*.) Where Vines are intended to be forced at an early season, it is usual to have upright glasses, two and a half or three feet high in front, to support the roof, to admit sun and light to the border, which is generally occupied by low-growing vegetables; but where Grapes are wanted early, a low wall in front will answer as well. Supposing the wall to be twelve feet high, the breadth of the border ten feet, and the height of the upright wall in front three feet, the roof will then form an angle of about 43°; which experience shews to be a proper pitch for forcing Vines after the vernal equinox. A Grape House may also be constructed on a plan similar to

A Double Vinery.

See Vitis, p. 762.



A. *Front and Back Walls.*

B. *Pits for a Crop of Figs or Peaches, in Pots, and Mushrooms under them. To be filled with fresh Dung at the beginning of forcing the Vines; which will be of essential service to the Vines, and ensure a crop.*

C. *Stone Parapet.*

D. *Border for the Vines to run in.*

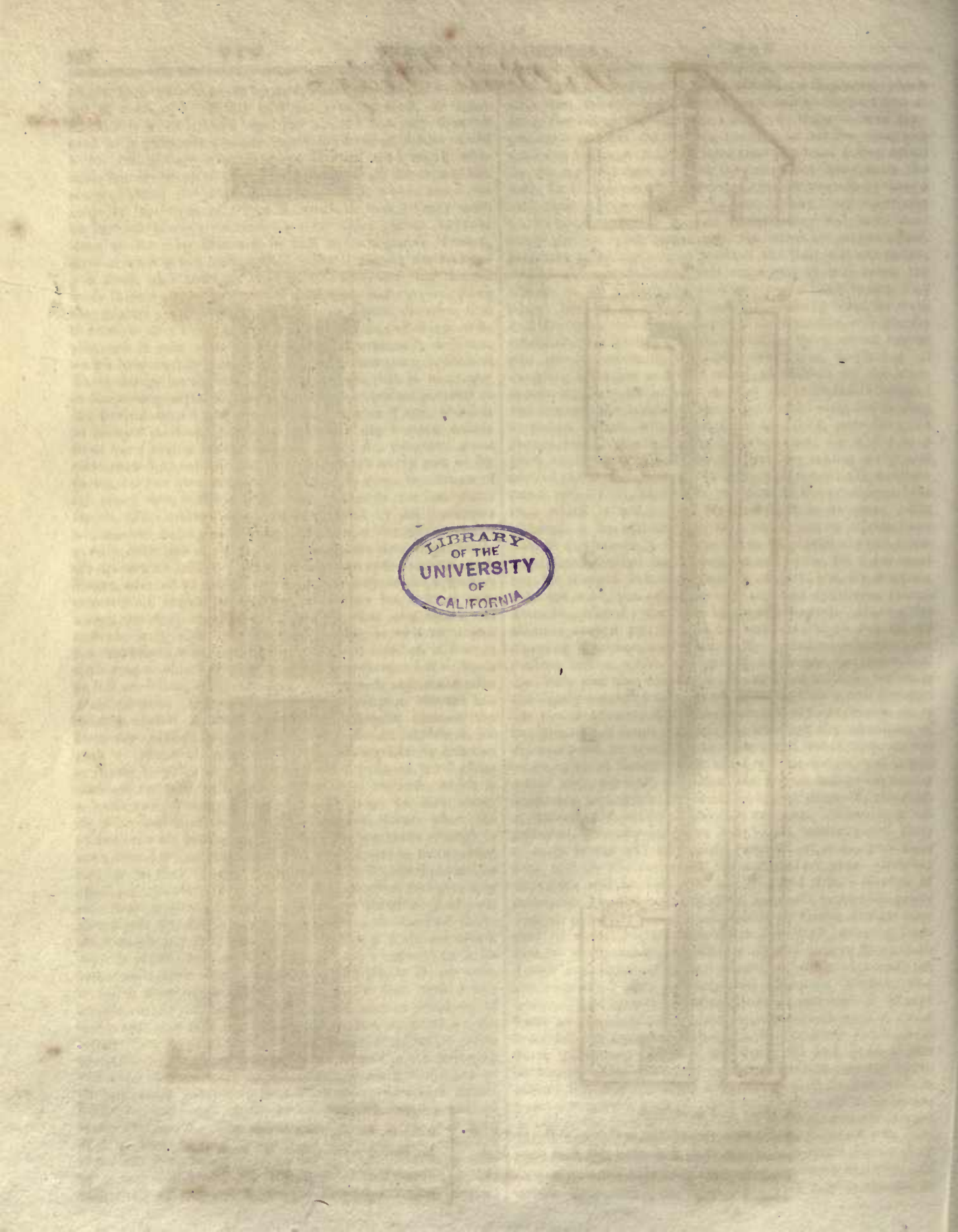
The Fruit to grow against the Back Wall.

Grapes fit for cutting in April and May.

E. *Open Shed behind the Vinery.* F. *Fire Houses.*

W. Mallinson &c.

Published by Henry Fisher, Caxton, London, 1825.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that of a single-pitted Pine-stove. The back wall fourteen feet high; the roof slanting, and covering an extent of about sixteen feet; and a flue running from east to west near the front wall. Such a building is well calculated not only for Grapes, but for early crops of Melons, Strawberries, &c. Glass being the principal article of expense in forcing fruit; where there is a Peach-house, the glass-frames may serve both for that and the Vinery, provided the buildings are constructed of the same dimensions; for as Peaches do not require to be covered with glass later than the middle of summer, a crop of Grapes may be got by means of the same glasses after that season. Good crops of Grapes may also be obtained from Vines trained against walls about six feet high, by means of Melon-frame glasses, if a small slanting roof is made of proper dimensions to receive the glasses. A small degree of fire-heat would be of great advantage, and might be applied either by a flued wall, the flue running through the house, or by cast-iron pipes. The borders against these hot walls should have the earth taken out two feet deep, (provided the ground is dry,) otherwise one foot will be sufficient, because in wet land the borders should be raised at least two feet above the level of the ground, that the roots of the Vines may not be injured by the wet. When the earth is taken out, the bottom of the trench should be filled with stones, lime rubbish, &c. a foot and a half or two feet thick, which should be levelled and beaten down pretty hard to prevent the roots of the Vines from running downward. The trenches should be made five feet wide at least, otherwise the roots of the Vines will in a few years extend themselves beyond the rubbish, and finding an easy passage downwards, will run into the moist ground, and thereby imbibe so much wet, as to lessen the vinous flavour of the Grapes; but before the rubbish is filled into the trench, it is a better method to raise a nine-inch wall, at five feet distance from the hot-wall, which will keep the rubbish from intermixing with the neighbouring earth. and also confine the roots of the Vines to the border in which they are planted, so that they cannot reach to the moisture of the ground about them. This nine-inch wall should be raised to the height of the intended border, so will be of great use to lay the plate of timber of the frames upon, which it will be necessary to cover the Vines when they are forced, whereby the timbers will be better preserved from rotting; and where the borders are raised to any considerable height above the level of the ground, these walls will preserve the earth of the borders from falling down into the walks; but in carrying up these walls, it will be proper to leave little openings about eight or ten feet distance, to let the water pass off, because when the rubbish at the bottom of the trench unites and binds very hard, the water cannot easily find a passage through it; therefore it will be the better method to leave these small passages in the front wall, lest the moisture being confined at bottom, should be pent up as in a ditch, which will be of ill consequence to the Vines, but these openings should be two feet below the surface. When the walls are finished and thoroughly dry, the rubbish should be filled in, as before directed; then there should be fresh light earth laid upon it two feet thick, which will be a sufficient depth of soil for the Vines to root in. These borders should be thus prepared at least a month or six weeks before the Vines are planted, that they may have time to settle. The best time to plant them is about the end of March, or the beginning of April, according as the season proves early or late. These should be planted with cuttings rather than rooted plants, for the reasons before assigned, but there should be two cuttings put into each hole, or placed at a nearer distance, lest any of them should fail; for if all should succeed, the weakest of them may be easily drawn out the following spring. These cuttings should be well chosen from good bearing Vines, and the shoots should be well ripened, otherwise they will never make good plants. The distance these Vines should be allowed to remain is the same as for common walls, i. e. about six feet. In planting them there should be holes opened with a spade, about fourteen or fifteen inches deep, for if there be but three or four inches of good earth under the foot of the cuttings it will be sufficient; then the cuttings should be laid in the holes a little sloping, afterward the earth should be filled into the holes, and gently pressed with the foot to the cuttings, and raised in a heap over them, so as just to cover the uppermost eyes of the cuttings; afterward lay a little mulch on the surface of the ground about the cuttings, to prevent the sun and air from drying the earth, and if the spring should prove very dry, they should have some water once a week, which will be as often as the cuttings require it, for nothing will destroy them sooner than too much water, which rots their bark, and destroys them. In pruning Vines, the best method is, not to shorten the shoots from which the cuttings are to be made, but to lay their ends just into the ground, about two inches deep, and so leave them at full length, only observing to cover them with dry litter or pease-haulm in frosty dry weather, though in moist weather the covering should not remain on, because it would make the cuttings grow mouldy, which would greatly injure them. Then in the spring, when they are to be planted, they should be taken out of the ground, and their upper part cut off, so as to reduce them to about fourteen inches in length, according to the distance of the buds or eyes; for those cuttings whose buds grow pretty close together, need not be left more than one foot long, but in others fourteen or sixteen inches will be full short. The leaving the upper part of the shoots on all the winter is of great service to the cuttings, because when they are cut off in autumn, the air penetrates the wounded part, and greatly injures the other eyes. The management of these Vines, for the three first years after planting, being the same as is practised for those against common walls, is fully treated of already; only observe, that during these three years, the Vines should be encouraged as much as possible, and the shoots not left too long, nor too many in number on each root, that they may be duly ripened and prepared for bearing the fourth year, which is the soonest they should be forced; for when any sorts of fruit-trees are forced by fire too young, they seldom continue long in health, so that what fruit they produce is small, and not well-flavoured; therefore, in being over hasty to save a year or two, very often the whole design miscarries; for unless the trees are in a proper condition to bear much fruit, it is not worth while to make fires for a small quantity of starved ill-tasted fruit, the expense and trouble being the same for ten or twelve bunches of Grapes, as it will be for a hundred or more. These Vines should not be forced every year, but with good management they may be forced every other year, though it would be better if it were done only every third year; therefore, in order to have a supply of fruit annually, there should be a sufficient quantity of walling built to contain as many Vines as will be necessary for two or three years, and by making the frames in front moveable, they may be shifted from one part of the wall to another, as the Vines are alternately forced; therefore forty feet length of walling each year is as much as one fire will heat; and when the Vines are in full bearing, will supply a reasonable quantity of Grapes for a middling family; but for great families, twice

this length will not be too much. In most places where these hot-walls have been built, they are commonly planted with early kinds of Grapes, in order to have them early in the season; but this is hardly worth the trouble, for it is but of little consequence to have a few Grapes earlier by a month or six weeks, than those against common walls; therefore whenever a person is willing to be at the expense of these walls, they should be planted with some of the best kinds of Grapes, which rarely come to any perfection in this country without the assistance of some artificial heat, of which the following sorts are the most valuable: The Red Muscat of Alexandria, the White Muscat of Alexandria, the Red Frontinac, the White Frontinac, the Black Frontinac. When the Vines which are planted against the hot-walls are grown to full bearing, they must be pruned and managed after the same manner as hath been directed for those against common walls, with this difference only, viz. that those seasons when they are not forced, the Vines should be carefully managed in the summer for a supply of good wood, against the time of their being forced, so that it will be the better method to divest the Vines of their fruit, in order to encourage the wood; for as few of the sorts will ripen without heat, it is not worth while to leave them on the Vines during the season of resting, except it be the Common Frontinacs, which in a good season will ripen without artificial heat, but even on these many Grapes should not be left during the years of their resting; because as the design of this is to encourage and strengthen them, therefore all possible care should be had that the young wood is not robbed by overbearing; for those years when the Vines are forced, the joints of the young wood are generally drawn farther asunder than they ordinarily grow in the open air; so that when they are forced two or three years successively, the Vines are so much exhausted, as not to be recovered into a good bearing state for some years, especially if they are forced early in the season; or, where great care is not taken in the summer to let them have a proper share of free air, to prevent their being drawn too much, and also to ripen their shoots. Those years when the Vines are forced, the only care should be to encourage the fruit, without having much regard to the wood, so that every shoot should be pruned for fruit, and none of them shortened for a supply of young wood, because they have been so managed by pruning in the years of their resting, as to replenish the Vines with new wood. Those Vines which are designed for forcing in the spring, should be pruned early the autumn before, that the buds which are left on the shoots may receive all possible nourishment from the root, and at the same time the shoots should be fastened to the trellis in the order they are to lie; but the glasses should not be placed before the Vines till about the middle or end of January, at which time also the fires must be lighted, for if they are forced too early in the year, they will begin to shoot before the weather will be warm enough to admit air to the Vines, which will cause the young shoots to draw out weak, and thereby their joints will be too far asunder, consequently there will be fewer Grapes on them, and those bunches which are produced will be smaller than when they have a sufficient quantity of air admitted to them every day. If the fires are made at the time before directed, the Vines will begin to shoot the middle or latter end of February, which will be six weeks earlier than they usually come out against the common walls, so that by the time the other Vines are shooting, these will be in flower, which will be early enough to ripen any of these sorts of Grapes perfectly well. The fires should not be made very strong in these walls, for if the air is heated to about ten degrees above the temperate point on the botanical thermometers, it will be sufficiently warm to force out the shoots leisurely, which is much better than to force them violently. These fires should not be continued all the day-time, unless the weather should prove very cold, and the sun does not shine to warm the air, at which times it will be proper to have small fires continued all the day; for where the walls are rightly contrived, a moderate fire made every evening, and continued till ten or eleven of the clock at night, will heat the wall, and warm the enclosed air to a proper temperature; and as these fires need not be continued longer than about the end of April, (unless the spring should prove very cold,) the expense of fuel will not be very great, because they may be contrived to burn coal, wood, turf, or almost any other sort of fuel; though where coal is to be had reasonable, it makes the evenest and best fires, and will not require so much attendance. When the Vines begin to shoot, they must be frequently looked over to fasten the new shoots to the trellis, and rub off all dangling shoots; in doing of which great care must be taken, for the shoots of these forced Vines are very tender, and very subject to break when any violence is offered. The shoots should also be trained very regular, so as to lie as near as possible to the espalier, and at equal distances, that they may equally enjoy the benefit of the air and sun, which is absolutely necessary for the improvement of the fruit. When the Grapes are formed, the shoots should be stopped at the second joint beyond the fruit, that the nourishment may not be drawn away from the fruit in useless shoots, which must be avoided as much as possible in these forced Vines; upon which no useless wood should be left, which will shade the fruit, and exclude the air from it by their leaves. As the season advances and the weather becomes warm, there should be a proportionable share of free air admitted to the Vines every day, which is absolutely necessary to promote the growth of the fruit; but the glasses should be shut close every night, unless in very hot weather, otherwise the cold dews in the night will retard it. The bunches of the White Frontinac should also be carefully looked over, and the small Grapes cut out with very narrow-pointed scissars, in order to thin them, for these berries grow so close together on the bunches, that the moisture is detained between them, which often occasions their rotting; and the air being excluded from the middle of the bunches, the Grapes never ripen equally, which by this method may be remedied, if done in time; and as these Grapes are protected by the glasses from the blights which frequently take those which are exposed, there will be no hazard in thinning these Grapes soon after they are set, at which time it will be much easier to perform this operation, than when the Grapes are grown larger, and consequently will be closer together; but in doing this the bunches must not be roughly handled, for if the Grapes are the least bruised, or the bloom which there naturally is upon them, be rubbed off, their skins will harden, and turn of a brown colour, so that the fruit will never thrive after; therefore the scissars which are used for this purpose should have very narrow points, that they may be more easily put between the Grapes without injuring the remaining ones. The other sorts of Grapes which I have recommended for these hot-walls, not producing their fruit so close together on the branches, they will not require this operation, unless by any accident they should receive a blight, which often occasions a great inequality in the size of the Grapes; which, whenever it thus happens, will require to be remedied by cutting off the small Grapes, that the bunches may ripen equally, and appear more sightly. By the middle of June these Grapes will be almost full grown,

therefore the glasses may be kept off continually in the day-time, unless the season should prove very cold and wet, in which case they must be kept on, and only opened when the weather is favourable; for as the racy vinous flavour of these fruits is increased by a free air, so during the time of their ripening, they should have as large a share as the season will admit to be given them. Before the Grapes begin to ripen, they must be carefully guarded against birds, wasps, and other insects, otherwise they will be destroyed in a short time; to prevent which, the Vines should be carefully covered with nets so as to exclude the birds, who make great havock with the Grapes, by breaking their skins; and if there are a few twigs, covered with birdlime, placed here and there on the outside of the nets, it will be of service, because the birds are often so bold as to attempt to break the nets to get to the Grapes; which, if they attempt, they may be so entangled on these twigs, as not to get loose; and whenever that happens, they should not be disengaged, but suffered to remain to keep off their companions; and if they get off themselves, it will have the desired effect, for there will few other birds come to the same place that season. As to the wasps, the best method is to hang up some phials about half filled with sugared water, and rub the necks of the phials with a little honey, which will draw all the wasps and flies to them, which, by attempting to get at the liquor, will fall into the phials and be drowned; these phials should be carefully looked over once in three or four days, to take out the wasps and destroy them, and to replenish the phials with liquor. If this be duly observed, and the phials placed in time, before the Grapes are attacked, it will effectually prevent their being injured; but where these precautions are not taken, the Grapes will be in danger of being absolutely destroyed; for as these early Grapes will ripen long before any others against common walls, they will be in much more danger, there being no other fruit for them at that season in the neighbourhood; whereas when Grapes in general begin to ripen, there is a quantity in almost every garden; so that if they destroy a part in each garden, yet there will be a greater chance to have some escape, than where there is only one wall for them to attack. These sorts of Grapes being forced in the manner before directed, will begin to ripen early in August, especially the Black and Red Frontinacs, which will be fit for the table a fortnight earlier than the other sorts; but as the design of forcing them is to have them in as great perfection as possible in this climate, they should not be gathered until they are thorough ripe, for which reason some of the latter sorts should be left on the Vines till September; but then the glasses should be kept over them in wet and cold weather, to protect the fruit from it, but whenever the weather is fair, the glasses must be opened to let in the free air, otherwise the damps, arising from the earth at that season, will cause a mouldiness upon the Grapes, which will rot them; so that if the season should prove very cold and wet while the fruit is upon the Vines, it will be proper to make a small fire every night to dry off the damps, and prevent this injury. Most people in England gather their Grapes too soon, never suffering them to remain on the Vines to ripen perfectly, even in the warmest seasons, when, if they are left on till after Michaelmas, they will be good.

Directions for the management of Vines in the Hot-house or Pine-stove.—Having a Hot-house built according to the instructions given under the article *Stoves;* and having taken the proper precautions to lay it dry by drains, and by a floor of chippings of stone, coarse gravel, broken bricks, or lime rubbish, eight or ten inches thick, over which a thin layer of fine loam may be well puddled to fill up the chinks, if necessary, on account of having a retentive clay soil or a barren sand; and having given the whole a fall of six or eight inches; unless the soil should happen to be a rich sandy loam, fill up the area with a compost-mould composed of one-fourth strong loam, one-fourth turf from a pasture where the soil is a sandy loam, one-fourth sweepings or scrapings of pavements or hard roads, one-eighth rotten cow and stable-yard dung mixed, and one-eighth of vegetable mould from decayed Oak-leaves; the grass must be well rotted, and the whole worked together till it is uniformly mixed. Where sandy loam cannot be had, common sand may be used; and the mould of rotten sticks, or old woods, or from hollow trees, may be substituted for decayed leaves. This border being prepared, if the weather will permit, the Vines may be planted at the end of February or the beginning of March, in front of the hot-house, or stove; having first taken the precaution to put a little moss round the upper part of each stem, with two or three folds of paper over it, tied with bass-matting, to prevent the eyes from being injured in putting the plants through the holes in the wall. Opposite to each rafter, and close to the front wall, make a hole two feet over, and one foot deep; make the mould taken out of the holes fine, and add a little of the compost. Turn the plant carefully out of its pot, and put the upper part through the hole. If the shoot will just reach the bottom of the rafter, when planted, it will be sufficient, but as the earth may settle a little, it is better to allow two or three inches for this circumstance. In closing the mould to the plant, care should be taken to preserve the roots, their fibres being exceedingly brittle. Lay a thin coat of rotten dung over the mould, and give the plant a gentle watering; then take off the bandage, and fasten the top of the shoot to the rafter. Only one shoot should remain on each plant. Two may be left for a time, but when one is secure, the other must be taken off, but not close to the old wood, as that would occasion it to bleed. From the time the Vines begin to grow, they will require constant watering, especially in dry weather, and before the roots have penetrated deep into the border. Train a shoot up to each rafter, and if the rafters be not a sufficient depth to keep the leaves of the Vines from touching the glass, fix iron pins of about nine inches in length, at proper distances under each rafter; these should have a small hole or eye at the bottom, through which a small iron rod or strong wire should be thrust, for the support of the branch. The pins and wires must be painted. The Vine-plants will frequently shew fruit at one year old, but this should not be suffered to stand, except a single bunch, if wanted to ascertain the sort. During the summer, water the roots constantly; keep them regularly fastened to the rafters; divest them of their wires and lateral shoots; and, above all, guard them against the depredations of the red spider and other insects. The Vines may be permitted to run two-thirds of the length of the rafters, twenty or twenty-five feet, before they are stopped: and those which grow remarkably strong, may be suffered to run the whole length of the rafters, or about thirty feet. After these shoots are stopped, which is done by pinching off their tops, they will, in general, push out laterals, at three or four eyes on the upper part of the shoot; it will be prudent to permit these to grow twelve or fourteen inches before their tops are pinched off. These, in their turn, will push out secondary laterals, which should be pinched off at the second or third joint; and thus the sap may be diverted till the end of the season. November and the beginning of December, when the leaves begin to fall, is the best season for pruning. The first season, supposing the Vines to have grown with equal vigour, the shoots may be pruned alternately to three,

four, or five eyes, or to about twenty-one or twenty-two feet; but if they have grown moderately strong, the shoots should be pruned down to about eleven feet. By this alternate pruning, the former shoots will make fine wood for the succeeding season, and the latter will produce a crop of fruit; after which, these fruit-bearing shoots must all be cut down nearly to the bottom of the rafters. But when any of the plants appear weak, and have not made shoots more than eight, ten, or twelve feet long, it will be proper to prune every shoot down to two, three, or four eyes. In pruning, take off the shoots, with a clean sloping stroke, about half an inch above the eye, making choice of a bold eye to terminate the shoot, and fastening it completely to the rafter. Vines in Pine-stoves begin to make weak shoots early in January; the house being then kept warm on account of early crops raised in most hot-houses. But when it is kept to a proper degree of heat for Pines during the winter months, the Vines will seldom begin to push till about the middle of February. It is usual to see them push only towards the ends of the shoots, the other eyes remaining in a dormant state, and causing a long space of naked wood. To make the eyes push more generally, as soon as the sap is in motion, keep the house, for a short time, a few degrees warmer than usual. In the morning the thermometer should be 5° or 6° above temperate, and in the day-time the house should be kept as warm as the weather will permit. It will also be necessary to guard the stem of the Vine on the outside against frost; for one severe night would greatly injure, if not totally destroy, the hopes of a crop. This may be done, by wrapping the part exposed round with moss, fastened thick with bass-matting. Leave this covering on till spring frosts are over, and then wash the stem well to clean it. When Vines break out freely, they push at almost every eye, nearly at the same time. It is easy to distinguish which will make the most promising shoots, even as soon as the eyes begin to break; and by the time they are three or four inches long, the bunches are very distinguishable. The Vines should be divested of the least promising and supernumerary shoots as soon as possible, as it will greatly contribute to invigorate the remainder. Caution should be observed not to leave too abundant a crop; for few bunches in a high state of perfection, are preferable to many in a less. Therefore in case the shoots which are pruned to about twenty-two feet, should shew two or three bunches at almost every eye, as they will frequently do, no more should be permitted to stand than the leading shoot, and four or five on each side; and the remaining shoots should have only one bunch left on each, which should be the best proportioned and most regularly formed. The shoots should be left four or five feet apart on each side, and one shoot as near the bottom as it can be got. Train them regularly on each side of the rafter, and pinch off the top of each, as soon as it begins to interfere with the adjoining shoot above; or, in general, let the shoots be stopped at the second or third joint above the bunch. During the time of flowering, should the weather prove hot and dry, with brisk winds, the berries of many kinds of Grapes, particularly the Blue Frontinac, White Sweetwater, and Black Damascus, are liable to fall off at the time of their setting, and the remainder are in general small, and without stones. This proceeds from the calix adhering to and drying upon the germ, and thereby preventing its impregnation. It is proper, therefore, at this period, to water the roots of the Vines plentifully, to keep the house as close as the weather will permit, and to water the walks and flues in the hot-house constantly, especially late in the evening, when the glasses should be immediately closed. The heat of the house will exhale the moisture, and raise a kind of artificial dew, which, by falling upon the calix, will cause it to expand and fall off. But although Grapes set best in a close moist air, yet the house should not be violently hot during the time of their setting. When the weather is serene, transparent drops of dew will be observable in a morning on the points of the leaves. This is the most favourable indication that can happen at the season of the Vine's flowering: for the Grapes set well, and the growth of the berries is extremely rapid, when the Vines are in this state. Pull off all superfluous shoots, and divest the young shoots of all their laterals, during the summer. Do this without reserve, because every shoot left more than twenty feet long at the last year's pruning, with intent to produce a crop of fruit, must be cut down nearly to the bottom at the next winter's pruning. But all the rest of the Vines that were cut down at the last year's pruning, suppose one at every alternate rafter, must be trained with one shoot each, exactly the same in every respect as in the preceding season. When Grapes are at their last swelling, are becoming transparent, and change from green to red or black, and till they are nearly on the point of being ripe, the Vines will require a plentiful supply of water, especially if the season prove hot and dry. The situation of Vines in a Pine-stove, may be considered as similar to that of very hot climates, where they cannot have Vineyards without a command of water. After the fruit is cut, the Vines will not require any other management till the pruning season, but taking off their lateral shoots in the same manner as in the preceding year. At the next winter's pruning all the Vines that produced a full crop of fruit, should be cut down nearly to the bottom, that is, to the lowermost summer-shoot, which should also be cut down to the first or second eye. But all those Vines that were cut down nearly to the bottom the preceding season, and which will, in general, have made very strong wood, must be left to the length of twenty-one or twenty-two feet each, with intent to produce a full crop of fruit the following season. The management of the Vines during the next summer, will be nearly the same as in the preceding one: only as they have increased in strength and size, they will be enabled to produce and support a larger burden of fruit. The crop should at all times be proportioned to the size and vigour of the Vine: but especially whilst Vines are young, great moderation should be used as to the number of bunches that are allowed to ripen. The shoots may now be laid rather closer than in the preceding season, and two bunches may remain on strong and vigorous shoots, especially of those kinds which do not produce large bunches. The bunches should be well thinned when the berries are about the size of a small shot. The main shoulders, as also the less projecting parts of the bunch, should be suspended by small strings to the rafters, and every part raised to an horizontal position. In thinning the berries, great care should be taken to leave all the most projecting ones on every side of the bunch. In very close-growing bunches, it will be necessary to clip out more than two-thirds of the berries; in some, one-half; but in the loose-growing kinds, one-third is generally sufficient. Thus the remaining berries will swell well, grow to a great size, and not be subject to rot, as they are apt to do in a hot-house, when they are wedged together. Not only the rafters or roof of the hot-house, but the back-wall also above the flue, may be furnished with fruit. For this purpose, let every fourth or fifth Vine-plant be trained in one shoot quite to the top of the rafter, and then directed sideways ten or twelve feet along the top of the back wall. At the winter's pruning, bring down that part of the shoot perpendicularly, and cut it off at one foot above the top of the flue. The

next spring, encourage only two shoots from the two extreme or lowermost eyes of each shoot so brought down, and train them in an horizontal direction one foot above the top of the flue. These shoots, however, will grow with greater readiness, if they are trained upwards during the summer; and they may easily be brought to the desired position at the next winter's pruning. They will then form against the back wall the figure of the letter ⊥ inverted. In the next season the horizontal shoots will produce new wood from almost every eye, provided all the shoots be pinched off from every other part as soon as they appear. Lay in the shoots from one to two feet apart, according to the kind of Vine. Train all the shoots in a perpendicular direction, and, provided they are strong and vigorous, suffer them to grow to the length of five or six feet before they are stopped; but all these shoots must be cut down to two or three eyes at the next winter's pruning. Only one shoot should be permitted to rise from each spur the following season; and although they will in general be sufficiently strong, and produce two or three bunches a piece, yet only one bunch should remain on each shoot: these will then be large and fine, and the wood will be greatly benefited by such practice. But these shoots must be pruned next winter very differently. One shoot must be left four feet, that next it only a few inches long, and so alternately. The Vines on the rafters will require a management in future seasons nearly similar to that already described for them; and although it will not be advisable to prune them alternately so near to the bottom of the rafters as was directed for the two preceding seasons, yet it will be frequently found necessary to cut an old shoot down to the lowermost summer shoot, as near to the bottom of the rafter as can be. The side-shoot, on the other rafter, should not be permitted to ramble over the adjoining lights; but at the end of every season it will be proper to cut such shoots down to the second or third eye next the old wood, provided the bottom eyes are bold and strong: this must be done not only to streogthen the Vines, but also to prevent the roof of the house from being too much crowded with old wood. Whilst the Vines are young, one rafter will suffice for a Vine-plant; but when they become older, they will require a larger space; especially the strong growing kinds, which produce large leaves and bunches. It will be proper therefore to train shoots sideways on the wall-plate, from the stem of the plant, immediately at its entrance into the house. These shoots should be carried up the adjoining rafters, and the plants growing against such rafters must be taken entirely away; except it should happen that the plant growing against such rafter is trained forward to furnish the back wall. When a Vine-plant occupies two or more rafters, it will be right to prune occasionally, particularly whilst the Vine is young, one or more of such shoots down nearly to the bottom of the rafter. This will not only contribute to strengthen the plant, but will afford means to furnish the rafters with a succession of young wood. When Vine-shoots are thus conducted to different rafters, every shoot may be considered as a separate plant, and must be trained up in one shoot; from that time it will require a management similar to that already laid down.

On the propagation of Vines by seed.—Besides the common modes of propagating the Vine by layers and cuttings, (see pp. 761, and 768.) they may also be increased by seeds, by grafting, and by inoculation. In raising Vines from seed, it should be sown at the end of February or beginning of March, in pots filled with light fresh mould, and plunged into a moderate hot-bed, gently sprinkling the mould from a watering-pot having a fine rose. Six or eight seeds, if gathered from ripe Grapes, and carefully preserved through the winter, will be sufficient for a small pot, for if sown too thick, the plants are apt to be drawn, and weak. In dry weather, water the pots gently every day; but in wet or moist weather, give them so much water only as will keep the mould moist till the plants begin to vegetate. Let this be done in the afternoon, when the sun is going off the frame; which should be shut down immediately, and if the heat be not too great, it may remain shut during the night. As the heat of the bed decays, add a lining of horse-dung, to be shaken up and repaired, as occasion requires, till the plants have got sufficient strength to do without any bottom heat. About the end of August take the lights off, that the plants may be hardened before winter, taking care to shelter them in frames covered with mats, which will prevent the autumnal frosts from injuring the tender shoots. When the plants are about six inches high, transplant them singly into other pots (deep forty-eights,) filled with light fresh mould, taking great care not to hurt the roots, or to break the leaders; then plunge them again into the hot-bed; but if the heat of the old bed be too much decayed, have a new one prepared to receive them. If they grow vigorously, they must be shifted into larger pots (thirty-twos.) When the plants are above six inches high, tie them to small rods, as high as the frames will permit, leaving only one stem for the first year. When the leaves begin to drop, pick them carefully off the pots, to prevent the plants from becoming mouldy. Keep the plants under frames, or in the green-house, in hard winters, to shelter them from severe frost. In March or the beginning of April, if from seed ripened in this country, plant them out against the walls where they are to remain; but if from foreign seed, plant only one or two, till it has been ascertained that they are worth cultivating. After they are planted, cut them at the third eye, if strong; but at the second, if weakly; at the same time rubbing off the lower bud with the finger and thumb. Mr. Speechley recommends the Grapes designed for seed to remain on the Vine till they are perfectly ripe, when the stones are generally of a very dark-brown colour; to take them from the pulp, and to lay them on a sheet of paper, in some airy, but shady place, to dry, till spring. The intention of raising Vines from seed being to procure new varieties of Grapes, superior to the old ones in the hot-house, where a variety of the best Grapes is trained, the young branches of two different kinds should be so brought together, as soon as they shew their fruit, that their bunches, in the same state of maturity, may admit of being entwined. Attention should be paid to the size, the flavour, and the delicacy of the skin and flesh; also to the form of the bunch, and the length of the footstalk. All the Frontinac Grapes are proper to add flavour to other kinds; the White Muscat of Alexandria is a good one to be joined with many other sorts, on account of its large loose-growing bunches, and large well-flavoured berries; the White Sweetwater may be coupled with various sorts that are small and less delicate; particularly with the Red Frontinac; the Syrian with the White Muscat of Alexandria; the Black Hamburgh with the White Frontinac or Sweetwater; the Black Damascus with the Grizly Frontinac; Flame-coloured Tokay with Red Frontinac; White Muscat of Alexandria with White Sweetwater; Black Frontinac with White Muscadine; St. Peter's Grape with White Muscat of Alexandria. It is probable that many of the present varieties of Grapes have been obtained from seed, either sown by hand, or accidentally let fall by birds, &c. And it is undoubtedly the chief, if not the only way, to obtain new kinds with us. If therefore it be little practised, it is partly on account

of the distant prospect of fruit, partly from the hazard of obtaining better kinds than we have already. To this it may be answered, that a seedling Vine, judiciously managed, will produce fruit the third or fourth year; and if proper care and attention be bestowed on the seed sown, the best sorts may very reasonably be expected.

On Grafting of Vines.—At the pruning season, make choice of cuttings for grafts, or scions, from the best bearing branches of the sorts intended to be propagated. In general the bottom part of the last year's shoot is to be preferred; but in well-ripened vigorous wood, any part of the shoot will answer, provided it be not too long-joined. These cuttings should be preserved in pots filled with light sandy earth till the grafting season. Vines in a Pine-stove should be grafted in the beginning of January; but the middle of March is a proper season to graft Vines growing in the open air. In general, they should be grafted about three weeks before they begin to break into bud. Upon small stocks, not more than an inch in diameter, cleft-grafting is most proper; but upon larger stocks, whip-grafting is to be preferred. In both methods care should be taken in fitting the stock and scion together, and the operation should be performed with great exactness. Fasten them together with bass-matting, and cover them with clay in the usual way. Though the scion will sometimes begin to push in a few weeks, yet it will frequently remain dormant two or three months: during this period the stock must be stripped of all its shoots, as soon as they appear; and to preserve the scion in a vegetative state, the clay must be kept moderately moist, by wrapping wet moss round it, and by keeping the moss constantly sprinkled with water. When the scion has made shoots five or six inches long, the clay and bandage should be carefully taken off. But the most eligible method with Vines is grafting by approach. In which case it is necessary to have the plant intended to be propagated in a pot. Strong plants, that have been two or three years in pots, are to be preferred; but plants from the nursery may be potted, and grafted in the same season, if brought into a hot-house or vinery. Fine Grapes and good wood may be obtained even the first season by any of these methods, but particularly by the last; in which it is obvious that the graft has a double support; namely, from the stock, and from the plant in the pot. In grafting by approach, the clay and bandage should remain two or three months after the graft has formed a union; for if it be taken off sooner, the graft will be very liable to spring from the stock. The pot should be plentifully supplied with water till the month of August, when the graft should be separated from the plant in the pot. Two or three inches of wood below the bottom of the graft may be left, but should be taken clean off at the next winter's pruning. The Syrian Vine is the most proper for stocks; and plants raised from seeds of this sort, are greatly preferable to plants raised either from layers or cuttings for this purpose. If the produce of these seeds should even degenerate to a kind of wildness, they will still be the better for stocks, because they will on that account rise with greater vigour. The most important advantages of grafting are; first, that if a wall should have been planted with bad kinds of Vines, instead of stubbing them up, and making a new border, by which several years must elapse before the wall can again be completely filled; by grafting, the nature of the Vines may be changed immediately; for good Grapes may be obtained from the same year's graft: and in a hot-house, the grafts, if permitted, will frequently shoot thirty or forty feet the first summer. Secondly, in small Vineries, or Vine-frames, where great variety could not be had in the common way; it may be procured by grafting different kinds upon the same plant. But the principal advantage of grafting, is the improvement of the various kinds, and particularly the small ones, which generally make weak wood. This may be done by grafting the weak and delicate-growing Vines upon the stocks of those which are more robust and vigorous. Thus the Small Blue Frontinac, engrafted on the Syrian Vine, produces well-sized handsome bunches, with berries almost as large as those of the Black Hamburgh.

On propagating Vines by Layers.—Vines may be increased by stools in open quarters, in the same manner as nurserymen propagate forest trees and shrubs; but the best way is to train shoots that will easily bend, on walls, at full length during the summer, and in February to lay the finest and strongest across the foot-path into pots (twenty-fours or sixteens) filled with fresh mould, and plunged in the ground about two inches below the surface; at the same time making an incision or two in the old wood, or giving it a twist just below a joint: they will generally take without notching or twisting, but it is the surer way to do it. The layers must then be cut, leaving two or three strong eyes upon each. When the shoots begin to run, tie them to long stakes, to prevent their being broken by the wind. Pick off all the runners and side-shoots, leaving only two or three fine strong shoots on each plant, which should be trained at full length during the summer. As soon as the shoots are laid down, cover them with good dung or rotten leaves, to keep the mould moist: and in very dry summers, give them a good watering once or twice a week. By this method, there may be two or three rows of layers from one wall; taking care to lay the branches alternately, and to keep the pots plunged about two inches below the level of the ground. The plants will be well rooted in the pots before autumn, and fit for planting in vineries, hot-houses, &c. When they are to be planted out, cut them carefully from the mother Vine, and carry them in the pots to the place where they are to be planted; taking care to preserve the ball of earth about their roots as much as possible, when they are turned out of the pots. If the season be warm and fine, Grapes of early kinds ripen very well on these layers before they are taken up; and, if properly managed, they will bear some fruit the first year after planting. One of the strongest shoots must be left nearly at full length, cutting it as high as the uppermost full bud, leaving nothing but round well-ripened wood. If there are three shoots, the remaining two should be cut so as to leave only two full eyes upon each, which should be trained at full length, to produce fine wood for next year. The shoot which was trained the preceding year should then be cut down, leaving only two strong eyes to produce wood for the following year; and so on every year, cutting the branches alternately. By so doing, the walls will be kept always covered with fine healthy bearing wood; and much time will be saved in furnishing hot-houses and vineries.

Further Directions for propagating Vines by cuttings.—The cuttings should be chosen from those shoots which are best ripened, and have the shortest joints, always having one or two joints of the last year's wood, cutting it perfectly smooth and a little rounding at the lower end, and as near to a joint of the old wood as possible. Cut the upper end smooth and sloping towards the wall; or, if in beds or borders, let the cut always face the north. Against piers or walls, set them at about a foot distance, and so deep as to have the second eye level with the ground; remembering always to rub off the lower eye. Pick off all runners and side-shoots, leaving only two shoots, which should be trained at their full length. In February they may be

pruned, leaving one or two eyes on each, according to the strength of the shoot. In the first year, especially if the summer be dry, and they have not been duly watered, they will make but little progress: but in the second year it will be plainly discerned which is the strongest plant, and that only should be left to fill up the vacant space on the wall. The rest should be taken up and planted in other situations where they are wanted. Make choice of the cuttings after a dry warm season; each should have two inches of the old wood, with one eye of the new. When the Vines are pruned, there will be great choice: select such as are of a middling size, and have the wood round and perfectly ripened. Cut the bottom part perfectly smooth; and if any of the old dead snags remain, cut them off close to the quick wood, and cut the top sloping towards the back of the hot-house or frame. Put only one cutting in each pot, which should be a deep forty-eight, filled with rich light mould well prepared. The plants will thus grow much stronger and quicker than when many are crowded together, and the sun and air will have a freer admission to ripen the wood. When the plants begin to get strong, and the pots full of roots, shift them into larger pots (thirty-twos.) This mode is best adapted to private gardens. But they who raise plants for sale, and cannot conveniently spare so much room, may plant three or more cuttings in each pot. A method frequently practised by nurserymen and gardeners, who wish to have their plants fit for sale the same year, is to set them in pots in the hot-house, among the tan, on the flues, or round the curbs of the pit. They may be raised in this manner, either singly in small pots, or several together in larger ones, transplanting them singly when they have taken root. In this case it will be necessary to have a hot-bed ready to plunge the pots in as soon as they are transplanted. Thus their growth will be forwarded very much, and before autumn they will be fit for sale.

On the Pruning and Training of Vines.—In the management of the Vines after being thus raised and trained, as they rarely produce fruit from wood that is more than a year old, care should be taken to have such wood in every part of the tree: and as the size and fineness of the bunches depend in a great measure on the bearing-wood being strong and well ripened, where the Vines produce small bunches, they should be cut down to two or three eyes, in order to have strong wood for the next year. If there be much old naked wood on the Vines, with some small weak shoots at the extremities, cut them down as near the ground as possible: you will then have no fruit for that year. Or, you may cut every other shoot; leaving the old ones to produce some small Grapes. The next year, there will be plenty of fine wood, provided the strongest shoots have been nailed in, and all the side-shoots pinched off, or cut out with a sharp penknife close to the bud or eye: but never twist them, for by twisting you hurt the bud that is to produce fruit next year; always observing to cut as near to a bud as possible, and taking care to lay in the wood very thin in summer, that the sun and air may be freely admitted to ripen it well. Keep the shoots nailed to the wall, to prevent their being broken by high winds; and pick off all the side-shoots every time they are nailed, which ought to be done several times during the summer months, according to the quickness of their growth. In fine weather they will require to be looked over once every fortnight or three weeks. Never suffer the Vines to run together in a cluster, and mat; for that will infallibly ruin them for bearing the succeeding year. It is advised that the Vines be trained in a serpentine manner; and the shoots of such should be topped as soon as the Grapes come to the size of small peas, at a joint or two above the fruit; but never top the leading shoot, nor that which you intend should bear fruit next year. In the second year never prune till the beginning of February, except in very forward seasons, owing to a fine autumn and mild winter, after the wood has been well ripened in the preceding summer; in which case the Vines will be more forward in the middle of January, than in backward seasons at the end of March. It is common to begin pruning soon after the fall of the leaf; but if a frost sets in before the wood is hard, it will be very much injured. When the leaves begin to fall, take a soft broom, and sweep them off upwards gently; which will assist in hardening the wood. In February, always make choice of the strongest and longest shoots, leaving them as long as the eyes are good and plump, and the wood round; but by no means leave them when they become flat, for such seldom bear fruit, or if they do, it will be very small. Never lay in any that has less than from fifteen to thirty good eyes, according to the strength of the shoot; which will produce two bunches from every good eye. The shoots that have borne fruit in the preceding year should be cut out the next year, except when you want to fill the wall, and the shoots are very strong. Never leave any but fine strong wood, always cutting at the second, third, or fourth eye; rubbing the lowest bud off, and that which comes out at the joint between the new and last year's wood. By these means you will get as much fruit from these short shoots as you would have by the common way of pruning. Observe to leave two or three of the strongest shoots for next year's bearing wood, and never to top them. If there is not room to train them, you may lead them over the tops of the other trees, if the Vines are planted against piers; or you may run them behind the standards, and thus cover the whole of the wall. You may also run the shoots at the bottom of the wall behind the dwarf trees; or you may tack them down over the top of the wall, on the other side where the walls are low; you may train them over the tops of trees on each side; which never does any harm to the trees below, provided they are kept nailed to the wall; they may even be planted on north and east aspects, and trained over the tops of the south and west walls to fill the upper parts, till the Peaches and nectarines cover them, when a part of the Vines must be cut away.—The usual season for pruning is the end of October, but about the beginning of April, when the Vines begin to shoot, they should be carefully looked over, rubbing off all small buds from the old wood, which only produce weak dangling branches: this may be repeated in the following month.

On Watering Vines.—The Vine reqnires a warm dry soil in England, yet in a hot dry summer it should have a plentiful supply of water, especially in the hot-house. In hot countries the Vine is said to grow most luxuriant near water, and the allusions to this circumstance in Scripture are very frequent. In Madeira, we are told, they do not attempt to plant Vineyards, except where there is a command of water: and in Spain a copious vintage depends upon abundant rains. With respect to Vines on walls in the open air, after the Grapes are set and begin to swell, they may be watered three times a week, if the weather be hot and dry, with the Barrow Engine; sprinkling them all over the leaves and fruit, pressing your forefinger over the top of the pipe, to throw the water as fine as small rain. This will keep the Vines clear from dust and insects, and promote the swelling of the fruit; but it must never be done when the nights are cold and frosty. The best time for the operation is about four o'clock, in a south aspect; for the sun will then be going off the wall,

and the leaves will have time to dry before night. In very hot dry weather, a good bottom watering once a week, will forward the swelling of the fruit; but when the fruit is fully swelled, it should be left off, particularly when the nights begin to be cold, for it would then hurt the flavour of the fruit. Vines in hot-houses, provision being made by drains, &c. as above directed, to keep the border in a dry state during winter, should have gentle and frequent waterings in spring, when the weather is dry. When the Vines are in flower, even the frequent sprinkling the flues and walks in a hot-house; and the border, &c. in a vinery, will greatly benefit the plants. A good heat, however, should be kept up, because Grapes set best in a vaporous heat of between seventy and seventy-five degrees. In a hot-house, if the walks, &c. are sprinkled when there is a strong sun, the exhaled moisture will instantly form a kind of artificial dew, which is exceedingly nourishing to Grapes in their infant state. When strong fires are kept, if the flues are frequently sprinkled with water, a steam will arise, which has also a good effect: with this view, contrivances have been made to introduce hot steam into stoves. When the Grapes are grown to the size of small peas, the Vines will require a constant supply of water, till they are full grown. If the border be kept in a moderate moist state during the above period, the Vines will grow luxuriant, and the Grapes will swell to a large size; but when the Grapes are nearly ripe, the waterings should be less frequent, as too much water at that season would tend to debase their flavour. When the crop is gathered, the border should be frequently watered, till the leaves of the Vines begin to change. But from that time, and during the winter, the border should be kept in a dry state. It does not seem necessary to water the leaves of Vines growing in the stove, except they should be infected with insects. But during a mild rain, the upper lights may be let down, that the Vines on the back wall may reap the benefit of it. During winter, the Vine-border may be watered with the drainage of dunghills; but this should only be applied when the roots are in a state of inaction.

On the Preservation of Vines and Grapes.—Although the Vine is not very liable to be infested with insects, when growing in the open air; yet few plants suffer more from their ravages than when trained under glass, especially in Pine-stoves; the constant warmth kept up in these houses during winter serving to keep up the succession of them from one season to another. A species of Acarus, commonly called the Red Spider, is the most pernicious; these insects frequently attack the leaves of the Vine early in the summer, and their increase in dry weather being very quick and great, they will soon greatly damage, and in time totally destroy, the foliage. They generally reside and breed on the under side of the leaves; and when they are very numerous they work a fine web all over it, and round the edges. The upper surface appears full of very small dots or spots of a light colour. The red spider, however, does not confine itself to the leaves, but attacks the bunches of Grapes also, especially when they are almost ripe; and as they extract the juice from them, the Grapes soon become soft, flabby, and ill-flavoured. The Thrips, an hemipterous insect, sometimes attacks the young shoots of Vines growing in the open air, especially those which are weak or newly planted. If young shoots are injured by late spring-frosts, the tender part of the leaf will curl up, and change to a dark brown colour: in this state the thrips attacks them with great greediness, especially the White Sweetwater and Muscadine. This insect, however, is seldom injurious to Vines growing in the open air, except in the spring: to those in the hot-house they are most hurtful when the Grapes are nearly ripe; they attack the bunches as well as the leaves, and commonly prey upon the extremities of the berries, particularly that next the footstalk. Aphides, or plant-lice, sometimes infest the young shoots of Vines, but as they grow very rapidly, these insects do not often greatly injure them. Two or three species of Cocci sometimes infest the Vine, as Coccus hesperidum and adonidum. The latter is sometimes mistaken for the crimson-tinged Pine-bug. These abound in hot-houses and conservatories, and breed upon the Coffee-tree, Oleander, &c. but they are not very prejudicial to the Vine. All these insects, the Acarus excepted, may be destroyed by a strong fumigation of tobacco. For the method of doing this, see the article *Stoves*. It would be improper to fumigate late in the spring, or in the summer, because the smoke would injure the Grapes, by giving them a disagreeable flavour. Where insects have been numerous the preceding season, they must be destroyed effectually before the Vines come into flower; this may be done by fumigating two or three different times, at the distance of three or four days between each operation. Pine-stoves are much more liable to be infested with these insects, than Grape-houses or Vineries, because in these it is usual to take off the glass frames during the winter, by which the insects generally perish; but the warmth of the Pine-stove protects them through the winter. In these two, the thrips is often greatly encouraged by the vegetables cultivated there, particularly by kidney-beans. In order therefore to prevent the increase of these insects, which is very rapid, after the stove has been fumigated, remove all the kidney-bean plants, and then sow a fresh crop of them immediately, placing the pots all over the flues, &c. that in case any insects should have escaped the fumigation, the young kidney-bean plants may attract them: as soon as these plants appear to be infected, take them away and sow a fresh crop. The red spider may be destroyed by a composition of one pound of flowers of sulphur, and two ounces of common Scotch snuff, or very good tobacco dust, well mixed together. Take a small brush, such as is used for common painting, dip it lightly in the composition, then lay one hand on the upper surface of the leaf, and with the other draw the brush very gently backwards and forwards all over the under surface. The Acarus being soft and delicate, is hereby destroyed with the most gentle touch; the brush also readily wipes off their web, as well as their globular transparent eggs, which are fastened by a fine membrane to the leaves; and thus we are secured from the danger of a succeeding brood. This process may seem tedious; but it is easily performed upon Vines trained in a regular manner, and a single operation is generally sufficient for a whole season. This should be performed as soon as the insects make their appearance. Sulphur alone is sufficient for the purpose, but the snuff or tobacco dust renders the mixture equally fatal to the thrips also. Mr. Forsyth asserts, that the best thing to destroy the red spider, and other insects, is moisture. Frequent watering of trees with lime-water, and throwing it plentifully on the under side of the leaves, will in a short time extirpate the red spider. In hot-houses, he recommends using water only, in the following manner: Between three and four in the afternoon, fill the barrow-engine with soft water, wheel it along the paths of the house, where they are wide enough to admit it, and sprinkle all the plants; play also in a fine shower against the top lights and shelves, till the water stands an inch deep in the paths. If you cannot conveniently get the barrow-engine into the house, and have not Philip's small copper engine, or some other of the like sort; open the front lights, and throw water in from

thence. When this operation is performed within, every light must be shut; when from without, keep one light only open at a time; the house must be then kept close shut till next morning: this will cause such an exhalation from the glass, tan, &c. that the plants will be covered with the vapour, which will infallibly destroy the cocci, aphides, and other insects: but the watering must be repeated every afternoon, during hot weather only. Before morning the plants will have imbibed all the moisture, and the paths will be perfectly dry. To protect Grapes as they ripen from birds, in the open air, they must be bagged; or, where the bunches hang very thick, the Vines may be covered with nets, or bunting, which is the stuff of which ships' colours are made; these will admit the air freely to the Grapes; and will soon dry after rain. They are also the best covering in the spring, in cold, wet, or snowy weather. For wasps and the large flesh-fly, or blue-bottle, as it is vulgarly called, there is no other remedy but hanging plenty of bottles with some sweet liquor in them upon the Vines. The fly comes first, and is no less destructive to the fruit than the wasp. The bottles should be hung up as soon as the former make their appearance; and should be emptied frequently. When the weather is very hot, and the wasps are numerous, they will frequently be so intent upon the fruit as not to enter fast enough into the bottles: if you then take a little oil in a cup, and with a feather dipped in it, touch their backs, they will instantly drop down. Great numbers may easily be destroyed this way; and so might the flies, if their motions were not so quick that it is difficult to touch them. The bunches of Grapes should be kept under the shade of the leaves till they begin to ripen; then those which cover the fruit may be picked off, leaving such as are a little above it to be a shelter from the wet and frost in the nights; this will assist in ripening the fruit; and take off only a few leaves at a time, according to the quantity of Grapes to be gathered at once: by these means the fruit will continue three times as long in succession, as it would if the leaves were picked off all at once. If all the leaves should be taken off soon after the fruit is set, the fruit will not swell, but become hard and small, and generally crack. When the leaves are not too thick, they admit the rays of the sun to pass through, and a warm glow of heat will be reflected from the wall. Grapes will often hang on the Vines till the middle of November, if they are well covered with nets or bunting; but when the frost begins to set in sharp, they should be gathered. Where several bunches are on one branch, it may be cut off, leaving six inches in length, or more, of the wood, according to the distance between the bunches, and a little on the outside of the fruit at each end: seal both ends with common sealing-wax, then hang them across a line in a dry room, taking care to clip out any berries that begin to decay or grow mouldy. In this way Grapes may be kept till February; or, if they are cut before the branches are very ripe, they may be kept much longer. They may also be preserved in jars; each bunch being wrapped in soft paper, and layers of bran, well dried, being laid between them. Put some bran at the bottom and top, shake the whole gently, put some paper over it, and cover the jar with a bladder firmly tied on, to exclude the air. Keep the jar in a dry room, or where you can have a fire in wet or damp weather. With respect to the transporting or carriage of Grapes, when they are to be conveyed by water, they may be packed in boxes or jars with sand. They are thus brought from Portugal. But sand is too heavy for land-carriage, and the Grapes must then be washed before they can be eaten. They may also be packed with any small bright seed. Clover-seed is very proper for this purpose; but this also is heavy, and too valuable to be wasted. Some pack them in tow, wool, cotton, or paper-shavings. Mr. Speechley recommends oat-chaff as most eligible, both on account of its lightness and its elasticity. Care should be taken that it have not any disagreeable smell, and that it be cleansed of all impure matter; the Grapes should be perfectly dry, and the branches well examined, that if there be any decayed, cracked, or bruised berries, they may be clipped off; each bunch should then be tied in a bag of silver or gauze paper. Grapes packed in this manner, ought not to be more than two courses in depth, otherwise the lower bunches would be liable to suffer injury by the weight above. The course of chaff, between the layers of fruit, and likewise at the top and bottom, ought, when it is well pressed down, to occupy a space of two or three inches. When Grapes are to travel by a stage-coach, the boxes should be made to suit the seats of the coach; for unless they go within or on the top, they will commonly be spoiled.

2. Vitis Palmata; *Palmate-leaved Vine.* Leaves palmate, smooth; segments gashed; umbels racemed. Branches purplish, smooth; racemes an inch long, with approximating umbellets. This, and the eighth species, are supposed to be mere varieties of Vitis Vinifera.—Native of Virginia.

3. Vitis Indica; *Indian Vine.* Leaves cordate, toothed, villose beneath; tendrils racemiferous. Trunk woody, sending out many slender branches, furnished with branching tendrils, by which they fasten themselves to trees; flowers in bunches like those of the other sorts; succeeded by fruit of an austere taste. It produces a great quantity of small black grapes in the lower hills of Jamaica; but they are of a rough taste, and would doubtless make an excellent wine if properly managed. It seems to thrive best in the red hills; and in Jamaica it is known by the name of the Water Withe. When it grows luxuriant, as it does generally in the higher woody lands, it is so full of juice that a piece of about three feet will yield nearly a pint of clear tasteless water, which has been providentially the means of saving the lives of many who have wandered long in the woods without any other refreshment of a liquid sort.—Native of both Indies, and of Cochin-china. It will not live in England without artificial heat, but is easily propagated by seeds, brought from those countries of which it is a native, as it does not produce seeds in this climate. The seeds should be plunged into a hot-bed of tanners' bark, shading them from the sun until they have taken new root; then they must be treated in the same way as other tender exotic plants from the same countries, always continuing them in the stove, otherwise they will not thrive. They lose their leaves every winter.

4. Vitis Flexuosa; *Japanese Vine.* Leaves cordate-toothed, villose beneath; stem flexuose; panicles elongated, without tendrils, with glomerate floscules.—Native of Japan.

5. Vitis Labrusca; *Downy-leaved Vine.* Leaves cordate, subtrilobate, toothed, tomentose underneath. Stem very long and slender, branched, and climbing by tendrils; flowers very small, pale, on short lateral racemes; berries round, black, acid but edible. There is a variety cultivated under the name of *Bland's Grape*, which Mr. T. Nuttall thinks is no way inferior to some of the best European sorts; it is perfectly hardy, and exceeds in produce every other Vine of the United States.—Native of North America, Amboyna, Cochin-china, and Japan. This and the next species grow abundantly in the woods of America, but have not been known to produce fruit in this country. Their pruning and management is the same as any other sort of Grapes, only they should have fewer shoots, and those shortened down very low, otherwise they will make weak shoots, and produce no fruit.

6. Vitis Vulpina; *Fox Grape* or *Vine.* Leaves cordate, tooth-serrate, naked on both sides. Stem shrubby, climbing by tendrils; berries black, with a disagreeable flavour, resembling the nauseous scent of a fox, whence its name.—Native of Virginia.

7. Vitis Heterophylla; *Various-leaved Vine.* Leaves simple, gash three-lobed and five-lobed, serrate, naked. Stem climbing, somewhat angular, smooth and even, jointed, knobbed; branches alternate, spreading, resembling the stem; flowers axillary; corollas white.—Native of Japan, where it flowers in July and August.

8. Vitis Laciniosa; *Parsley-leaved Vine.* Leaves quinate; leaflets multifid. The stalks and branches of this species resemble those of the Common Grape; the fruit is round, white, and disposed in loose bunches. There is a variety with red fruit.—Long known in gardens, but its native country uncertain. It is planted against walls, and treated in the same way as the common Vines.

9. Vitis Hederacea; *Ivy-leaved Vine.* Leaves quinate, ovate, acuminate, toothed.—Said to be a native of North America: well known in England, where it is cultivated as an ornamental climber to cover buildings. It flourishes in the closest courts and alleys of the metropolis. In autumn, the leaves, before they fall, assume splendid tints of red and orange.

10. Vitis Æstivalis; *Summer Grape.* Leaves broadly cordate, three or five-lobed, finely toothed, downy and rusty when young; clusters oblong. Berries small, dark blue, very agreeable to eat, and frequently converted into a good home-made wine.—Found in fields and woods from Virginia to Carolina, flowering in May and June.

11. Vitis Arborea; *Pepper Vine.* Leaves superdecompound; lateral leaflets pinnate. Stem woody, sending out many slender branches, which climb by tendrils; flowers axillary, in loose bunches, very small, white, composed of five small petals, which fall off soon after they expand. They are not succeeded by any fruit in England; but the berries which come from North America, their native country, have three seeds in each.—This is preserved in gardens for the sake of variety, but it rarely produces flowers in England, and has not much beauty. It is generally propagated by laying down the young branches, which will put out roots in one year fit to remove, when they may be taken off and transplanted where they are to remain. They require support, and as their young branches are tender, and liable to be killed by frost, when planted against a wall or pale exposed to the south, they will succeed much better than when exposed to the open air, and propped. The young shoots should be shortened down to two or three buds in the spring.

12. Vitis Cordifolia; *Heart-leaved Vine.* Leaves cordate, acuminate, inciso-dentate, glabrous on both sides; racemes loosely multiflorous; berries small, green or amber-coloured, ripening very late, and of a very tart taste.—Grows on the edges of rivers, and in woods, from Canada to Florida.

13. Vitis Riparia; *Sweet-scented Vine.* Leaves unequally inciso-dentate, very slightly trifid; petiole pubescent at the nerves and margin; flowers of an exquisitely fine smell, somewhat resembling Reseda Odorata. The female plants are very seldom found north of the Potomac river, though the male extend very far beyond it.—Grows on the gravelly shores and islands of the rivers from Pennsylvania to Carolina.

14. Vitis Rotundifolia. Leaves lucid on both sides, reniform-cordate, subequally dentate; berries very large, dark blue, agreeable, commonly called Bull or Bullet Grapes.—Grows on river sides and islands, from Virginia to Florida, flowering in June and July.

Vitmannia; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, short, four-cleft; segments rounded, concave within, convex without. *Corolla:* petals four, linear, oblong, little concave, thickish, hoary on the outside, obtuse, unguicular; nectary a small obovate scale at the base of each filamentum, shorter on the alternate ones. *Stamina:* filamenta eight, a little shorter than the petals, smooth; antheræ linear, subbifid at the base. *Pistil:* germen superior, four-lobed; lobes semiorbicular, compressed, slightly connate, easily separable from one another; style simple, awl-shaped, length of the filamenta; stigma acute. *Pericarp:* nut semilunar, compressed, one-celled, valveless. *Seed:* one, large, obovate-sickled, turgidly lenticular, smooth. Essential Character. *Calix:* four-cleft. *Corolla:* four-petalled. *Nectary:* a scale at the base of each filamentum. *Nut:* semilunar, compressed, one-seeded.——The only known species is,

1. Vitmannia Elliptica. It is a tree, with round smooth branches, compressed a little at the tip; leaves alternate, a hand and more in length, elliptic, obtuse, quite entire, smooth on both sides, veined, stiffish, on a short petiole, which is flattish above, but convex underneath; fruit a corky or woody nut, compressed like a lens, bigger than the palm of the hand, or scarcely an inch in diameter, and from a narrow beginning widening gradually into the shape of a fly's wing, but always somewhat concave and snail-shaped.—Native of the East Indies.

Ulex; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth two-leaved, permanent; leaflets ovate-oblong, concave, straight, equal, a little shorter than the keel; upper leaflet two-toothed, lower three-toothed. *Corolla:* papilionaceous, five-petalled; standard obcordate, emarginate, erect, very large; wings obtuse, oblong, shorter than the standard; keel two-petalled, straight, obtuse, converging by the lower margin. *Stamina:* filamenta diadelphous, simple, and nine-cleft; antheræ simple. *Pistil:* germen oblong, cylindrical, hirsute; style filiform, rising; stigma obtuse, very small. *Pericarp:* legume oblong, turgid, scarcely longer than the calix, straight, one-celled, two-valved. *Seeds:* few, roundish, emarginate. Essential Character. *Calix:* two-leaved. *Legume:* scarcely longer than the calix. *Filamenta:* all connected. ——The species are,

1. Ulex Europæus; *Common Furze, Whin,* or *Gorse.* Calix-teeth obsolete, converging; bractes ovate, lax; branchlets erect. It varies from two to six feet in height; the branches are very close, deeply furrowed, woolly or hirsute, full of thorns, which are stretched out, branched, angular, very sharp, smooth, evergreen, leafy; peduncles axillary, single, or two together, one-flowered, villose; corolla half as long again as the calix, bright yellow, or gold-coloured, having the smell of honey so strong as to scent the whole air when the flowers are in full vigour.—Native of Britain, Denmark, Brabant, France, Portugal, and some parts of Germany, on dry, gravelly, and sandy heaths and commons. It abounds more in Portugal and the south of France than in any other country, except our own. In the south of England it is called Furze; in the eastern counties Whins; and in the northern Gorse. Some years ago, the seeds were sown for hedges, and in light soils it soon formed a strong fence, but in a few years these hedges became naked at bottom, and some of the plants failing they fell into disuse. On very poor hungry sand or gravel, it has produced more profit than any other crops, especially where fuel is dear, as it may be used in heating ovens, burning lime and bricks, and for malt-drying; and the ashes may be used for making ley. It

has been much grown for fodder in Scotland. The colliers in the forest of Dean chop it small, and give it to their horses in winter with great advantage. Team-horses may be supported by it if it be cut young, and bruised in a mill to break the thorns. Goats, cattle, horses, and sheep, will feed upon the tender tops. In some respects it is a very hardy plant, and will make fences upon the bleakest mountains, and close to the sea-side, where the spray of the sea destroys almost every other shrub; but it does not bear cold well, and is often cut down to the roots, and even destroyed, in severe winters. There are several varieties; as, the Common Yellow Furze; the White-flowered Furze; the Short-spined Furze; the Large French Furze; the Small Dwarf Furze; and the Round-podded Furze.—It propagates itself plentifully by seeds, which are cast out of the pods to a considerable distance when ripe.

2. Ulex Nanus; *Dwarf Furze.* Calix-teeth lanceolate, distant; bractes minute, pressed close; branchlets decumbent. This is generally considered as a variety of the preceding species. It is smaller, with shorter spines, of a paler green; in the former the thorns are longer than the corolla, in this the corolla is as long as the calix, and the thorns are shorter than the corolla. If these characters were proved to be permanent, this would be determined as a distinct species. It propagates itself by its seeds.

3. Ulex Capensis. Leaves solitary, obtuse; spines simple, terminating; stem woody and hard, covered with a greenish bark when young, but afterwards becoming grayish; branches slender and woody.—Native of the Cape of Good Hope, where it usually grows to the height of five or six feet. It is preserved in our green-houses or dry-stoves along with other hardy exotics: it is difficult to increase by layers or cuttings.

Ulmus; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth one-leafed, turbinate, wrinkled; border five-cleft, erect, coloured within, permanent. *Corolla:* none. *Stamina:* filamenta five, sometimes four, even as many as eight, awl-shaped, twice as long as the calix; antheræ four-grooved, erect, short. *Pistil:* germen orbicular, erect; styles two, shorter than the stamina, reflexed; stigmas pubescent. *Pericarp:* capsule oval, large, juiceless, compressed, membranaceous, winged, one-celled. *Seed:* one, roundish, slightly compressed. Essential Character. *Calix:* four or five cleft, inferior, permanent. *Corolla:* none. *Capsule:* membranaceous, compressed, flat, one-seeded.——The species are,

1. Ulmus Campestris; *Common Elm.* Leaves doubly serrate, rugged, unequal at the base; flowers subsessile, heaped; bark cloven, on the branches corky; flowers from their proper gems, clustered, scarcely peduncled, numerous, brownish flesh-coloured; capsules oblong. This tree grows to a great size, and will arrive to a load of timber in forty years. The flowers have a violet smell. The bark of the young trees, and the boughs of the old, are smooth and very tough, and will strip or peel from the wood a great length without breaking: the bark of the body of the old trees, as they grow in bigness, tears or rends, which makes it very rough. The innermost wood is of a reddish yellow or brownish colour, and curled, and after it is dry very tough and hard to cleave. The wood next the bark or sap is white. Before the leaves come forth the flowers appear, about the end of March, growing on the twigs or branches, closely compacted or thrust together, of a red colour; after which come flat seeds, more long than broad, not much unlike the Garden Arach seed in form and size. They generally fall away before or shortly after the leaves appear, but some hang on a great part of the summer. There are several varieties of the Elm; as, the Small-leaved English; the larger Rough-leaved English; the Small-leaved Cornish; the Smooth-barked Wych Elm; the Broad-leaved ditto; the Scotch; the Rough-leaved Dutch, with large leaves; the Yellow or Golden-striped; the Silver-striped; the Silver-dusted, &c.—The Elm appears to be a native of England, for there are no less than forty places, named after it, most of which are mentioned in Doomsday Book. Many trees of enormous size have been noticed in various parts of the kingdom, some nearly three yards in circumference near the root, and nearly two centuries old. This tree grows upright; and, says Mr. Gilpin, when it meets with a soil it loves, rises higher than the generality of trees; and after it has assumed the dignity and hoary roughness of age, few of its forest brethren, though correctly speaking it is not a forester, excel it in grandeur and beauty. Its character in its skeleton partakes much of the Oak, so much that when it becomes rough and old, at a little distance may be mistaken for the Oak. In full foliage, its character is better marked; and no tree is more adapted to receive grand masses of light; nor is its foliage, shadowing as it is, of the heavy kind. Its leaves are small, and give it a natural lightness: it commonly hangs loosely, and is in general very picturesque. The timber is of singular use, especially where it may lie continually dry, or wet, in extremes: hence it is well adapted for water-works, mills, pipes, pumps, aqueducts, pales, ship-planks beneath the water line; also for wheelwrights, and for handles for the single hand-saw. Rails and gates of this timber, when thin-sawn, are not so apt to rive as Oak. The knotty parts are fit for naves and tubs, the straight and smooth for axle-trees, and the very roots for curiously dappled works. It has scarcely any superior for kerbs of coppers, feather-edge and weather-boards; but it does not easily admit the nail without boring. Chopping-blocks, blocks for the hat-maker, trunks, and boxes to be covered with leather; coffins, dressers, and tables of great length, and of a lustrous colour, if rightly seasoned. It is also fit for the carver, on account of the nature of the grain, and its toughness, which fits it for all those curious works of statues and architecture, not being subject to warping. Vitruvius recommends it both for tenons and mortises; and it makes the second-best sort of charcoal. Wherever bricks are scarce and dear, great quantities of this tree are cut up for studs and weather-boarding, for the sides of barns, stables, and even dwelling-houses, and in the southern counties it is often substituted for oak. The bark, dried and ground to powder, has been mixed with meal by the Norwegians, to make bread in times of scarcity. The leaves, suffered to dry upon the branches, and laid up in a dry barn, prove a great relief to cattle in winter, where fodder is scarce: they are acceptable to horses, cows, sheep, goats, and swine, for which they are gathered in some parts of Herefordshire. It is said that silkworms will devour the leaves, when tender, with great avidity. The inner tough bark has no remarkable smell, but a bitterish taste, and abounds with a slimy juice, which has been recommended in nephritic cases, and externally as a useful application to burns: the bark of the branches is more bitter than that of the trunk, and therefore probably more efficacious. The complaints for which it is chiefly recommended are of the cutaneous kind, allied to herpes and lepra: a decoction drank freely has been known to carry off the water in dropsies. Dr. Lettsom found it most effectual in what he supposed to be the lepra ichthyosis of Sauvages, in which it succeeded, after all the medicines usually employed in such cases had failed. A remarkable instance

of its efficacy also in lepra vulgaris, affecting the whole body, is related by Banau, who proposes its use in various other diseases, as fluor albus, rheumatism, old ulcers, cancerous and scrofulous affections, scald head, and scurvy. In very obstinate cases it is necessary to persevere in the use of the decoction for some months.—*Propagation and Culture.* All the sorts of this tree may be propagated by seeds, layers, or suckers taken from the roots of the old trees, the latter of which is generally practised; but as they are frequently cut up with indifferent roots, they often miscarry, and render the success doubtful; whereas those propagated by layers are in no danger, and always root better and come on faster than the others; hence this method should be more generally practised, especially as they are not so liable to send out suckers from the roots. A small piece of ground filled with stools of these plants will be sufficient to furnish a nursery of considerable extent annually, with layers for transplantation. The best soil for such a nursery is a fresh hazel loam, neither too light and dry, nor even moist and heavy. The ground should be well trenched; and if a little rotten dung be buried in it, that will be serviceable. Care should be taken to pick out all the pernicious weed-roots, which, if left, would be very mischievous to the layers, and cannot be afterwards so easily removed. When the ground is weeded and levelled, plant them about eight feet asunder each way. The best season for this is in autumn, as soon as the leaves begin to decay, that they may take root before the dry weather in the spring comes on, by which a great expense in watering them may be avoided; for if well settled in the ground before dry weather, they will afterwards require little more than to muleh their roots to keep the earth from drying. These plants should be permitted to grow rude for two years, during which time the ground between should be dug and trenched every spring, by which time they will be well rooted, and have made pretty strong shoots, which may then be laid in the ground. The manner of doing this, the reader will find fully explained under the article *Laying*. When these layers are well rooted, which will be in one year, they should be taken off, and transplanted out into a nursery, which should be upon a good soil. The plants should be placed in rows about four feet asunder, and two feet apart in the rows. This should be performed in autumn as soon as the leaves begin to decay, and if there be some mulch laid upon the surface of the ground about their roots, it will preserve them from being hurt by frost in winter, and from drying winds in spring. In the following summer the ground between them should be constantly kept clean from weeds, and in autumn they should be pruned off, cutting away all strong lateral branches, which would impede their upright growth; but there must be some of the smaller shoots left on to detain the sap, in order to augment the stems of the trees; for where they are pruned up too naked, they are liable to become too slender to support themselves, whence their heads reeline to the ground, and cause their stems to become crooked. In this nursery they may remain for four or five years, observing constantly to dig the ground between them every spring, and to trim them as before directed, which will promote their growth, and render them strong enough to transplant out where they are to remain, in the time already stated. All sorts of this tree, the Wych excepted, on account of the large arms which they throw out, are very proper to plant in hedge-rows, upon the borders of fields, where they will thrive much better, than in a wood or close plantation, and their shade will not be particularly injurious to whatever grows under them; but when they are transplanted out upon banks, the banks should be well wrought, and cleared from all other roots, otherwise the plants being taken from a better soil, will not make much progress in such places. Michaelmas is the proper time for this work; but when they are planted, there should be some stakes fixed in beside them, to which they should be fastened, to prevent their being displaced by high winds. Part of their heads should be taken off before they are planted, which will also be of use in preventing their being easily overturned. The leading shoot, however, should by no means be stopped, nor the branches too closely cut off, which would probably cause them to miscarry.—These are very proper trees to plant at a distance from a garden or building, to break the violence of winds, for which purpose there is not any tree more useful, as they may be trained up in the form of an hedge, keeping them cut every year, which will cause them to grow very close and handsome, to the height of forty or fifty feet, and be a great protection against the fury of winds: but they should not be planted very near fruit-trees, because the roots of this tree would deprive the others of nourishment. The roots are also very prejudicial to gravel walks, on account of their sending forth abundance of suckers. In large gardens, where shade is required, there is scarcely any tree so proper, as it is easily removed, even when grown to a considerable size; so that a person who is desirous to have his plantation afford shade in a short time, may procure trees of nearly one foot in circumference in the trunk, which will be in little danger of failing, if removed with care: and these will take root, and grow very well, though not so well as young plants, which is what few other trees will do; but then they should be such trees as have been thus regularly trained up in a nursery, and have good roots, and not such as are taken out of hedge-rows, which seldom rise with any tolerable roots, and often miscarry. In fact, this has been the real cause of so many plantations of Elm failing; for although some of them may live a few years, yet few of them are of long duration, and they rarely increase much in their stems, but frequently grow hollow, their heart decaying first, so that they are supported only by their bark or shell for a few years, and in the very first severe winter, or very dry summer, they are generally destroyed. But though Elms trained up in a nursery may be removed with safety at a larger size than most other trees, still it is not the best method to transplant them when large, for if people would have a little patience when they plant, and never plant any which are more than four or five inches in the girth of their stems, they will in a few years become better trees than any of those which are transplanted of a much larger growth, and grow to a much larger size; besides, they are more easily removed, and do not require to be strongly supported, nor is there much danger of the young trees miscarrying; therefore it is much more eligible to make choice of young thriving trees, yet not from a better soil than that in which you design to plant them, and never to plant any large trees, unless where a small number may be wanted for an immediate shade; and in such cases it is always proper to plant some young trees among the large ones, to succeed them when they fail. In planting of these trees, great care must be taken not to bury their roots too deep, especially in a moist loam or clay; and if clay be near the surface of the soil, it will be the best way to raise the ground into a hill where each tree is to be planted, which will advance their roots above the surface of the ground, so that they will not be in danger of rotting in the winter with moisture. When these trees are propagated by suckers taken from the foot of old trees, they are commonly laid into the ground in rows pretty close together in beds, where in dry weather they may be frequently watered, to prevent their putting out

roots. In these beds they are commonly left two years, by which time, those that will live (for a great many of them generally die) will be rooted, and may then be transplanted into the nursery, and treated as has been directed for layers. In order to raise this tree from *seed*, gather the seeds at the beginning of June, and spread them for a few days in a dry place. Mark out beds four feet wide; with alleys between them, a foot and half or two feet broad. Sow the seeds thinly over the beds, and cover them with mould half an inch thick. Hoop the beds in order to cover them with mats in hot weather, when they must also be sometimes refreshed with water. In about a month many of the young plants will appear, and the rest in the following spring. Uncover the mats in cloudy or showery weather, and take them wholly away at the end of August, that the plants may be hardened against winter. In October, or the following spring, the plants may be taken out of the seed-bed, and planted in a nursery in rows three feet asunder, and each plant at eighteen inches' distance, there to remain, with the usual care of digging and hoeing, till finally planted out, which may be done at almost any age, especially if removed every two or three years. All sorts of Elms may be increased by *grafting* on the Broad-leaved Wych Elm. These may also be raised from seed, and will be of a proper size to receive the graft when they have been two or three years in the nursery. The beginning of March is the best time for the work; and they are to be grafted only two inches above the root, so that the clay may be wholly covered to guard against frost. This is supposed to be a valuable improvement of the English Elm, which will thus arrive at timber many years sooner than trees raised by layers, and grow to a greater size. An error prevails respecting the Elm, that it will not flourish in close plantations: whereas how often do we see two of these trees standing close together, both equally well stemmed? indeed the shoots of the Elm will interweave with each other, in a manner we seldom see in any other sort of tree. But although we see them thrive abundantly in groups and close groves, it must be remarked that their stems, then running up clean, and in a great measure free from side-shoots, render the timber different from that which is raised in more exposed situations, where the lateral shoots being numerous, and lopped off from time to time, the stems become knotty, by which means the natural tenacity, in which the peculiar excellence of this wood consists, is considerably increased. The time for felling Elm is from November to February.

2. Ulmus Suberosa; *Cork-barked Elm.* Leaves doubly serrate, somewhat unequal at the base; flowers subsessile, conglomerate, four-stamined; fruits smooth; bark of the branchlets corky, winged. This species was imported from Holland at the beginning of the reign of King William III. and is principally remarkable for its rapid growth, and rough fungous bark. The wood is of a very inferior quality.—Native of many parts of Europe, in woods, and about villages, flowering in March.

3. Ulmus Montana; *Broad-leaved Elm*, or *Wych Hazel.* Leaves doubly-serrate, acuminate, unequal at the base; flowers peduncled, diffused. The trunk divides into long, wide, spreading, winged branches, which are very brittle. The bark on the outside is blacker than that of the first species, and is very tough, so that when there is plenty of sap it will strip or peel from the wood of the boughs, from the one end to the other, a dozen feet or more in length, without breaking. The timber is of the same colour as the common Elm, but is not so firm or strong for naves, though it cleaves more easily. This has, in general, the most picturesque appearance, because it hangs more negligently, though at the same time it loses, in a good degree, that happy surface for catching masses of light, which we admire in the common sort. A tree of this species, which was felled in Sir Walter Bagot's park, in Staffordshire, was forty yards in height, seventeen feet diameter at the stool, and yielded eight pair of naves, and eight thousand six hundred and sixty feet of boards and planks. This tree was formerly much used for bows. Though called, in the Statutes, *Witch Hasell*, it is very distinct from that so called in Essex, which is the Carpinus.—This appears to be the most common species throughout Europe: it is frequent in woods and hedges in Britain, flowering in March or April. It is sometimes raised from seed, which it produces in great plenty: they ripen in May, and should be sown upon a bed of fresh loamy earth, and gently covered. In dry weather they require watering, and the bed should be shaded from the violent heat of the sun. When the plants appear, clean them carefully from weeds, and after they have stood two or three years in the seed-bed, they will be fit to be transplanted out into the nursery, and there managed like the first species.

4. Ulmus Americana; *American Elm.* Leaves acutely serrate, unequal at the base; flowers on longish stalks; fruit ovate, deeply cloven, densely fringed. There are several varieties of this species; as the Red or Canada Elm, which in its native country grows to a vast size, and has its name from the red colour of its branches. The White Elm, so named from the whiteness of its branches: boats are made from the bark of this tree. The Drooping or Weeping Elm, is distinguished by its oblong smoothish leaves, and pendent branches —Native of the forests of Virginia, and other parts of North America, where it is known by the name of White Elm. These sorts produce plenty of seeds in their native country, but they seldom arrive fresh: the readiest way therefore to propagate them here is from layers. They may be grafted on English Wych and Dutch Stocks. See the first and third species, for further directions.

5. Ulmus Nemoralis; *Hornbeam-leaved Elm.* Leaves oblong, smoothish, equally serrate, almost equal at the base; flowers sessile. A tall and handsome tree, with a white brittle wood.—Native of North America.

6. Ulmus Pumila; *Dwarf Elm.* Leaves equally serrate, equal at the base. A bushy shrub, with shining, veiny, neatly serrated leaves. In the southern parts of Russia this equals the Oak in stature. The timber is very hard, tough, and gray, remarkably waved with transverse lines of a deeper colour, larger-fibred, and when exposed to the air becomes yellower than Oak, to which it is preferred. The root is beautifully variegated, and fit for the use of the turner. A variety of this species is common with both young and old branches winged, and rendered irregular with compressed fungous excrescences of the bark variously interrupted. There is also a variety in mountain rocks, with shorter thicker branches, winged with fungous excrescences of the bark. The Russians sometimes use the leaves as a succedaneum for Tea.—Native of Siberia.

7. Ulmus Integrifolia; *Entire-leaved Elm.* Leaves quite entire; fruit orbicular, emarginate. Trunk straight and high; bark a little scabrous, of a dirty gray colour; branches numerous, spreading so as to form a large shady head; flowers hermaphrodite and male, mixed from little gems over the naked branchlets. They appear during the cold season, and the leaves fall about the close of the wet season, but come out again in March.—It is a very large timber tree, native of the Circar mountains; and is called *Naulie* by the Telingas, who esteem the wood for various purposes.

8. Ulmus Fulva. Branches scabrous, albid; leaves ovate-oblong, acuminate at the base, subequal, unequally serrate, pubescent on both sides, very scabrous; buds tomentose with dense yellow wool; flowers sessile. The viscous inside bark is used by the natives as a healing salve.—Grows on mountains from Canada to Pennsylvania.

9. Ulmus Alata. Branches alate-suberose on both sides; leaves oblong-oval, sensibly acute at the base, subequal; fruit pubescent, ciliose. A middle-sized tree, with leaves like Hornbeam.—Grows in the sandy low woods of Virginia and Carolina.

Ulva; a genus of the class Cryptogamia, order Algæ. Essential Character. *Frond*: membranaceous or gelatinous. *Seeds*: solitary, scattered throughout its substance under the cuticle.——The species are,

* *Frond expanded, leafy.*

1. Ulva Pavonia; *Turkey-feather Laver.* Frond membranaceous, flat, kidney-shaped, with a taper base; seeds in transverse arched lines. It consists of several fronds, from one to three inches high, growing from one central root. The seeds are thickly lodged in many brown, arched, transverse, continued lines, making an elegantly striped appearance, and resembling the feathers of a turkey-cock.—It is found upon submarine rocks and stones, on the south coast of England, as well as throughout the Adriatic and Mediterranean, on the shores of France, Portugal, and Spain.

2. Ulva Flabelliformis; *Green Fan Laver.* Frond spongy, filamentous, flat, fan-shaped, laciniated and jagged, with a taper base.—Native of the Adriatic and Ionian Seas.

3. Ulva Atomaria; *Concentric-dotted Laver.* Frond membranaceous, flat, dilated, palmate; segments linear, slightly branched, sometimes fringed. Root a small, dilated, downy disk, bearing a pale olive-brown, thin, wedge-shaped frond, four or five inches high.—Found on the coast of Norfolk.

4. Ulva Ligulata; *Laciniated Red Laver.* Frond membranaceous, flat, branched; branches dilated, somewhat forked, with obtuse sinuses; terminated and fringed with strap-shaped segments. Frond three to six inches high, light red.—Found on different parts of the coast of Norfolk.

5. Ulva Lactuca; *Oyster-Green*, or *Green Laver.* Frond membranaceous, pellucid, palmate, bright green; segments contracted below, dilated upwards, obtuse, plaited. Within the last few years it has been often introduced at the tables of the opulent, stewed, and seasoned with lemon-juice, probably with a view to the benefit of the scrofulous. It is a very excellent laxative.—Found on most of the shores of Europe, growing on stones, pebbles, shells, and the larger sea-weeds, forming annual tufts of thin green leaves.

6. Ulva Lubrica; *Slippery Laver.* Fronds tufted, oblong, convoluted, inflexed, undulated, rugose, interbranching, very thin and slippery, so that it is very difficult to gather it entire.—Found in the stagnant ditches of fresh water and marshes of Germany.

7. Ulva Terrestris; *Thin Ground Laver.* Fronds membranaceous, very thin, decumbent, clustered, curled and plaited.—Found in shady places, gravel walks, and sometimes on old thatched woods.

8. Ulva Bullosa; *Cellular Green Laver.* Frond membranaceous, very tender, dilated upwards, variously sinuated, cellular, bright green. It appears beautifully dotted when examined by a microscope.—Found in shallow stagnant ditches of fresh water in Germany and England.

9. Ulva Plicata; *Plaited Firm Laver.* Fronds green, plaited, laciniated, elongated, combined and imbricated at the base.—Found upon submarine rocks, stones, and shells.

10. Ulva Plantaginea; *Plantain-leaved Laver.* Fronds aggregate, membranaceous, simple, oblong, obtuse, flat, entire, minutely warty, brown, tapering at the base.—Native of the coasts of Italy and England.

11. Ulva Umbilicalis; *Peltate Laver.* Frond rather coriaceous, purplish-olive, orbicular, sessile, peltate, spreading, nearly flat, variously lobed.—Found upon the sea-shore attached to the rocks or stones by its centre root, and often washed up on a sandy beach.

12. Ulva Mesenteriformis; *Mesenteric Laver.* Frond solitary, oblong, broad, plaited, wavy, cellular and rugose, dark green.—Native of the Northern Seas.

13. Ulva Coccinea; *Scarlet Laver.* Flat, roundish, membranous, sinuated, scarlet. Frond from six inches to a foot in diameter, wavy, pellucid, shining.—Found upon submarine rocks and stones, near Plymouth and Falmouth.

14. Ulva Furcellata; *Reddish Forked Laver.* Frond nearly cylindrical, gelatinous, repeatedly forked, reddish; ultimate segments flattened, lanceolate, cloven.—Found in Hampshire and Norfolk.

15. Ulva Multifida; *Laciniated Brown Laver.* Frond rather cartilaginous, brown, compressed, repeatedly branched, somewhat palmate; seeds irregularly scattered; root smooth.—Found upon the beach at Yarmouth.

16. Ulva Montana; *Red Mountain Laver.* Frond leathery, dark red, of numerous, ascending, rounded, flatted, finely granulated lobes. This has the smell of Common Dulse; and the Highlanders, who make a thin pulpy mixture to purge their calves, by rubbing it between their hands into some water, call it Mountain Dulse.—Found among grass and moss, on the mountains of Scotland.

17. Ulva Rupestris; *Broad Rock Laver.* Frond leathery, depressed, very wide, indeterminate, smooth, slippery, of a dull red.—Found on the wet surface of a rock above Tylogé Bridge, near Hafod in Cardiganshire.

18. Ulva Dichotoma; *Green Forked Laver.* Frond membranous, quite flat, repeatedly forked, reticulated, pale green, with linear obtuse segments.—Found upon the coast of Scotland and Cornwall.

19. Ulva Linza; *Riband Laver.* Frond oblong-lanceolate, folded, green, somewhat undulated and cellular.—Found in recesses of the sea, and salt-water ditches, in various parts of Europe.

** *Frond concave, or tubular.*

20. Ulva Intestinalis; *Gut Laver.* Frond tubular, membranous, green, irregularly cellular.—Found attached to stones and rocks, in the salt-water ditches of Great Britain.

21. Ulva Compressa; *Compressed Laver.* Frond tubular, more or less branched, compressed, irregularly constricted, green; the branches elongated.—Found on submarine rocks, stones, and posts, throughout Europe.

22. Ulva Ramulosa; *Green Sharp-branched Laver.* Frond tubular, very much branched, somewhat compressed, green; ultimate branches scattered, extremely numerous, sharp-pointed. This very elegant species is remarkable for the innumerable little branches scattered over each principal ramification, which give it the aspect of a *Conferva*.—Found in Bantry Bay, Ireland.

23. Ulva Purpurascens; *Purplish Laver.* Frond tubular, branched, nearly cylindrical, purplish-brown; branches mostly opposite, simple or compound, acute.—Found on submarine rocks and stones, on the southern coast of England.

24. Ulva Fistulosa; *Pipe Laver.* Frond tubular, uniform simple, bluntish, a little zigzag, gelatinous, yellowish-brown.—Found at Falmouth, &c.

25. Ulva Turneria; *Reticulated Laver.* Frond membra-

nous, tubular, simple, bluntish, brown, finely reticulated; seeds in little patches.—Found in Bantry Bay, and on the Suffolk coast.

26. Ulva Rugosa; *Corrugated Cape Laver.* Frond membranous, tubular, branched, corrugated, tuberculated, dark brown; branches two-ranked, bursting at the extremity.—Found in the sea, near the Cape.

**** Frond fleshy, solid.*

27. Ulva Diaphana; *Transparent Fleshy Laver.* Frond gelatinous, solid, tumid, pellucid, roundish or compressed, with numerous irregular branches. It has been supposed to be an animal substance, but evidently belongs to this genus by the distribution of what appears to be the seeds. It exactly resembles wet sea-sand in colour.—Found on the sea-coast of Great Britain.

28. Ulva Defracta; *Broken Laver.* Frond thread-shaped, solid, unbranched, elastic, viscid, pellucid, with pale red dots.—Found on the beach at Weymouth, and upon the east coast of Scotland.

29. Ulva Filiformis; *Thread-shaped Laver.* Frond gelatinous, thread-shaped, much branched, purplish: branches scattered, distant, very long. Annual.—Native of submarine rocks and stones near Christchurch, Hampshire.

30. Ulva Capillaris; *Capillary Laver.* Frond gelatinous, thread-shaped, much branched, pale; branches alternate, capillary, acute. Annual; from May to October.—Found near Christchurch in Hampshire, as well as at Margate.

31. Ulva Rubens; *Reddish Short-branched Laver.* Frond gelatinous, thread-shaped, equal, reddish or greenish, much branched; branches scattered, horizontal, obtuse. Annual.—Found in Portland island, and near Pool in Dorsetshire, upon submarine rocks and stones.

32. Ulva Rubra; *Crimson Laver.* Frond gelatinous, much branched, forked, thread-shaped, unequal, somewhat flattened, bright red, smooth.—Found near Christchurch, and also on the coast at Scarborough, in August.

33. Ulva Plumosa; *Feathered Green Laver.* Frond gelatinous, green, thread-shaped, compressed, branched; branches pinnate, with numerous parallel, linear, shining segments.—Found on the coasts of Sussex and Devonshire.

34. Ulva Protuberans; *Prominent-seeded Laver.* Frond gelatinous, thick, angular, green; seeds elliptical, at length prominent and deciduous. This singular production is a collection of thick, fleshy, juicy, angular or wrinkled, obtuse lobes, about half an inch high, of a light pellucid grass-green.—Found growing among moss, on wet shady parts of the sand-rocks, at Uckfield, in Sussex.

Umbrella Tree. See *Magnolia.*

Uncaria; a genus of the class Pentandria, order Monogynia.—Essential Character. *Corolla:* salver-shaped. *Germen:* crowned with a gland. *Stigma:* two-grooved. *Pericarp:* two-celled, many-seeded. This genus is merged in *Nauclea.*——The species are,

1. Uncaria Inermis. Leaves oblong, ovate, acuminate; stem unarmed. This very much resembles Nauclea Parviflora, from which it differs in having the leaves more ovate and acuminate.—Native of Guiana.

2. Uncaria Aculeata. Leaves ovate, acute; stem prickly.—Native of Guiana.

Uniola; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume many-flowered, many-valved; valves imbricate in a double row, awl-shaped, compressed, navicular, keeled, one closed over the other; the last pair many-flowered, containing an ovate flatted *spikelet;* sharp at the edge. *Corolla:* two-valved; valves lanceolate, compressed, like those of the calix; the inner valve surpassing the other a little. *Stamina:* filamenta three, capillary; antheræ oblong, linear. *Pistil:* germen conical; styles two, erect, simple; stigmas pubescent. *Pericarp:* none; the corolla encloses the seed. *Seeds:* one, ovate-oblong. Essential Character. *Calix:* many-valved. *Spikelet:* ovate, keeled.——The species are,

1. Uniola Paniculata; *Panicled Spike Grass.* Panicled: spikelets ovate. It is one of the largest and most magnificent grasses; the culm rising from four to six feet, round, jointed, smooth, leafy in the lower part, and terminating in a spreading panicle eighteen inches long.—Known by the name of *Sea-side Oat* in Virginia and Carolina, where it is a native.

2. Uniola Mucronata. Spike distich; spikelets ovate; calices somewhat awned. Culm a foot high, even; flowers containing seven florets.—Native of the East Indies.

3. Uniola Spicata. Subspiked: leaves rolled in, rigid. Culm a span high; panicle very small, squeezed so close that there is scarcely any sign of pedicels, all directed one way.—Found on the coast of North America.

4. Uniola Latifolia. Panicle lax; all the spikelets with long pedicels; calix trivalve; flowers monandrous, subfalcate at the keel, pilose; leaves wide, plane. A very handsome grass.—Grows on the Allegany mountains, in shady woods, among rocks.

Unona; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* perianth three-leaved, very small, acute, pressed close. *Corolla:* petals six, lanceolate, sessile, gibbous at the base on the outside, at the same time excavated within into the shape of a pitcher. *Stamina:* filamenta none; antheræ very numerous, oblong, collected into a ball, within the pitcher of the corolla. *Pistil:* germen many, sessile; styles about ten, bristle shaped, approximating, rather longer than the antheræ. *Pericarp:* berries many, pedicelled, ovate, gibbous, jointed like a necklace. *Seeds:* two or three, ovate, smooth, one above the other. Essential Character. *Calix:* three-leaved. *Petals:* six. *Berries:* two or three seeded, jointed like a necklace.——The species are,

1. Unona Discreta. Leaves lanceolate, silky beneath. This is a tree, with narrow wandlike branches, which are pubescent. It has the flower of *Unona,* but the fruit is different, purple, sapid, aromatic, which distinguishes the genus, as in Theobroma and Abroma.—Native of Surinam, where it is called *Peyricaboom.*

2. Unona Tomentosa. Leaves lanceolate, tomentose. Stem upright, five feet high, sending out weak reclining branches; flowers yellow-green, terminating, solitary, hanging down by a very long pedunele. Loureiro called it *Desmos,* from the berries being joined like the links of a chain.—Native of Cochin-china.

3. Unona Discolor. Leaves ovate-oblong, smooth on both sides; branches round, purple, smooth, scarcely villose at the end.—Native of the East Indies.

4. Unona Concolor. Leaves oblong-acuminate, smooth on both sides, concolor; peduncles two-flowered.—Native of Guiana.

Unxia; a genus of the class Syngenesia, order Polygamia Necessaria.—Generic Character. *Calix:* common roundish, five-leaved; leaflets ovate. *Corolla:* compound radiate; ray indistinct; corollets hermaphrodite, five in the disk; females, as many in the ray: proper to the hermaphrodites, funnel-form, five-cleft; to the females, ovate, small. *Stamina:* in the hermaphrodites, filamenta five; antheræ cylindric, tubular. *Pistil:* to each; germen ovate; style simple; stigma bifid. *Pericarp:* none; calix unchanged.

Seeds: to all ovate, hard, naked. *Receptacle:* naked. Essential Character. *Calix:* five-leaved; leaflets ovate; florets of both disk and ray five. *Seed-down:* none. *Receptacle:* naked, flat.——The species are,

1. Unxia Camphorata; *Camphorated Balsam-weed.* Leaves opposite at the divisions, sessile, lanceolate, five-nerved, hirsute, soft. Stem herbaceous, filiform, dichotomous, two feet high; flowers solitary, from the divisions, on hairy stalks of various lengths; calix the size of a pea, nearly smooth; ray of the corolla spreading, small, yellow.—It has a strong smell of Camphor; whence in Surinam, where it grows naturally, it is called Camphor Plant. A decoction of it in water is esteemed an admirable sudorific, and of great efficacy in obstinate lumbago. The dried herb is used externally when the perspiration is supposed to be impeded.

2. Unxia Hirsuta; *Hairy Balsam-weed.* Leaves oblong, somewhat heart-shaped, hairy; stem villose. Annual.—Native of Cayenne.

Volkameria; a genus of the class Didynamia, order Angiospermia.—Generic Character. *Calix:* perianth one-leafed, turbinate, five-cleft; segments nearly equal, acute. *Corolla:* monopetalous, ringent; tube cylindric, twice as long as the calix; border five-parted, nearly equal, flat; segments reflexed to one side, gaping chiefly on the upper side. *Stamina:* filamenta four, filiform, very long, on the gaping side of the corolla; antheræ simple. *Pistil:* germen four-cornered; style filiform, length of the stamina; stigma bifid, one of the segments acute, the other indistinct. *Pericarp:* berry or drupe roundish, two-celled, with two kernels, grooved. *Seed:* nut solitary, two-celled, grooved. Essential Character. *Calix:* five-cleft. *Corolla:* segments directed the same way. *Drupe:* two-celled. *Nuts:* two-celled, with two kernels.——The species are,

1. Volkameria Aculeata; *Prickly Volkameria.* Leaves oblong, acute, quite entire; spines from the rudimenta of the petioles. Stem five or six feet high, branched, upright, the whole loaded with white scentless flowers, coming out from the sides of the stalks, five or six on the same peduncle, in shape somewhat like those of the Common Jasmine, but with a curved tube. It is one of the most common plants in the low-lands of Jamaica, in a dry gravelly soil, and also abounds in most of the other sugar islands of the West Indies.—This, and all the plants of this genus, are propagated in Europe by cuttings, which readily put out roots when they are planted in pots, and plunged into a moderate hot-bed, covering them close with hand-glasses. The cuttings may be planted any time from the middle of May to the end of July, when they put out roots. Separate the plants carefully, and put each into a separate small pot, and plunge the pots into a gentle hot-bed until they get fresh roots: then in warm weather inure them to the open air, and continue them abroad in a sheltered situation until the nights begin to be cold, when they must be removed into the house; there they will require some warmth, and should have the benefit of a moderate stove, but will grow weak in too much heat. They will not survive the winter in a common green-house.

2. Volkameria Ligustrina; *Long-leaved Smooth Volkameria.* Leaves oblong-lanceolate, quite entire; petioles, peduncles, and calices, hirsute. This differs from the next species, which it very much resembles, not only in the leaves, but the hirsute branches, and having the tube of the corolla three times as long as the calix, the filamenta white, the antheræ brown.—Native of the Mauritius.

3. Volkameria Inermis; *Ovate-leaved Smooth Volkameria.* Leaves ovate, quite entire, shining; petioles, peduncles, and calices, smooth. This rises higher than the first species, the stem and branches are stronger, and grow more erect, the bark is very white, and the flowers grow several together on long axillary peduncles, which generally stand erect. Willdenow mentions a variety with smaller and very blunt leaves; it so resembles the first, that they could hardly be distinguished without the spines.—Native of India.

4. Volkameria Capitata; *Headed Volkameria.* Leaves ovate, quite entire, scabrous; flowers in terminating heads; calix leafy. Branches bluntly quadrangular, hoary, smooth, tubercled, with the blunt prominent rudimenta of the petioles; calix bell-shaped, with a three-parted border, the segments very large, oblong.—Native of Guiana.

5. Volkameria Serrata; *Serrate-leaved Volkameria.* Leaves broad-lanceolate, serrate, subsessile; branches roundish; panicle brachiate.—Native of the East Indies.

6. Volkameria Scandens; *Climbing Volkameria.* Leaves petioled, cordate, ovate, quite entire; panicle corymbed, terminating; branchlets dichotomous. This is a scandent plant, with very long flexuose four-cornered branches, tomentose at the top. It climbs up the highest trees, crowning them with its snow-white flowers.—Native of Ceylon.

7. Volkameria Japonica; *Japanese Volkameria.* Unarmed: leaves cordate, ovate, acute, toothed; racemes directed one way. A lofty tree, smooth and branched; branches compressed, panicled at the end; flowers in racemes, at the ends of the branchlets; tube of the corolla purple; border shorter than the tube; capsule ovate, the size of a plum, four-valved, two-celled, opening transversely.—Native of Japan.

8. Volkameria Kæmpferi; *Kæmpfer's Volkameria.* Leaves cordate, pubescent, toothletted; panicle terminating, divaricate, on coloured peduncles. The peduncles of the whole panicle, the floral leaves, the calices, and the corollas, are scarlet.—Native of China and Japan.

Urania; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* spathes common, alternate, ovate-lanceolate, concave, many-flowered; partial two-valved, lanceolate-linear, long, channelled, coloured, acuminate, erect, permanent; perianth none. *Corolla:* petals three, oblong, channelled, erect, acute, equal; nectary two-leaved, one of them bifid. *Stamina:* filamenta six, filiform; antheræ linear, long, erect, inclined at the tip. *Pistil:* germen inferior, oblong; style a little longer than the stamina; stigma six-cleft, converging. *Pericarp:* capsule oblong, truncate, three-sided, three-celled, three-valved at the tip. *Seeds:* numerous, oblong, in two rows, covered with succulent laciniate arils. Essential Character. *Perianth:* none. *Corolla:* three-petalled. *Nectary:* two-leaved, with one of the leaves bifid. *Capsule:* inferior, three-celled, many-seeded. *Seeds:* in two rows, covered with an aril. ——The only known species is,

1. Urania Speciosa; *Superb Urania.* This is one of the most stately plants: the stem is erect, and crowned at the summit with an ample, radiating, vertical tuft, of very numerous, stalked, alternate leaves, spreading in two ranks, like a fan, many feet wide. The leaves resemble those of the Plantain-tree, but are larger and thicker.—Native of marshy places in Madagascar, where the inhabitants use the leaves as a covering to their houses.

Uredo; a genus of the class Cryptogamia, order Fungi. Essential Character. *Coat:* none. *Powder:* naked, deciduous. *Seeds:* uniform, generally globose.— —The species are,

* *Powder yellowish.*

1. Uredo Mycophila; *Mushroom Blight.* Widely spreading, extremely fine, yellow; seeds solitary or aggregate, on capillary stalks, simple or branched. This is found covering

the whole surface of several kinds of Boletus, and even penetrating their substance, in the form of a yellow powder, which stains the fingers when touched.

2. Uredo Alchemillæ; *Ladies' Mantle Blight.* Crowded, yellow, breaking out into nearly parallel lines.—Found in Germany, on the leaves of Alchemilla Vulgaris.

3. Uredo Euphorbiæ Helioscopiæ; *Spurge Blight.* Scattered, nearly globular, prominent, yellow. This is often found in summer upon the plant after which it is named.

4. Uredo Linearis; *Long Linear Blight.* Linear, parallel, very long, yellow, staining; afterwards assuming a darker colour.—Found on the leaves of the Poa Aquatica.

5. Uredo Rubi Fruticosa; *Bramble Blight.* Minute, nearly globular, powdery, bright yellow, deciduous.—This, as its trivial name imports, occurs on the leaves of Brambles.

6. Uredo Rubi Idæi; *Raspberry Blight.* Scattered, yellow, somewhat conical, breaking out in curved lines.—Found on the upper surface of Raspberry-leaves.

7. Uredo Tussilaginis; *Colt's-foot Blight.* Scattered, in subconcentric, reddish-orange dots, which at length become confluent.—Found in autumn on the leaves of the Colt's-foot, which it at length covers with orange powder.

** *Powder brown, bay, chestnut, or somewhat blackish.*

8. Uredo Suaveolens; *Sweet-scented Blight.* Confluent, fragrant, unequal: powder a pale brownish-purple.— Often found on the leaves of Serratula Arvensis in summer.

9. Uredo Viciæ Fabæ; *Bean Blight.* Crowded, orbicular, or partly irregular, depressed; powder brownish-chestnut. —Found abundantly upon the stem, and particularly the leaves, of the Common Bean.

10. Uredo Bullata; *Tumid Blight.* Prominent, bladdery: powder chestnut-coloured; seeds constricted in the middle. —Rare; found on the stems of umbelliferous plants.

11. Uredo Anemones; *Anemony Blight.* Rather large, depressed, bursting from a longitudinal fissure in the cuticle of the leaf: powder copious and black.—Found in spring, on the curled leaves of Anemone Nemorosa.

*** *Powder white.*

12. Uredo Candida; *Cream Blight.* Shapeless, tumid, white.—This is found throughout the summer on the branches and stalks of Shepherd's Purse, which appear greatly swollen, twisted, abounding with whitish fetid powder, which bursts irregularly through the shining cuticle. There are two varieties, one smaller and more depressed, found on different species, of Tragopogon: the other also smaller, roundish, but variable in shape, found on Alyssum Calycinum.

13. Uredo Cheiranthi; *Stock Blight.* Scattered, nearly globular, prominent, white.—This, which is very scarce, occurs on the foliage of Cheiranthus Incanus.

**** *Powder blackish or brown, parasytical on the parts of fructification of different plants.*

14. Uredo Segetum; *Corn Blight,* or *Smut.* Powder copious, black, produced within the glumes of grasses.—This generally appears like the transformation of the substance of the seed, in whole ears of Barley, Wheat, Oats, or even Agrostis, into a fetid sooty powder, and constitutes the disease termed Smut by farmers. See *Blight.*

15. Uredo Caricis; *Carex Blight.* Powder black, naked, encompassing the seeds.—Found upon the fruit of different species of Carex, especially the Pilulifera.

16. Uredo Tragopogi Pratensis; *Goat's-beard Blight.* Powder copious, brownish-purple.—Found in summer upon the receptacles of Tragopogon.

17. Uredo Violacea; *Violet-coloured Blight.* Powder of a violet purple.—Found in the antheræ of flowers. This is probably only a disease of the flower.

Urena; a genus of the class Monadelphia, order Polyandria.—Generic Character. *Calix:* perianth double; outer one-leafed, five-cleft; segments wider; inner five-leaved; leaflets narrow, angular, permanent. *Corolla:* petals five, oblong, wide at the tip, blunt with a point, narrower at the base, growing to the tube of the stamina. *Stamina:* filamenta numerous, united at bottom into a tube, free at top; antheræ roundish. *Pistil:* germen roundish, five-cornered; style simple, length of the stamina, ten-cleft; stigmas headed, hairy, reflexed. *Pericarp:* capsule roundish, echinate, five-cornered, five-celled, or soluble into five close cells. *Seeds:* solitary, on one side roundish, on the other angular, compressed. Essential Character. *Calix:* double, outer five-cleft. *Capsule:* five-cleft, divisible into five parts, with the cells closed, and one seed in each.—All the plants of this genus are propagated by seeds, which should be sown upon a hot-bed early in the spring. When the plants are fit to remove, transplant them into pots, which plunge into a fresh hot-bed to bring them forward, and afterwards treat them in the same manner as the tender sorts of *Hibiscus.* If the plants be brought forwards in the spring, and afterwards placed in the stove or under a deep frame, they will ripen seeds in the first season, and if they should not, they may be preserved through the winter in the stove, and will ripen their seeds in the following season, after which the plants seldom continue.——The species are,

1. Urena Lobata; *Angular-leaved Urena.* Leaves roundish-cordate, angular, three-glanded underneath. Stalk two feet high, becoming woody towards autumn: it sends out a few side-branches, which are taper, stiff, and have a dark green bark; flowers axillary, solitary, sessile, shaped like those of the Mallow, but small, and of a deep blush-colour. —Native of China and Cochin-china.

2. Urena Reticulata; *Netted-leaved Urena.* Leaves one-glanded underneath, lower ones three-lobed, upper ones fiddle-shaped. Stem shrubby, three-feet high, branched; the branches and footstalks somewhat downy.—Native of South America.

3. Urena Tricuspis; *Three-pointed Urena.* Leaves one-glanded underneath, three-lobed, acuminate; stem rough-haired.—Native of the islands of Mauritius and Bourbon.

4. Urena Americana; *American Urena.* Leaves trifid, entire at the base, their under surface very soft, and finely downy; stem frutescent, round, scarcely scabrous.—Found in Surinam and Barbadoes.

5. Urena Sinuata; *Cut-leaved Urena.* Leaves three-glanded underneath, sinuate, five-lobed; lobes angular, toothletted, obtuse; stem suffruticose, upright, three feet high, with ascending branches; flowers rose-coloured, small, subsolitary, axillary.—Native of the East and West Indies.

6. Urena Multifida; *Jagged-leaved Urena.* Leaves one-glanded underneath, hirsute, five-lobed; lobes oblong, acuminate, gash-toothed; stem much branched; flowers somewhat racemose, yellow. The whole plant is rough-haired. —Native of the Mauritius.

7. Urena Procumbens; *Trailing Urena.* Leaves oblong, sinuate, serrate; stem procumbent; flowers larger than the leaves, saffron-coloured, axillary, clustered.—It is found in sandy places in China and Cochin-china.

8. Urena Viminea; *Rhomb-leaved Urena.* Leaves one-glanded, somewhat rhombed, toothed, hoary beneath.—Native of Brasil.

Urtica; a genus of the class Monœcia, order Tetrandria. —Generic Character. *Male Flowers. Calix:* perianth four-leaved; leaflets roundish, concave, obtuse. *Corolla:* petals none; nectary in the centre of the flower, cup-

shaped, entire, narrower below, very small. *Stamina:* filamenta four, awl-shaped, length of the calix, spreading, each within each calix-leaf; antheræ two-celled. *Female Flowers,* either on the same or a distinct plant. *Calix:* perianth two-valved, concave, erect, permanent. *Corolla:* none. *Pistil:* germen ovate; style none; stigma villose. *Pericarp:* none; calix converging. *Seed:* one, ovate, blunt, compressed, shining. ESSENTIAL CHARACTER. *Male. Calix:* four-leaved. *Corolla:* none. *Nectary:* rudiment of a germen, central, cup-shaped. *Female. Calix:* two-leaved. *Corolla:* none. *Seed:* one, superior, shining.——The species are,

* *Opposite-leaved.*

1. Urtica Pilulifera; *Roman Nettle.* Leaves opposite, ovate, serrate; female flowers in round balls or heads. Stem from eighteen inches to two feet high; annual. The whole plant is thick set with stinging hairs more pungent than the too common Nettles.—Native of the south of Europe; about Tunis, in Barbary; and upon the east coast of England. It has been observed near the quay at Yarmouth; at Aldborough and Bungay in Suffolk; and at Romney in Kent. It is common among rubbish and stones, flowering in July. Sow the seeds in March upon a bed of rich light earth. When the plants are come up, transplant them into beds, or the borders of the pleasure-garden. The seeds ripen in autumn; and if the plant be permitted to scatter them, they will grow without further care.

2. Urtica Balearica. Leaves opposite, cordate, serrate; female flowers in round heads. This is probably a variety of the preceding species, though it is said to differ in having narrow leaves and globular catkins.—Found in Majorca, &c.

3. Urtica Dodartii; *Pellitory-leaved Nettle.* Leaves opposite, ovate, almost quite entire; female flowers in round heads. Root annual; stems much more slender than those of the former, and seldom branching. It flowers in July and August. —Native of the south of Europe.

4. Urtica Pumila; *Dwarf Nettle.* Leaves opposite, ovate; racemes two-parted, very short; root fibrous; stem the height of a finger, simple.—Native of Canada, in watery places.

5. Urtica Grandifolia; *Great-leaved Nettle.* Leaves opposite, ovate; stipules cordate, undivided; racemes panicled, length of the leaves. Root small, brown, fibrous; stem a foot and half high; leaves from five inches to a foot in length, three-ribbed, stalked, flowers at top in a bunch together, brownish, very small, numerous, reticulated. It varies from a foot in height to four feet; with leaves to a span in length; with smaller racemes to very large diffused ones, often bigger than the leaves, with white, green, and red flowers, and both sexes on the same plant, appearing in the middle of summer. —Native of the West Indies, in shady moist places: on dry ground it is a lower plant.

6. Urtica Verticillata; *Whorled Nettle.* Leaves opposite, ovate, serrate; flowers numerous, axillary, sessile. Stem a foot high, erect, tender, hairy, especially towards the top, branched at bottom.—Native of Arabia Felix.

7. Urtica Reticulata; *Netted-leaved Nettle.* Leaves opposite, oblong, acute, netted underneath; stipules ovate, entire; racemes panicled. Root perennial.—Native of Jamaica.

8. Urtica Urens; *Small Nettle.* Leaves opposite, elliptic, three or five nerved; racemes almost simple. This is distinguished from the Great Nettle by its humble size, being scarcely one-third of the height of that; its annual, white, fibrous root; and its elliptical leaves, much smaller and rounder, three or five nerved, and scabrous.—Native of Europe, Siberia, and Barbary. It is a common weed in cultivated ground, especially on a light soil, and is a great pest of gardens, where it often seeds twice in a season.

9. Urtica Laxa; *Loose-stalked Nettle.* Leaves opposite, ovate, acuminate, serrate; flowers dicœcious; males peduncled, crowded; females in racemes. The stems are from three to five feet high, smooth; pale, roundish, branched; the branches loosely spreading and zigzag.—Native of Hispaniola.

10. Urtica Betulæfolia; *Birch-leaved Nettle.* Leaves opposite, cordate, roundish, serrate; stipules entire; flowers in racemes; stem prostrate, ascending.—Native of Hispaniola.

11. Urtica Diffusa; *Diffused Nettle.* Leaves opposite, ovate, acutely serrate, hispid; stipules rolled back; racemes panicled, longer than the leaf; stems procumbent.—Native of Jamaica, on stony mountains.

12. Urtica Rufa; *Rusty Nettle.* Entirely hirsute: leaves opposite, oblong, serrate; stipules roundish, permanent; racemes terminating; stem suffrutescent, branched, shaggy with rusty hairs.—Native of Jamaica.

13. Urtica Dioica; *Great Nettle.* Leaves opposite, cordate, sharply serrated; racemes very much branching, in pairs, mostly dicœcious; stipules ovate, distinct, spreading. Root perennial, creeping, tough, yellowish, sending down from the joints some pretty large fibres; stems many, from two to four feet high, upright, very little branched, bluntly quadrangular, each side furrowed. The whole plant is pubescent, and covered with stinging bristles; the flowers dispersed in small clusters, commonly dicœcious, but often moncœcious. The seed is small, of an attenuated oval shape, compressed like a lens, of a pale whitish colour: the two calix-leaves serve it instead of a pericarp.—It is remarkable that in this numerous genus all the species do not sting, as the three species which are natives of this country never fail to do. The small projecting prickles or bristles with which they are covered are tubular, and stand on a bag filled with a poisonous juice: they are perforated at the point, and when gently pressed in a vertical direction, the poison ascends the tube, and enables the point to lodge it in the skin, creating considerable irritation and inflammation. Nettles have been employed as a rubifacient, a practice which was termed *Urtication,* and found of advantage in restoring excitement in paralytic limbs, or in torpid and lethargic affection. The juice of the plant itself, and of the Dock, are immediate remedies for the sting. The plant was formerly used as an astringent, but is now disregarded. A leaf put upon the tongue, and pressed against the roof of the mouth, will commonly stop bleedings at the nose. Paralytic limbs have been restored to their usual functions by stinging them with Nettles; and the young shoots or tops are gathered early in the spring, to boil in broth or gruel. The young leaves, eaten in the spring, are not a bad substitute for spinach; they remove obstructions; and the roots operate by urine. The juice of the leaves, taken alone, or boiled with sugar into a syrup, is an excellent medicine for spitting of blood, and other hæmorrhages. A conserve made of the flowers and seed is good for the stone in the kidneys; and a decoction of the root is good in the jaundice, and makes a useful gargle for sore throats. The Nettle is refused by quadrupeds in general, the ass excepted; and even cows will eat it after it has been cut and become a little withered. It is cultivated for the food of milch cows in Sweden: and the leaves are chopped small, to mix with the food of young turkeys and other poultry. This plant is the only food of the caterpillars of three of our most beautiful butterflies; the *Atalanta, Paphia,* and *Urticæ;* the principal food of the *Io;* and the occasional food of the *Comma Album;* the caterpillars also of the *Urticata* and *Verticalis* moths feed on it: a great number of other indiscriminate feeders devour its foliage;

and the base of the leaves in autumn are frequently disfigured by tubercles which contain small maggots producing *Musca Urticæ*.—Common throughout Europe, as well as in North America and Asia, flowering in the middle of summer. The growth of Nettles is general throughout this country, particularly in strong fertile soils, where, on every bank, ditch, and place, which cannot be reduced to tillage, they are produced in such abundance, that the quantity, if collected, would be of great magnitude. The cultivation of them might be encouraged in such waste places, or a vast quantity of land of that description might, at a moderate expense, be made to produce a valuable crop of a useful article heretofore regarded as a nuisance. The shady places in woods, parks, and coppices, are particularly favourable to their growth, and they are accordingly found in such situations in the greatest perfection. The harl or fibre of this plant is very similar to that of Hemp or Flax, inclining to either, according to the soil and different situations in which it grows; and it has been shewn by experiment, that they may be used for the same purposes as hemp or flax, from cloth of the finest texture down to the coarsest quality, such as sail-cloth, sacking, cordage, &c. Another use, of great magnitude, is the application of the fibres of Nettles to the manufacture of paper of various qualities. For the purpose of writing and printing papers, the Nettles might be gathered twice in one season; as for these purposes an extraordinary length of staple is not required, and the fibre would be increased in its fineness; and in point of colour, the prudent use of bleaching would render them a delicate white, without injuring them. The most valuable sort, in regard to length, suppleness, fineness of the lint, brittleness of the reed, which dresses most freely, with least waste of fibre, and yields the greatest produce of fine strong harl, is most common in the bottom of ditches amongst briers, and in shaded valleys, where the soil has been a blue clay, or strong loam. In such situations, the plant will sometimes attain the height of twelve feet, and upwards of two inches in circumference; in general they are from five to nine feet in height; and those growing in patches on a good soil, standing thick and in a favourable aspect, will average about five feet and a half, will work kindly, and the stems are thickly clothed with lint. Those which grow in poorer soils, and in less favourable situations, with rough and woody stems, and have many lateral branches, run much to seed, are stubborn, and work less kindly; they produce lint more coarse, harsh, and thin. In every situation and different soil, the most productive Nettles are found to be those which have the smoothest and most concave tubes, the largest joints, the fewest leaves, and which produce the least quantity of seed. In gathering them, as they are perennial plants, they should not be pulled up by the roots, but cut down, with a view to obtain a second crop where the situation will allow of it, and to secure the propagation of them the subsequent year. The most favourable time for collecting them is from the beginning of July to the end of August; but it may be continued even to the end of October, only the lint of those which remain growing till that time will be less supple, and will not work so freely: and if the season happens to be unfavourable, it is probable there would not be sufficient time to steep and grass them, in which case they should be dried by the heat of the atmosphere, or if the state of the weather would not permit that, then by means of artificial heat; and when dried, they should be housed or stacked till the spring, when they might successfully undergo the same operation of steeping as those of the first collection. Such as grow in grass-fields, where the grass is intended for hay, should be cut when the hay is cut, in order to prevent their being spoiled by the cattle when feeding; the harls of which would be fine in quality, and well suited to be wrought up with the second crop, and which crop may be obtained after those of the first cutting, where the situation will admit of their being preserved. After the Nettles are gathered, they should be exposed to the atmosphere till they gain some firmness, in order to prevent the skin being damaged in the operations of dressing off the leaves, the lateral branches, and seeds, which should be done a handful at a time, and afterwards sorted, viz. those which are both long and fine by themselves, those which are both long and coarse by themselves, and those which are both short and coarse by themselves; then made up into bundles as large as can be grasped with both hands, a convenient size for putting them into water, and taking them out: for this purpose, a place should be previously prepared, and may be either a pond or a pit free from mud, or a brook or river. The bundles should then be immersed, and placed aslant with the root end uppermost; and to prevent their floating on the surface, some weight should be laid upon them. The time required for steeping them is from five to eight days; but it is better they should remain rather too long in the water than too short a time; yet great care should be taken they are not underdone. When the fibre approaches to a pulp, and will easily separate from the reed, and the reed becomes brittle, and assumes a white appearance, that operation is finished. The bundles should then be taken out singly, very carefully, to avoid damaging the fibres, and be rinsed as they are taken out of the water, to cleanse them from the filth they may have contracted; they must next be strewed very thinly upon the grass, and be gently handled. When the surface has become sufficiently dry, and the harl has obtained a degree of firmness, they should be turned repeatedly till they are sufficiently grassed; the time required is known only by experience, so much depends on the state of the weather during the process; when they are sufficiently done, the hard blisters on the stems become brittle; they must then be taken up and made into bundles, and secured from the weather. The harl is now to be separated from the reed, after the manner practised on flax and hemp, either by manual labour, or machinery now in use in those manufactories. The harl being separated from the reed, it requires next to be beaten, that it may become more ductile for the operation of dressing, and which may be performed with such implements as are used in dressing flax or hemp. This operation being accomplished, the produce of the Nettles is arrived at a state ready for spinning, and may be spun into yarn, either by hand, or by machinery constructed for the purposes of spinning flax or hemp, and which yarn may be successfully substituted for the manufacturing every sort of cloth, cordage, &c. which is usually made from hemp or flax; and this new material is particularly calculated for making twine for fishing-nets, equal to the best Dutch twine imported for that purpose, the fibres of the Nettles being stronger than those of flax, and not so harsh as the fibres of hemp. The most favourable condition of the lint, with a view to the paper manufactory, is to begin with it after it is hackled; in order that the fibres may be divested of the skins which enclose them; as, when it is intended to make white paper, having gone through that process would greatly facilitate the bleaching, and render it more easily disencumbered of the gross particles. After the lint is bleached, it should be reduced to a proper length for paper, and then macerated in water after the manner of rags, and undergo similar processes till the substance is converted into paper, which may be easily accomplished by the manufacturers, and made to produce substantial paper of the first

quality.—The Nettle is a formidable root-weed on the sides of banks and ditches, in hedges, in uncultivated places in general, and in pastures; the roots spread very much, and cannot be thoroughly extirpated without the rooting iron.

14. Urtica Caudata. Leaves opposite, cordate; racemes in pairs, quite simple, and very long; which distinguishes it from the preceding species, of which it is suspected to be only a variety.—Found in Tunis, Egypt, and Arabia.

15. Urtica Membranacea; *Wing-stalked Nettle.* Leaves on long petioles; male racemes filiform, membranaceous, naked underneath; females sessile; stem branched.—Native of Barbary.

16. Urtica Rugosa; *Rugged-leaved Nettle.* Leaves opposite, oblong, serrate, nerved, wrinkled; racemelets terminating, diœcious; stem simple, erect. Root annual. The stem a foot high, round, downy.—Native of Hispaniola.

17. Urtica Repens. Leaves opposite, oval, racemes monœcious; stem simple, creeping.—Native of Hispaniola.

18. Urtica Cannabina; *Hemp-leaved Nettle.* Leaves opposite, three-parted, gashed. Root perennial; stems five or six feet high; flowers axillary, in long cylindrical catkins: males on the lower part, females on the upper. It flowers in July, and the seeds ripen in autumn.—Native of Siberia. It is easily propagated, either by seeds or parting the roots; and will thrive in most soils and situations.

19. Urtica Gracilis; *Slender-stalked Nettle.* Leaves opposite, ovate, lanceolate, almost naked; stem and petioles hispid; racemes in pairs.—Native of Hudson's Bay.

20. Urtica Alienata. Leaves opposite, ovate, quite entire, marked with lines. Stem shrubby, rugged, round, stiffish, nearly upright; branches opposite, horizontal, diffused; flowers axillary, sessile.—Native of Ceylon.

21. Urtica Nudicaulis; *Naked-stalked Nettle.* Leaves subterminating, opposite, oblong, acuminate, entire, three-nerved; stem angular, naked below, racemed; flowers diœcious.—Native of Jamaica.

22. Urtica Stolonifera; *Trailing Nettle.* Subcaulescent: leaves opposite, oblong, subserrate; flowers diœcious; runners radical.—Native of Hispaniola.

23. Urtica Parietaria; *Pellitory-leaved Nettle.* Leaves opposite, lanceolate, quite entire, narrower on one side. Roots numerous, long, thready; stem herbaceous, suffrutescent at bottom, from two to eight feet in height, branching very much at the top, erect, angular, four-sided, striated; flowers diœcious, very small.—Native of lofty mountains in the West Indies, flowering all the year.

24. Urtica Ciliata. Leaves opposite, ovate, ciliate, serrate; flowers terminating, aggregate, subpeduncled, monœcious; stem divaricate.—Native of Jamaica.

25. Urtica Radicans; *Parasitical Nettle.* Leaves opposite, cuneate, ovate, crenate, shining; flowers axillary, subsessile; stem and branches trailing, with downy radicals.—Native of Jamaica, in umbrageous forests, where it trails over the trunks of trees, to their summits, thriving plentifully under their shades, also on the rotten trunks of fallen trees.

26. Urtica Ciliaris. Leaves opposite, ovate, ciliate; racemes divaricate.—Native of South America.

27. Urtica Nummularifolia. Leaves opposite, orbicular, crenate, hirsute; flowers terminating, clustered, monœcious; stem filiform, simple, creeping.—Native of Jamaica.

28. Urtica Depressa. Leaves opposite, roundish, crenate, smooth; flowers terminating, clustered; stem creeping, subdivided.—Native of Jamaica.

29. Urtica Hermiarioides. Leaves opposite, roundish, entire, terminating in fours; flowers monœcious, distinct; stem filiform, diffused.—Native of Hispaniola.

30. Urtica Serrulata. Leaves opposite, lanceolate, serrate, smooth; peduncles axillary, shorter than the leaves; flowers in little heads, monœcious; stem frutescent, four-cornered.—Native of Jamaica.

31. Urtica Lucida. Leaves opposite, semipinnate, shining; peduncles axillary, longer than the leaf; flowers in little heads, stem frutescent, angular.—Native of Jamaica.

32. Urtica Microphylla. Leaves ovate, acute, quite entire, with smaller ones ovate, opposite, and intermixed; flower diœcious; stems almost simple, ascending.—Native of the West Indies, in waste or watery places, or on old walls, &c. flowering all the year.

33. Urtica Trianthemoides. Leaves opposite, oblong, quite entire, the alternate ones greater; flowers monœcious; stem erect, branched.—Native of Hispaniola.

34. Urtica Cuneifolia. Leaves opposite, cuneate, obovate, toothed at the top, the alternate ones larger; racemelets peduncled; flowers monœcious.—Native of Jamaica.

35. Urtica Spicata. Leaves opposite, ovate, acute, serrate, smooth; spikes capillary, interrupted; stem round, purple, smooth; branches filiform, hispid at the base.—Native of Japan, near Nagasaki.

36. Urtica Macrophylla. Leaves opposite, roundish, doubly serrate; flowers panicled; stem four-cornered, grooved, purplish; flowers axillary, panicled.—Native of Japan.

37. Urtica Rhombea. Leaves opposite, quite entire, subrhombed, three-nerved; stem herbaceous, a foot high, erect, much branched, smooth, leafy; racemes branched, axillary, length of the petals.—Found in Mexico.

38. Urtica Virgata. Leaves opposite, ovate, serrate, three-nerved; spikes axillary, solitary, interrupted.—Native of the Society Islands.

39. Urtica Ferox. Leaves opposite, hastate, cordate, bristly, serrate; racemes in pairs, divaricate; stipules cordate.—Native of New Zealand.

40. Urtica Chamædroides. Leaves opposite, subsessile, ovate, serrate; glomerules axillary, sessile, subglobose, reflex; stem stimulose; stings white, very conspicuous.—Grows in the islands of Georgia.

** *Alternate-leaved.*

41. Urtica Lappulacea; *Bur-nettle.* Leaves alternate, ovate, scabrous; flowers terminating, subsessile, monœcious; seeds three-cornered; stem diffuse.—Native of Jamaica.

42. Urtica Sessiliflora. Leaves alternate, lanceolate-ovate, crenate; racemes very short, axillary; flowers monœcious, distinct; stem distinct.—Native of Jamaica.

43. Urtica Elata. Leaves alternate, ovate, acute, serrate; stem arboreous; branches almost naked, racemiferous; flowers diœcious.—Native of Jamaica.

44. Urtica Æstuans. Leaves alternate, cordate; racemes dichotomous; fruits orbicular, corymbed; stem simple, a foot high, round, with unarmed prickles: a branch and peduncle from each axil.—Native of Surinam.

45. Urtica Argentea. Leaves alternate, elliptic-lanceolate, entire, glaucous underneath; spikes axillary, solitary, interrupted.—Native of the Society Islands.

46. Urtica Ruderalis. Leaves alternate, cordate, ovate, bluntly serrate; panicles axillary, divaricate, corymbed.—Native of the Society Isles.

47. Urtica Heterophylla. Leaves ovate, entire, and three-lobed, serrate, toothed; stem upright, angular, naked; raceme glomerate.—Native of the East Indies.

48. Urtica Capitata. Leaves alternate, cordate; glomerules in spikes.—Native of Canada.

49. Urtica Divaricata. Leaves alternate, ovate; racemes compound, divaricate.—Native of Virginia and Canada.

50. Urtica Canadensis; *Canada Nettle.* Leaves alternate, cordate, ovate; aments branched; distichs erect; root perennial; stems two feet high. The plant is at first male only, but afterwards male and female flowers are produced on the same plant.—Native of Canada and Virginia. It may be increased by parting the roots in the spring, and will endure the severest cold of this climate in any soil or situation.

51. Urtica Hirsuta. Leaves alternate, cordate, ovate, serrate; racemes compound; stem and petioles rough-haired.—Native of Arabia.

52. Urtica Interrupta. Leaves alternate, ovate, cordate, serrate, somewhat shorter than the petiole; spikes solitary, interrupted. Stem herbaceous, annual, two feet high, roundish, hispid, red, sometimes creeping.—Native of China and Cochin-china.

53. Urtica Nivea; *Chinese* or *White-leaved Nettle.* Leaves alternate, suborbicular, sharp at both ends, tomentose beneath. Stem herbaceous, biennial, erect, round, five feet high; flowers axillary, in loose aments, and not succeeded by seeds in England, where it flowers in August and September. Thread and cordage, even of the larger kind, for shipping, are made of Nettles in Japan. Different sorts grow wild upon the hills there, and frequently attain a considerable size. The species most used are this and the 58th species, Japonica. The bark properly prepared (see directions under the 13th species,) produces strong cordage and threads, so fine that even linen is made of them: it also makes very durable nets; and at Otaheite, from the bark of one species of Nettle, which the natives call *Erowa*, they make the best fishing lines in the world, such as will hold the strongest and most active fish. The Japanese express an oil from the seeds of this species.—Native of the East Indies, China, Cochin-china, and Japan. It may be increased by parting the roots in May. The plants should be set in pots filled with light earth, housed in winter, and exposed to the open air only for three months, in the heat of summer. It is a handsome plant.

54. Urtica Baccifera; *Berry-bearing Nettle.* Leaves alternate, cordate, toothed, prickly; stem shrubby; female calices berried. This is a small tree, from sixteen to eighteen feet high, simple, except at the top, where it is subdivided, scabrous, and prickly; racemes cauline, many-parted, prickly, red; flowers at the ends of the branchlets, sessile, diœcious; seeds small and black.—Native of the West Indies, upon lofty mountains, and in shady places, flowering in spring.

55. Urtica Capensis. Leaves alternate, cordate, crenate, pubescent underneath; spikes interrupted; stem erect, round, scarcely pubescent, harmless.—Native of the Cape.

56. Urtica Frutescens. Leaves alternate, oblong, cusped, snow-white underneath; stem suffruticose, erect, purple; branches alternate, from erect spreading.—Native of Japan.

57. Urtica Stimulans; *Buffalo Nettle.* Leaves alternate, oblong, attenuated towards the base, entire; panicles axillary. The leaves of this small shrub sting like our common Nettles, but much more violently. On every vein are sharp-pointed hollow prickles, containing the fluid which produces the irritation. The Japanese call it Kamadu, and the Dutch colonists, Buffelblad or Buffalo-leaf, because it is customary with the Javanese princes, on holidays, by way of diversion, to turn out a tiger and a buffalo to fight, in an area fenced in with planks. When the buffalo is tardy in attacking his adversary, he is flogged with this plant, which causes such a heat and inflammation in his skin, that he soon becomes quite outrageous. When any one is stung with this Nettle-tree, they anoint the part with oil, or with rice boiled to a soft consistence, as water would only render the pain more intolerable.—Native of Java.

58. Urtica Japonica. Leaves alternate, cordate, villose; flowers glomerate, headed; stem four-cornered, grooved, erect, pubescent. It differs from the 48th species, in having a pubescent stem; hairy leaves unequally serrate; and subglobular little balls of flowers. Thick ropes and cables for ships are made of the bark of this Nettle.—Native of Japan.

59. Urtica Muralis. Leaves alternate, ovate, three-nerved, pubescent, serrate; heads axillary, sessile. Stem round, pubescent, hoary at top; leaves an inch and half long, not stinging.—Found on the walls of coffee-gardens in Arabia.

60. Urtica Villosa. Leaves alternate, cordate, rough-haired; globules sessile. Stem herbaceous, round, scarcely a span high; branches alternate, spreading very much, with globules of small sessile flowers scattered over them.—Native of Japan.

Usteria; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* perianth one-leafed, four-toothed, permanent; segments four, obtuse, three of them very small, the fourth much larger, lanceolate. *Corolla:* one-petalled, funnel-form; tube narrow, longer than the calix; border four-toothed, acute, erect. *Stamina:* filamenta one, short, placed on the tube; anther arrow-shaped. *Pistil:* germen oblong, superior; style capillary, longer than the corolla; stigma quite simple, corrugated. *Pericarp:* capsule oblong, compressed, two-grooved, two-celled, two-valved. *Seeds:* imbricated in two rows, oblong, clothed with a thin membranaceous aril. Essential Character. *Calix:* four-toothed, with one segment much larger than the rest. *Corolla:* funnel-form, four-toothed. *Capsule:* two-celled, with inflexed partitions. *Seeds:* imbricated, winged.——The only species is,

1. Usteria Volubilis. Stem shrubby, with long, slender, opposite, round, twining branches, supporting themselves on the neighbouring plants; leaves opposite, roundish, ovate, quite entire; flowers in terminating panicles. The negroes know this plant by the name of *Makbòt*, and sometimes cure fevers with an infusion of the leaves and young branches. The bark when first chewed is sweet, but afterwards bitter. —Native of Guinea, especially of Sierra Leone.

Utricularia; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth two-leaved; leaflets ovate, concave, very small, equal, deciduous. *Corolla:* one-petalled, ringent; upper lip flat, obtuse, erect; lower bigger, flat, entire; its palate heart-shaped, prominent between the lips. Nectary horned, produced from the base of the petal. *Stamina:* filamenta two, very short, curved in; antheræ small, cohering. *Pistil:* germen globular, large; style filiform, length of the calix; stigma conical. *Pericarp:* capsule globular, large, one-celled. *Seeds:* numerous, small, attached to a large globular receptacle. Essential Character. *Corolla:* ringent, spurred. *Calix:* two-leaved, equal. *Capsule:* one-celled.——The species are,

1. Utricularia Alpina; *Alpine Bladderwort.* Nectary awl-shaped; leaves ovate, quite entire. Roots fibrous, ash-coloured, with small round tubercles, as in the potato; scape simple, leafless, one or two flowered, smooth, erect, half a foot high; flowers elegant, very large, white, with the calix and nectary slightly tinged with yellow; they appear in February.—Native of Martinico, upon wet open meadows in the highest mountains.

2. Utricularia Foliosa; *Fennel-leaved Bladderwort.* Nectary conical; fruits drooping; radicles destitute of appendages, creeping.—Native of South America.

3. Utricularia Vulgaris; *Common Bladderwort,* or *Hooded Milfoil.* Nectary conical; scape few-flowered. The fibrous floating roots, slightly attached to the stem, are supposed to

be perennial; the stem floats horizontally under water, alternately divided into two capillary branches; with bristly leaves, bearing little compressed curved bladders, open and bearded at the tip, containing a bubble of air, and a drop of watery fluid, in which, when highly magnified, appears a quantity of extreme minute solid particles: aquatic insects frequently inhabit these bladders. The stalk rises erect, only a few inches above the water, and is rendered conspicuous by its large spike of handsome alternate yellow flowers.—It is a perfectly aquatic plant, not very common in Great Britain, but found all over Europe, in ditches and stagnant waters; flowering after midsummer.

4. Utricularia Minor; *Small Bladderwort*, or *Hooded Milfoil.* Nectary keeled, very short, obtuse; root capillaceous, very tender, floating, loaded with very small membranaceous bladders; scape length of the fringe, simple, very slender, dividing towards the top into three peduncles, having a bracte under each. This agrees in appearance with the foregoing species, but is not half the size.—Native of Europe; flowering in July. Found in Great Britain, in the river on Hounslow Heath; upon Hinton, Feversham, Fulbourn, and Chippenham moors; in Gamlingay bogs, Cambridgeshire; St. Faith's bogs, Norwich; at Causton decoy, Yarmouth; at Ampthill and Potton marshes, in Bedfordshire; near Glastonbury, Somersetshire; on the turfy bogs of Westmoreland and Cumberland; and in various boggy places in Scotland.

5. Utricularia Obtusa; *Blunt-horned Bladderwort.* Nectary bent in, obtuse, subemarginate; root capillary, branched, whitish; flowers terminating, alternate, three or four, small, yellow, on long one-flowered peduncles. It very much resembles the preceding species, but is distinct from it by having a blunt subemarginate nectary.—Native of Jamaica, in marshy rivulets; flowering the whole of the summer.

6. Utricularia Subulata; *Awl-shaped Bladderwort.* Nectary awl-shaped; leaves capillaceous; flowers small, bright yellow.—Found from Canada to Carolina.

7. Utricularia Gibba; *Gibbous Bladderwort.* Nectary gibbous. Floating.—Native of Virginia.

8. Utricularia Bifida; *Cloven Bladderwort.* Scape naked, bifid; racemes double; flowers alternate, yellow, with the upper lip sharp at the sides.—Native of China.

9. Utricularia Capillacea; *Hair-like Bladderwort.* Scape naked, capillary, three-flowered; flowers nodding; capsule awl-shaped; plant scarcely an inch high, with a naked root, somewhat branching.—Native of the East Indies.

10. Utricularia Cœrulea; *Blue Bladderwort.* Scape naked; scales alternate, wandering, awl-shaped; flowers few, terminating, subsessile, with a spur the length of the flower.—Native of Ceylon and Malabar.

11. Utricularia Stellaris; *Starry Bladderwort.* Bladdery whorl of the bractes ciliary; roots capillary, branched, whorled, floating, but without bladders. In the middle of the scape, and at the surface of the water, are from four to six ovate, ciliate, two-celled follicles in whorls, in order to support the scape in the water.—Native of the East Indies.

12. Utricularia Recurva; *Recurved Bladderwort.* Leafless: nectary recurved; spike simple; root fibrous, short, without bladders; stem four inches high, slender, quite simple, erect; corolla yellow, with a conical nectary.—Found in Cochin-china.

13. Utricularia Aurea; *Golden Bladderwort.* Leafless: nectary conical, compressed; flowers in racemes; corolla golden coloured, with a convex emarginate throat, and a conical compressed nectary.—Native of Cochin-china, in slow-flowing rivers.

14. Utricularia Ceratophylla. Scape with leaves vesiculose, cylindrical, divided at the tip, ramentaceous; racemes of from six to ten flowers, larger, but resembling those of the third species, yellow. This is the largest of the American species.—Found from the lower part of the Delaware to Florida, floating.

15. Utricularia Fibrosa. Nectary obtuse; scape subunifloroust; leaves setaceous; stems purple; flowers orange.—Grows in the morasses of the Pine-barrens of Carolina.

16. Utricularia Biflora. Nectary subulate; scape subbifloroust; leaves setaceous; flowers small, yellow.—Grows on the margin of ponds, in Lower Carolina.

17. Utricularia Purpurea. Nectary carinate, very short; segments of the corolla rotundate; scape two and three flowered; flowers bright purple, small.—Found floating on the lakes and ponds of Carolina.

18. Utricularia Cornuta. Nectary subulate; lip of the corolla inferior, very large; scape biflorous; flowers large, bright yellow.—Grows near mountain lakes, from Canada to Virginia, in calcareous soil.

Many other species of Utricularia are described by botanists, several of them natives of New Holland.

Uvaria; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* perianth three-leaved, flat; leaflets ovate, acute, permanent. *Corolla:* petals six, lanceolate, sessile, spreading, longer than the calix. *Stamina:* filamenta none; antheræ numerous, truncate, oblong, covering the germen, on which they are placed. *Pistil:* germen ovate; styles numerous, length of the antheræ, terminating the head; stigmas obtuse. *Pericarp:* berries numerous, distinct, globular, peduncled, fastened to an oblong receptacle. *Seeds:* numerous. Essential Character. *Calix:* three-leaved. *Petals:* six. *Berries:* numerous, pendulous, four-seeded.——The species are,

1. Uvaria Zeylanica. Branches trailing; leaves lanceolate, acuminate; peduncle one-flowered, solitary; petals roundish, obtuse, equal; corolla dusky red. This shrub has no tendrils, but it climbs by means of a long unarmed branching stem.—Native of the East Indies.

2. Uvaria Lanceolata; *Lance-wood Uvaria.* Leaves lanceolate, quite entire; flowers axillary, solitary; branches wand-like; berries soft, small, one-celled, containing only one seed.—This is a native of Jamaica, where it is reckoned one of the best timber-trees in the island, especially where strength or elasticity is required, but it rarely grows to any considerable size. It is imported for the shafts of light carriages, under the name of Lance-wood.

3. Uvaria Cerasoides; *Cherry-fruited Uvaria.* Leaves lanceolate, acute, pubescent beneath; peduncles one-flowered, solitary; petals ovate, acute, equal. Trunk erect, long, and perfectly straight; branches spreading, horizontal; branchlets two-faced.—This large tree is a native of the inland mountainous parts of the Circars, and does not cast its leaves and flowers during the hot season. The wood is used for many purposes by the natives, who eat the ripe berries, which are good, though astringent.

4. Uvaria Suberosa; *Cork-barked Uvaria.* Leaves oblong, acute, smooth; peduncles one-flowered, solitary; the three inner petals lanceolate. Trunk remarkably straight, with a scabrous bark, very deeply split in various directions; branches horizontal, two-faced. This is more common than the preceding species, though it seldom reaches the size of a tree, except among the mountains. It is in flower and fruit all the year, and does not cast its leaves; the wood also is preferred to the former, being more useful, durable, and elastic.—Native of the East Indies.

5. Uvaria Tomentosa; *Downy-leaved Uvaria.* Leaves oblong, acute, tomentose; peduncles one-flowered, solitary; the three inner petals ovate. Trunk straight, of a considerable height and size; branches numerous, horizontal, forming a very large shady head. It flowers during the hot season.—Native of the Circar mountains.

6. Uvaria Odorata; *Sweet-smelling Uvaria.* Leaves ovate, lanceolate; peduncles one-flowered, solitary; petals linear-lanceolate, very long.—Native of Java and China.

7. Uvaria Monosperma; *Capsuled Uvaria.* Leaves elliptic, acuminate, ferruginous beneath; peduncles one-flowered, aggregate; petals ovate, acute; fruit a one-seeded elliptic capsule.—Found in the remote woods of Guinea.

8. Uvaria Lutea; *Yellow Uvaria.* Leaves oblong, acute, shining; peduncles three-flowered, solitary; petals ovate, obtuse. Trunk remarkably straight, with the bark dark-coloured and pretty smooth.—This is rather a large tree; it flowers in the hot season, does not cast its leaves, and grows only among the mountains in the East Indies.

9. Uvaria Ligularis. Leaves ovate, acute; peduncles many-flowered, solitary; petals linear, acute, very long.—Native of Amboyna.

10. Uvaria Longifolia. Leaves lanceolate, curved at the edge; peduncles umbelled; petals lanceolate, acute. Branches smooth, with a purple bark, a little flexuose at the top; receptacle the size of a Coriander seed.—Native of the East Indies.

11. Uvaria Japonica. Leaves oblong, acuminate, serrate; peduncles one-flowered, solitary; petals roundish. Stem frutescent, twining, decumbent, tubercled with scars, nodding at the top, naked, rufescent; branches alternate like the stem, almost naked, nodding, branchletted. This is distinct from all the other species: it is remarkable on account of the great quantity of clear mucus which it contains. When the twigs are deprived of their outer bark, and placed in a glass of water, the mucus exuding expands itself round them for about the thickness of a line and upwards, and appears as clear as crystal. This mucus is sometimes used for the manufacturing of paper, instead of that which the Japanese extract from the Hibiscus Manihot; and their females also use it to make their hair appear smooth and glossy.—Native of Japan.

Uvularia; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* petals six, inferior, oblong-lanceolate, acute, erect, straight, very long; nectary an oblong groove in the base of each petal internally. *Stamina:* filamenta six, short, rather broad; antheræ vertical, longer than the filamenta, erect, oblong, about half the length of the corolla. *Pistil:* germen superior, roundish; style one, divided half way down into three parts, thread-shaped, longer than the stamina; stigmas simple, reflexed, longitudinally downy. *Pericarp:* capsule ovate-oblong, triangular, three cells and three valves each, with a central partition. *Seeds:* several, nearly globular, with a tunicated scar. Essential Character. *Corolla:* of six upright petals, inferior. *Nectary:* a chink in the base of each. *Stamina:* shorter than the corolla. *Stigmas:* reflexed. *Capsule:* triangular, of three valves, with central partitions. *Seeds:* several, globose, with a tunicated scar. *Observe.* The genuine species are perennial herbaceous plants, with alternate, simple, undivided, simple-ribbed, entire leaves; flowers axillary or terminal, solitary or umbellate, drooping, yellow, whitish, or brown. They are all evidently allied to *Fritillaria*, but have not flat seeds, nor are the stamina equal in length to the corolla.——The species are,

1. Uvularia Perfoliata; *Pale Perfoliate Uvularia.* Leaves perfoliate, elliptical, obtuse, with a small point; corolla bell-shaped, rough on the inside; anthers pointed. Root of several spreading, pale fleshy fibres; stem solitary, annual, twelve or fifteen inches high, erect, round, smooth, leafy; flowers terminal, solitary, pendulous, on short stalks; petals three-quarters of an inch or an inch long, of a pale greenish buff colour; the inner surface rough with yellowish protuberances.—Native of North America, in shady woods, among rocks, in rich vegetable mould, from Canada to Carolina, flowering in May and June.

2. Uvularia Flava; *Small Yellow Uvularia.* Leaves perfoliate, elliptic-oblong, bluntish, waved at the bottom; corolla tapering at the base, rough on the inside; anthers pointed. This appears to be a very distinct species from the preceding. The point of the anthers is longer and more conspicuous; the flower is larger, more taper, and elongated, with narrower sharper petals, one inch and a quarter long, yellow, with orange-coloured granulations on the inner side.—It is found flowering in May and June, in shady woods on a sandy soil, from New Jersey to Lower Carolina.

3. Uvularia Grandiflora; *Large Yellow Uvularia.* Leaves perfoliate, oblong, acute, wavy at the base; petals smooth on both sides; anthers almost pointless; nectary roundish. This is nearly twice the size of the last, and flowers at least a month earlier. The flowers are of a brighter yellow.—It is found in a fertile soil, and amongst rocks, on shady hills, from Canada to Carolina, flowering in June.

4. Uvularia Sessilifolia; *Sessile-leaved Uvularia.* Stem smooth, purplish; leaves sessile, elliptic-lanceolate, glaucous beneath; petals smooth on both sides, rather spatulate, with a greenish oblong nectary, and no roughness; nectary oblong; capsule stalked; antheræ very slightly pointed. The size of this species, and the pale colour of its flower, most accord with the first species; but its essential difference from all the preceding consists in the leaves being sessile, not at all perfoliate.—It is found in shady woods, from Canada to Carolina, flowering in May and June.——All the foregoing species thrive in moist shady borders of bog-earth, with a portion of loam, and, as the herbage dies down to the root, will survive ordinary winters in England.

5. Uvularia Puberula; *Downy Uvularia.* Stem rather downy, reddish, besprinkled with loose hairs; leaves sessile, ovate, rounded at the base, having strong ribs, connected by conspicuous transverse veins, green on both sides, embracing the stem: petals smooth on both sides. It is distinguished from the fourth species, the petals being larger, though in like manner smooth on the inside, tapering at the upper part into an acute point. The flower-stalks and style are hairy; antheræ linear, pointless, like those of the third species.—Found on the loftiest mountains of Carolina.

6. Uvularia Hirta; *Hairy Uvularia.* Stem round, a foot high, erect, the thickness of a quill, and clothed with long dense hairs; leaves clasping the stem, alternate, spreading, heart-shaped, oblong, pointed, seven-ribbed, two inches long, clothed with very short hairs; flowers not observed.—Grows in Japan, near Jedo.

7. Uvularia Cirrhosa; *Tendril-leaved Uvularia.* Stem round, jointed, striated, smooth, simple, erect; leaves sessile, linear, each ending in a tendril, two from the same bud, smooth, a finger's length; flowers from the same bud as the leaves, stalked, drooping; foot-stalk reflexed, single-flowered, the length of the nail; petals six, oblong, yellow, nearly an inch long; filamenta half that length, white; antheræ oblong, two-lobed, within the flower; style one, rather shorter than the corolla, but longer than the stamina; stigmas three, reflexed.—Found in Japan.

Uvularia. See *Hypoglossum.*

WACHENDORFIA; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* inferior, permanent, withering, irregular, of six obovate-oblong petals; three upper ones most erect, of which the two lateral ones have each a spur at the base; the three lowermost widely spreading. Nectary in the spur of each lateral petal, accompanied by a bristle. *Stamina:* filamenta three, thread-shaped, divaricated, declining, curved upward, shorter than the corolla; antheræ oblong, incumbent. *Pistil:* germen superior, roundish, with three furrows; style thread-shaped, declining; stigma simple, tubular. *Pericarp:* capsule three-lobed, triangular, obtuse, of three compressed cells, and three valves, enveloped in the faded corolla; partitious from the centre of each valve. *Seeds:* solitary, rough or hairy, compressed. Essential Character. *Corolla:* inferior, irregular, of six petals, two of them spurred at the base. *Capsule:* of three cells. *Seed:* solitary, rough.—The plants of this genus produce an agreeable variety among other potted plants of the green-house kind in exotic collections. They may be increased by offsets, taken from the heads of the roots in the beginning of autumn, planting them in pots filled with soft loamy earth, mixed with a little sea-sand, and, when the season proves dry, placing them so as to have only the morning sun, until the offsets have taken new root, when they must be placed in a sheltered situation, so as to have the full sun. On the approach of frosts they should be placed in frames, and managed like other tender plants. They may sometimes be propagated by root-suckers, and seeds.——The species are,

1. Wachendorfia Thyrsiflora; *Tall-flowering Wachendorfia.* Leaves perennial, smooth, numerous, two-ranked, plaited, many-ribbed, tapering at each end, sheathing, permanent; panicle oblong, close, racemose, erect, a span or more in length, compound, downy, composed of numerous large and handsome, but inodorous and short-lived flowers, of a fine golden yellow, externally downy, with an orange or tawny hue. The lobes of the capsule are much compressed and sharp-edged; seeds clothed with shaggy chaffy pubescence. The root is perennial, fleshy, saffron-coloured or red, with long simple fibres; stem solitary, simple, erect, leafy, round, or a little compressed, downy, slightly zigzag, about a yard high.—It is a native of the Cape, flowering in May and June, and will thrive in our green-houses with little care.

2. Wachendorfia Paniculata; *Spreading Panicled Wachendorfia.* Leaves annual, smooth, deciduous; panicle spreading. Stem a foot high. The knobs of the roots are browner, oblong, and nearly vertical, and the flowers larger and handsomer, than those of the preceding species; of a deeper orange at the outside, their three upper petals marked with a transverse green or brownish line, and all nearly equally spreading, though the central one is rather smaller than the other two.—Native of the Cape. This species is very impatient of cold, and seldom flowers in this climate.

3. Wachendorfia Hirsuta; *Narrow-leaved Hairy Wachendorfia.* Leaves linear-sword-shaped, hairy; panicle somewhat oblong. The narrowness of the leaves, and the remarkable length of their long shaggy white hairs, distinguish this species. The stem and panicle are rather more hairy than in the preceding species, and the form of the panicle is more elongated and less corymbose; flowers large and handsome, bright yellow, externally tawny; their central uppermost petal concealed in front by the two next which meet before it: they are all broadish-ovate, and shaggy at the back.—Native of the Cape.

4. Wachendorfia Brevifolia; *Short-leaved Hairy Wachendorfia.* Leaves elliptic-sword-shaped, hairy; panicle spreading. The shortness of the leaves, compared with their great breadth, distinguishes this species; and the two lateral upper petals nearly conceal the central one seen in front. It flowers in March or April.—Native of the Cape.

5. Wachendorfia Tenella; *Linear Smooth-leaved Wachendorfia.* Leaves linear, three-ribbed, smooth; panicle spreading, somewhat compound.—Native of the Cape.

6. Wachendorfia Graminea; *Grass-leaved Wachendorfia.* Leaves sword-shaped, channelled, smooth; panicle spreading, compound. The inflorescence is hairy; the branches of the panicle racemose, and somewhat zigzag; flowers yellow, tawny on the outside; germen very hairy. The hairiness of the germen is common in a greater or less degree to the whole genus.—Native of the Cape.

Wake Robin. See *Arum.*

Waldsteinia; a genus of the class Icosandria, order Digynia. Essential Character. *Calix:* in ten segments, the alternate ones smaller. *Petals:* five. *Styles:* club-shaped, deciduous. *Seeds:* two, obovate, without awns.—— The only species is,

1. Waldsteinia Geoides; *Avens-like Waldsteinia.* Stem ascending, round, striated, rather hairy, the length of the radical leaves, which are stalked, five-lobed, ribbed, somewhat hairy; their lobes obtuse, slightly three-cleft, toothed; stem-leaves three-lobed, deeply toothed; stipulæ oblong, acute, entire; flower-stalks two or three, terminal, thread-shaped, very long; flowers yellow. It is distinguished by the small number of pistils and the club-shaped deciduous styles, from *Geum,* to which it is allied; and differs in number of pistils, form of styles, and habit, from *Potentilla.* It is a hardy perennial, flowering in June and July.—Native of the umbrageous forests of Hungary.

Walks, Gravel, and *Grass.*—The former is a dry firm walk in the garden or pleasure-ground, formed of different materials, such as gravel, sand, &c. and, where these cannot be procured, with powdered coal, sea-coal ashes, and powdered brick, but sand or gravel is always preferred. Sea-coal ashes are better than powdered coal or brick, as they bind very hard, and never stick to the feet in frosty weather: and they are better than most other substances for wilderness walks. In forming these walks, when they have been marked out, the earth should be taken away to a certain depth, that the bottoms may be filled with lime-rubbish, coarse gravel, flint-stones, or other rocky materials, to prevent weeds from growing through the gravel, as well as to keep away worm-casts. It should be laid ten inches or a foot thick, over which the coat of gravel should be six or eight inches, which should be very fine, but not riddled, the larger stones only being taken out. When the gravel has been laid to this thickness, they must be exactly levelled, and raked true from all great drips, as well as little holes: by this means most of the stones will be raked under the feet, which may either be evenly sprinkled back over the last length that is raked, or buried in the bottom. Sometimes the surface of the walk is so much rounded that it lessens the effect of their breadth, and renders the walking upon them unpleasant. The usual allowance for a walk of five feet breadth, is about an inch rise in the crown: consequently, if twenty feet wide, it will be four inches higher in the middle than on each side; and for twenty-five feet, five inches; for thirty feet, six inches; and so on in the same proportion. When the walk has been carefully laid, trodden down, and raked, either in lengths, or the whole together, it should be rolled well both in length and crossways; the person who rolls, wearing shoes with flat heels, that may not make holes, as when they are once made in a new walk it is not easy to roll them out

again. In order to lay them firm, it will be necessary to give them three or four rollings, after good waterings or heavy rains, as this will cause the gravel to bind; so that when they become dry, they will be as hard as terrace. Iron-mould gravel is said to be the best for binding, or such as has a little binding loam amongst it; which latter, though it be apt to stick to the heels of shoes in wet weather, binds better than any thing else in dry weather; but when the gravel is over-sandy or sharp, clay is frequently mixed with it, which, when cast together in heaps, and well mixed, binds like a rock. Walks of this sort are not only necessary near the house, where they certainly should be largest, but one should be carried quite round the garden, because they dry soon after rain, and are always proper for walking upon. The walks laid with sand or other materials, in the other parts of gardens or pleasure-grounds, should be formed in the same manner, taking care to adopt every precaution according to the nature of the soil, so as to render them as dry as possible at all seasons. The breadth of these walks should be regulated by the nature of the ground; six feet in small, and from that to twelve feet in large grounds. In modern grounds, they are generally laid in winding directions, to render them as private as possible, by trees and plants on each side, and the turns are contrived to appear as easy and natural as possible. In forming *Grass-walks*, different methods are pursued; but it is always necessary first to level the ground, and by treading and raking to make the surface firm as well as even. In small walks, it is common to have them laid with turf brought from some neighbouring waste, beating it well down at the time, so as to form a close smooth even surface. But where they are of considerable extent, it is mostly found more convenient and proper to have the sward formed by the sowing of them with proper grass-seeds at suitable seasons; in doing which they should be sown in rather a thick and regular manner, and the seed be raked into the earth in an even way, the surfaces being afterwards, when quite dry, rolled regularly with a moderately heavy roller, in order to render their upper parts level, and to cover the earth or mould well over the seeds. All walks in general may be said to be useful, when they are required for the separation of the ground into quarters, beds, and borders, and serve to connect and lead to the different parts, or from one to another cross-wise: and where kitchen-gardens and pleasure-grounds are connected, the principal walks should be of a more capacious nature, having handsome borders on the sides, such borders being intended for small esculent plants, as well as those of the flower and ornamental kinds. Leaves and weeds should on no account be suffered to remain on the walks, which they soon spoil.—When the surfaces of Walks become foul, mossy, or full of weeds, the gravel, &c. should be turned, which is best done early in the spring, by means of digging them up to a slight depth, placing the upper surface downwards, and then treading, raking, and rolling the whole well down again. Grass-walks should be constantly kept close and clean, by frequent mowings, sweeping, and rolling.—See Vol. I. p. 644.

Walkeria; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in five ovate, acute, concave, spreading, permanent segments. *Corolla:* petals five, lanceolate, acute, spreading, rather longer than the calix. *Stamina:* filamenta five, capillary, ascending, half the length of the petals; antheræ roundish. *Pistil:* germen superior, globular, five-cleft; style bristle-shaped, erect, as tall as the stamina; stigma simple. *Pericarp:* drupas five, obovate-kidney-shaped, of one cell. *Seed:* nut solitary, kidney-shaped, rather bony. Essential Character. *Calix:* inferior, in five deep permanent segments. *Corolla:* of five petals. *Drupas:* five. *Nuts:* solitary, kidney-shaped.—The only known species is,

1. Walkeria Serrata; *Serrated Walkeria.* Leaves evergreen, smooth, and shining, alternate, on short stalks, elliptic-lanceolate, acute, more or less evidently and acutely serrated, four or five inches long, furnished with a strong midrib, and many fine transverse reticulated veins; panicles terminal, with racemose, compound, angular, smooth flower-stalks; flowers yellowish, about half an inch in diameter, without scent; fruit reddish, shining, acid, and bitter, seated on the dark-red enlarged calix. The stem is shrubby, about twelve feet high, with round, smooth, leafy, alternate branches. It appears to possess astringent and tonic qualities.—Native of various parts of the coast of Malabar.

Wall Cress. See *Arabis.*

Wall Flower. See *Cheiranthus.*

Wall Pennywort. See *Cotyledon.*

Wall Pepper. See *Sedum.*

Wall Rue. See *Asplenium.*

Wallwort. See *Sambucus Ebulus.*

Walls—are used in gardening not only for fences, but for the purpose of ripening all such fruit as are too delicate to be perfected without such assistance in this climate. They are composed of stone, brick, earth, &c.; but for fruit-trees brick is the best, as being not only the handsomest, but the warmest for the ripening of fruit, besides being better adapted for nailing than stone, where the joints are larger: hence brick walls with copings of freestone, and stone columns at proper distances to separate the trees, and break off the force of the winds, make not only the most beautiful, but the most profitable walls that can be erected. Those walls are the best, the aspect of which have one point to the eastward of south, as they enjoy the benefit of the morning sun more, and are less exposed to the west and south-west winds, which are very injurious to fruits, than those which are built due south; the next best is due south; and after that, the south-east. But wherever it is necessary to build south-west and west walls, or where such have been already built, the best method is to plant them with such sorts of fruit as require less heat to ripen them: but north walls are only proper for baking-pears, plums, and morello cherries, for preserving; or duke cherries may be planted against them, to continue longer in season. The proper thickness of these brick walls is thirteen inches, or a brick and half: but the thickness should be proportioned to its height; for when they are built twelve or fourteen feet high, the foundations of the walls should be at least two bricks and a half in thickness, and brought up a foot or more above the level surface of the ground of the same thickness: they should there be set off two inches on each side, which reduces them to two bricks; and five or six feet above the surface of the ground, they may be diminished on each side, to reduce them to the thickness of a brick and half, which must be continued to the summit. The piers in such high walls should always be proportionably stronger than is commonly allowed to lower walls; for being more exposed to strong gales of wind, if not well built, they will be very dangerous. The piers should be projected the length of a brick at the back, and the thickness of a brick in the front, and must be ten or twelve feet asunder. It appears however that these lofty walls are seldom wanted, except for Pears, though some think that the garden walls should seldom be built lower than twelve or thirteen feet, and that they never need be higher than sixteen, except where they are connected with hot-house buildings. The ordinary height of *hot-walls* is ten feet, which is sufficient for any of those fruits which

are generally forced; for by forcing the trees, they are usually weakened in their growth, and do not thrive so vigorously as those which are exposed in the open air; and where there is not a quantity of walling planted, sufficient to let one part rest every other year, the trees only last a few seasons, and are never healthy. The foundations of hot-walls should be made four bricks and a half thick, in order to support the flues; otherwise, if part of them rest on brick-work, and the other part on the ground, they will settle unequally, and soon get out of order; for wherever there happens any crack in the flues through which the smoke can make its escape, it will prevent their drawing; and if the smoke penetrate within the glasses, the fruit will acquire a smoky taste, and be much injured. This thickness of the wall need not be continued more than six inches above the ground, where the foundation or bottom of the first flue should be, which will be sufficient to raise it above the damps of the earth: then the wall may be set off four inches on each side, which will reduce it to the thickness of three bricks and a half, so that the back wall may be two bricks thick, which is absolutely necessary, to throw the heat more out in front; for when the back walls are too thin, the heat evaporates. The wall in front next to the fruit should be only four inches thick, which will leave an allowance of nine inches for the flues, which may be covered with twelve-inch tiles; for if they have an inch and half bearing on each side, it will be sufficient. The fire-places should be contrived at the back of the walls, and in proportion to their length, which is usually forty feet to each fire, though fifty may be allowed. They should be shedded over with brick and tile, to keep out the wind and rain, otherwise the fires will not burn equally; and as it is quite necessary to have the fire-places or ovens below the foundation of the first flues, there must be steps down into the sheds, to come to the mouth of them to supply the fuel; of course they should not be narrower than eight feet in the clear. Where the length of walling requires two ovens, they may be in the middle, being included under one shed, to save expense, and allow more room to attend the fires; as, in this case, the shed must be at least ten feet long, but not more than six in breadth, the steps down being at one end. The lower flue, through which the smoke first passes from the fire, may be two feet and a half deep; of course the back wall should be at least two feet and a half thick, as high as the top of this flue, and then it may be set off to two bricks, which must be continued to the top of the wall. The second flue, which should return over the first, may be made two feet, the third a foot and a half, and the fourth one foot deep; which four flues with their coverings will rise nearly eight feet high, so that there will be about two feet left for fixing of the frames at the top to support the glasses, for the coping of the wall: these four returns will be sufficient to warm the air in the frames. But in the carrying up of these walls some strong iron hooks should be well fastened, at convenient distances, projecting about two inches from the wall, to which the trellis must be fastened, which is to support the trees. The flues must be well pargetted with loam on their inside, and loam should be spread under the tiles which cover them, to the thickness of the hooks, that the flues may be very smooth. At each end of these flues small arches should be turned in the back walls, in such a manner that there may be holes opening, to cleanse the flues from soot whenever it has accumulated. The borders in front of these walls should be four feet wide, which will make a sufficient declivity for the sloping glasses; and on the outside of them should be low walls, rising four or six inches above the level of the borders, upon which the plate of timber must be laid, on which the sloping glasses are to rest. The glasses must be divided into two ranges, being contrived in such a manner, as that the upper row may slide down, and be fastened at suitable distances; but the lower may be either fixed or moveable; and the sloping timbers which support the glass-frames, must be fastened at bottom into the ground-plate in the front of the border, and at the top into strong iron cramps, fixed in the upper part of the wall for that purpose. They should be made of fir, which does not twist like oak and some other wood, where it is laid in such a position; and on the top should be fixed in a close manner, a strong board, under which the upper row of glasses should slde, in order to secure the upper part from being raised by the winds, and to keep the wet from the trees. It may project on the top glasses about two inches. The width of the frames may be about three feet, or according to the extent of the wall, the bars being placed lengthways. See *Stove*. Hollow, flued, or forcing walls, are very great acquisitions to fruit-gardens in the northern parts of the kingdom on many accounts; and it is said to be a great improvement in them, not to have the furnaces placed too close upon the walls, or the flues to lead too directly forward to the front, but the former to be kept back before they reach the front brickwork.—Walls in gardens are not only of great utility, importance, and advantage, as serving the purpose of defences against external injuries, and as sheltering against cold cutting winds, high stormy blasts, and all sorts of severe exposure; but also as affording the means of having different sorts of fruit-trees trained against them, for the production of finer, more early, and better perfected fruit. Indeed, without their assistance many of the more tender sorts of fruit-trees cannot be made to mature and ripen their fruit in any full perfection in this climate. The Peach, Nectarine, Apricot, Vine, and Fig, all stand in need of nearly the best full south walls, to produce their fruit in the fullest and finest proportion, having their branches trained in close, in a regular expanding manner, upon them, in order to have the full benefit of their warmth and protection during the time of their early blossoming, and setting their fruits in the spring months; and afterwards to obtain the most complete influence and advantage of the sun in bringing them forward in the most effectual manner to the above-noticed state of maturity, in due season, and with the greatest richness of flavour. Walls are also useful for all the more common hardy sorts of fruit-trees, notwithstanding they are capable of producing good fruits abundantly without the walls, still they are thereby afforded more early and in greater perfection. Where any of the better sorts of these have the advantage of being grown against a south, south-west, or east wall, their fruits become ripe early, and in a perfectly mature manner; and usually the early as well as the latter kinds acquire still more improved states of perfection and fineness of flavour, some of them for immediate eating, others for keeping different lengths of time. This occurs in the principal sorts of Cherries, in the choicer sorts of Plums, the capital sorts of the finest eating Pears, of the summer, autumn, and winter kinds, and in some of the highly valued sorts of the eating Apples of those different seasons. By planting some of the hardy sorts of fruit-trees against walls fully to the south, others against those which have a westerly aspect, and a few on those towards the east and north, the best sorts of their different fruits will be produced in succession, both at an early and late period. Where walls are situated in the interior parts of garden grounds, or near plantations, or near their boundaries, with pieces of ground and boundary fences exterior to them, they may be furnished and planted with

the most choice sorts of fruit-trees on both sides, suiting them to the nature of the aspect, in both the tender and the hardy kinds, some being placed on the full south walls, others on the west and east aspects of them, as well as on their northern exposures; however, in general, allotting those of the best sorts, of the former as well as latter description, to the walls with southern exposures or aspects; as all those of the Peach, Nectarine, Apricot, Vine, Fig, and others of the tender varieties of fruit-trees, as noticed already; and some of those of the finest kinds of Cherries, Plums, Pears, and Apples, in the more hardy fruit-tree kinds. The less fine kinds of all or most of these tender and hardy sorts, but chiefly of the latter, may be planted against the walls which have western or eastern aspects; and those which have northern exposures or aspects may have some of the latter sorts, as summer Pears, Plums, Morello Cherries, and Currants, placed against them for later successional ripening. Experience has now fully shewn, that the crops of fruit are the most abundant, and of the best quality, where the walls, against which the trees are arranged and nailed, are well built in the perfectly straight form, as they protect the blossoms and young fruit in the most favourable manner for the purpose.

Wallenia; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in four erect obtuse segments, permanent. *Corolla:* of one petal, tubular; tube cylindrical, erect, longer than the calix; limb in four, shallow, ovate, obtuse, erect, converging segments. *Stamina:* filamenta four, inserted into the base of the corolla, dilated at the bottom, half erect, as long again as the corolla, and rather spreading in that portion beyond its limb; antheræ ovate, incumbent. *Pistil:* germen superior, oblong; style awl-shaped, shorter than the stamina and corolla, permanent; stigma simple, obtuse. *Pericarp:* berry roundish, of one cell. *Seeds:* solitary, roundish, with a brittle shell. *Observe.* Some male flowers occasionally occur, which have no pistil, rendering the genus polygamous. Essential Character. *Calix:* four-cleft, inferior. *Corolla:* tubular, four-cleft. *Berry:* with one seed.——The species are,

1. Wallenia Laurifolia; *Laurel-leaved Wallenia.* Branches round; they are long, subdivided, as thick as a goose-quill, twining about every thing in their way, marked with scars from the insertion of former foliage; leaves on round smooth footstalks, obovate, obtuse, entire, smooth, shining, slightly ribbed and striated, about four inches long, and almost half as broad in the middle; stipules none; panicle terminal, with spreading, alternate, partly level-topped, subdivided branches. The stem is woody, from ten to twenty feet high, having a smooth bark, and no thorns or prickles; flowers stalked, yellow, inodorous, about half an inch long, numerous, very beautiful; berry scarlet.—It is a native of bushy places, on the mountains of Jamaica and Hispaniola, flowering in spring and autumn.

2. Wallenia Angularis; *Angular-branched Wallenia.* Branches angular, smooth. Leaves larger than in the foregoing species, alternate on the lower part of each branch, opposite, or even whorled, above, all very smooth and shining; panicle terminal, erect, many-flowered, somewhat corymbose, its ultimate divisions umbellate or capitate; flowers green, about the size of the preceding, but the calix seems less deeply divided, more hairy, and the corolla smoother; stigma downy.—Native of the East Indies; and cultivated in the island of Mauritius, where it grows to the height of twenty-five feet, and is as thick as a man's leg.

Walnut Tree. See *Juglans.*

Waltheria; a genus of the class Monadelphia, order Pentandria.—Generic Character. *Calix:* perianth inferior, double; the outer unilateral, of three leaves, deciduous; inner of one leaf, cloven half way down into five acute segments, cup-shaped, permanent. *Corolla:* petals five, inversely heart-shaped, spreading, their claws inserted into the lower part of the tube of the filamenta. *Stamina:* filamenta five, united into a tube, their upper part separate, spreading, short; antheræ ovate. *Pistil:* germen superior, ovate; style thread-shaped, longer than the stamina; stigmas tufted. *Pericarp:* capsule obovate, of one cell, and two valves. *Seeds:* solitary, obtuse, dilated upwards. Essential Character. *Calix:* double; the outer lateral, of three leaves, deciduous. *Petals:* five. *Style:* one. *Capsule:* of one cell, and two valves. *Seed:* solitary.——The species are,

1. Waltheria Americana; *American Waltheria.* Leaves oval, plaited, downy, unequally and sharply toothed: they are alternate, stalked, one to two inches, or more, in length, strongly veined, plaited at the edges, extremely soft on both sides, with dense, hoary, minutely starry pubescence; stipules awl-shaped; heads of flowers stalked; flowers small, yellow, in dense, axillary, solitary tufts, each on a stout, straight, downy stalk, various in length, but usually nearly equal to the corresponding footstalk.—Native of the Bahama islands, and South America. This, the second, and fifth species, may be increased by seeds, which must be sown on a hot-bed; and when the plants are fit to plant out, they must be each removed into a separate small pot, and plunged into a fresh hot-bed, being afterwards treated in the same manner as other plants kept in the bark-stove. In the second year they flower and produce seeds, but may be continued three or four years, if they be often shifted, and the roots pared, to keep them within compass. In order to keep the roots out of the tan, they should be drawn up out of it at least once in six weeks, during the summer season, and the plants may be shifted out of the pots once in two months. With this management the second and fifth sorts may be continued several years, but the first seldom lasts beyond two.

2. Waltheria Indica; *East Indian Waltheria.* Leaves oval, plaited, downy, bluntly toothed; heads of flowers sessile. This is distinguished from the preceding species, by the blunter and more shallow teeth of the leaves, the down of which is less dense, and by the constantly sessile heads of tawny yellow flowers.—Native of the East Indies.

3. Waltheria Lophanthus; *Crested South-Sea Waltheria.* Leaves roundish-heart-shaped, serrated, stalked, clothed with silky pubescence; heads of flowers stalked; bractes imbricated.—Native of the Marquisas.

4. Waltheria Ovata; *Roundish-leaved Waltheria.* Leaves roundish, ovate, acute, unequally toothed, densely downy; they are obscurely lobed, or angular, and one and a half, or two inches long; heads of flowers sessile. The flowers are yellow, some of the lower tufts assembled upon short leafy axillary branches, not nearly so long as the leaves. This is a bushy shrub, three or four feet high, downy, and very soft in every part.—Native of Peru.

5. Waltheria Angustifolia; *Narrow-leaved Waltheria.* Leaves oblong, obtuse, plaited, toothed, hoary, half an inch long, obtuse at each end; heads of flowers neary sessile, supported by very short stalks. Stem shrubby; the whole plant invested with a thin pubescence.—Native of the East Indies.

6. Waltheria Elliptica; *Elliptic-leaved Waltheria.* Leaves elliptic-oblong, obtuse, plaited, downy; they are more downy, and three times as long as in the preceding species; heads of flowers sessile; petals obtuse, not emarginate.—Native of the East Indies.

7. Waltheria Glabra; *Smooth-leaved Waltheria.* Leaves smooth, ovate-lanceolate, bluntish, with tooth-like serratures; heads of flowers alternate, on axillary stalks. The leaves are stalked, oval, somewhat lanceolate, two or three inches long, one and a half or two inches broad, smooth on both sides, paler beneath, seldom pointed; footstalks slender, six or eight lines long; stipules lanceolate, pointed, deciduous; flowers in dense, almost sessile, leafless tufts, ranged alternately on an axillary stalk; outer calix of three very narrow, smooth, deciduous leaves; inner permanent, bell-shaped, very smooth, with long, almost thread-shaped teeth; corolla yellow, scarcely longer than the inner calix; capsule membranaceous, with one seed. A shrub, related in many respects to the first species, but altogether smooth.—Native of Guadaloupe.

8. Waltheria Cordata; *Heart-leaved Waltheria.* Leaves smooth, heart-shaped, sharply and unequally toothed, from one to two inches long, on roughish footstalks, about a quarter of their own length, broadly ovate, bluntish, veiny, but not plaited, paler beneath; stipules awl-shaped; heads of flowers ovate, solitary, on straight axillary stalks; common flower-stalks generally much longer than the footstalks, stout, each bearing a dense head of flowers half an inch long; calix, &c. like that of the preceding. This is distinguished by the smoothness of the leaves and most other parts, from all the other species.—Native of the West Indies.

Warping of Land—is the practice of improving land in particular situations, on the borders of large rivers and channels, into which the sea-tides flow, and where the level of the ground is such as to admit of their being overflowed with facility.—This practice has hitherto been confined to the extensive sea-districts of Lincolnshire and Yorkshire. It has been observed, that the waters of the tides that come up the Trent, Ouse, and Dun, and other rivers of these counties, which empty themselves into the great æstuary of the Humber, are muddy to an excess; insomuch that in the summer season, if a cylindrical glass, twelve or fifteen inches long, be filled with the water, it will presently deposit an inch of muddy matter, which in those parts is called *Warp*. Where it comes from, is a disputed point: the water of the Humber is clear at its mouth, and no floods in the countries washed by the warp rivers bring it, but on the contrary do much mischief, spoiling the warp. In the very driest seasons, and longest droughts, it is found the best and most plentiful. The improvement which warping makes in land, is said to consist in nothing more than merely letting in the tide at high-water, to deposit the warp, or muddy material, and permitting it to run off again as the water falls. But in order to render it fully efficacious, the water must be completely at command, so that it may be kept out and let in at pleasure; consequently there must be not only a cut or canal made to join the river, but a sluice at the mouth of it, formed to open or shut, as wanted; and that the water may be of a proper depth on the land to be warped, and also restrained from flowing over contiguous lands, whether cultivated or not, banks are necessary to be raised round the fields to be warped, and these banks must be from three or four to six or seven feet high, according to circumstances. If the tract be large, the canal which takes the water may be made several miles long, so as to warp the lands on each side the whole way, by means of lateral cuts in any suitable direction: but it is to be observed, that the effect lessens as the distance from the river increases; that is, it requires a longer time for the water to deposit warp enough to produce the benefit. Warping begins in July, and proceeds during the summer months; and as it can only be performed at this particular period, every occasion of having it executed must be embraced. It has been already said, that the land to be warped must be banked round against the river: the banks should be made of the earth taken on the spot from the land; they must be formed so as to slope six feet, that is, three feet on each side of the top or crown of the bank, for every foot perpendicular rise; their top, or crown, being made broader or narrower, according to the impetuosity of the tide, and the weight and quantity of water; and they extend from two to twelve feet: their height is regulated by the height to which the spring-tides flow, so as to exclude or let them in at pleasure. In these banks there are to be more or fewer openings formed, according to the quantity of ground to be warped, and the choice of the proprietor; but in general they have only two sluices, one called the flood-gate, to admit, the other termed the clough, to let off the water in a gentle manner: these are sufficient for ten or fifteen acres. When the spring-tide begins to ebb, the flood-gate is opened to admit the tide, the clough having been previously shut by the weight of the water brought up the river by the flow of the tide. As the tide ebbs down the river, the weight or pressure of the water being taken from the outside of the clough next the river, the tide-water, that has been previously admitted by the flood-gate, opens the clough again, and discharges itself slowly, but completely, through it. In forming the cloughs, they are walled on each side, and so constructed as to let the water run off between the ebb of the tide admitted, and the flow of the next; and to this point the workmen pay particular attention. The flood-gates are placed so high on this account, as only to let in the spring tides when opened. They are therefore, of course, placed above the level of the common tides. Willows are occasionally planted on the fronts of the banks, to break the force of the tides, and defend their fronts with the warp thus accumulated and retained. These trees, however, must never be planted on the banks themselves, as, being agitated by the winds, they would loosen the foundations. The first cost of a sluice for warping fifty acres annually, supposing the sluice to be five feet high and seven in width, will be from £4 to 500. This practice creates a new sort of soil, and it is of but little consequence what the original nature or quality of the land may be, as all kinds of soils, almost without exception, are wonderfully improved by it; but it is confessedly most beneficial in light-soiled, open, porous lands, and to such stiff ones as are deficient in calcareous matter, and require substances of this kind to reduce their tenacity: such soils, when well warped, will remain for a vast length of time afterwards in a high state of fertility. Experienced warpers, however, suggest, as an improvement in this mode of tillage, to apply a small portion of warp whenever the land is in a state of fallow, which will be about every five or six years. The depth to which the land should be covered by the tides, must be regulated according to their levels, and the heights to which the tides rise in the rivers from which they proceed. The effect of warping is very different from that of irrigation: as it is not the water that produces the improvement, but the mud or material which is deposited; hence in the time of floods, and in winter, warping ceases: it is not the purpose of warping to manure, but to create and form the soil. It is, in this point of view, of little or no consequence, as has been above observed, whether the soil be bog, clay, sand, or peat, as the warp will be deposited upon it, in one summer, from the depth of six to sixteen inches, and in the hollows or low places, two, three, or four feet; so as to leave an entirely level surface. Hence a soil of any depth may be formed, which consists perhaps principally of sand,

but is always found to be amazingly fertile. On the coast of Lincolnshire, from Wisbeach to Boston, which through a long succession of ages has formed a large tract of warp country, called the *Silt* district, no attempts have been made to warp artificially. It is therefore suggested, to the proprietors or farmers living near a muddy river, that they should consider the position of their grounds well, and try the amount of the subsidence of the mud in the water, in a cylindrical glass jar, as a great benefit may be near them, and lost from their inattention to this subject.

Wartwort. See *Euphorbia* and *Spurge.*

Waste Lands.—The scarcity of corn, which prevailed throughout Great Britain a few years ago, acted as a powerful stimulus to the enclosure and improvement of waste land, which is now still more necessary, as it affords a large increase of productive labour for the most valuable members of society. The insufficiency of labour for the demand of the country, leaves no danger of old land being at all neglected in order to bring wastes into cultivation; but in the cultivation of waste land, particular circumstances must be considered. Some wastes, from the situation and the quality of their soils, are capable of being brought into a high state of cultivation and improvement, with comparatively little labour and expense; while in others the expense of cultivation would be great, and the profit precarious and inconsiderable. Hence some able judges conclude, that the same quantity of labour and expense, which would be necessary to divide and cultivate such soils, would in all probability raise a much larger proportion of produce from lands already but imperfectly cultivated. It is often said, that our soil and climate are more adapted for producing grass than corn; but the fact is, that the greatest portion is well suited to either, and will amply repay skill and industry wherever exerted. Profitable, however, as this business would entirely turn out, both to the individual and the public, the taste of landholders, in general, is rather to increase their quantity of wilderness, than to improve their present possessions. When, however, a proprietor feels indisposed to improve his waste grounds himself, surely he may find a pleasure in giving liberal encouragement to his tenants, and the labouring poor, to exert themselves to render it productive. The foundation of the encouragement should perhaps be a long lease to poor industrious honest labourers, with a small allowance to build a house, and to help themselves to live, until they can raise food to support themselves; after which they should pay interest for the money, and a small rent for the ground. It would, indeed, be better that landholders should give any encouragement short of their own loss, rather than allow such lands to lie any longer as they are. Waste lands are generally classed under three general heads: *First.* Elevated barren lands, covered with different sorts of coarse plants, which comprehends all the varieties and denominations of moory, heathy, and mountain down, and other such lands, however diversified by the particular circumstances of quality and situation. These circumstances must constantly regulate the modes of clearing the surface, dividing, enclosing, and laying out the lands, as well as the buildings that may be necessary, and direct the kind and extent of the different operations, which are afterwards the best and most proper, and conducive to improvement. Where the land is thin, too much ploughing is mostly to be avoided, though in other circumstances it may, for the most part, be freely adopted, especially where any suitable ameliorating substances are at hand ready to be applied. In the improvement of waste land, where the heath and other coarse plants on the surface are considerable, it is the practice with some, to apply lime in large proportions some time before the ground is to be broken up, as it is found to have great power and effect in destroying such coarse matters, and in preparing the superficial parts of the soil and ground for the operation of the plough, and the action of other tools, for bringing it into necessary cultivation. Objections have been made to the cultivation of Wheat, in the first instance, though that would appear to be the most profitable method of proceeding. This crop should be followed by Turnips, or by Oats, with Ray-grass and Red Clover, though the former is generally preferable, especially if the necessary quantity of suitable manure can be procured in a ready manner; then Barley, with seeds, may be tried in succession to the Turnips, particularly where they succeed in such a manner as to keep sheep a sufficient length of time on the field. The course of the crops will then run thus: Wheat, the stubble carefully turned down in the autumn, then Turnips, and these followed by Barley or Oats, with Ray-grass and Red Clover. The first crop of these grasses, grazed by sheep, or other sorts of live stock, is most convenient. Land thus managed, when broken up a second time, will soon, it is asserted, become equal to any other in the vicinity. It may be necessary, in many cases and for many reasons, to vary the first crop. In some it may be most useful and proper to begin with Turnips; in others with Oats and seeds, or with the former only. In lands where mucilage appeared deficient, Buck-wheat, turned in, has been tried with great success, especially when afterwards mixed with lime and dung. Still the above method of beginning with Wheat is the best in all cases where circumstances will permit it, because Wheat, when the ground is properly prepared, will best repay the expense of such preparation; and green leguminous crops, eaten off by sheep or cattle, will afterwards improve the land considerably, even without other means, which should never be neglected where the expense of providing them is moderate. Heath-land, where the staple is very thin before small stones and gravel are reached, may be improved in somewhat the same way, in some cases; and after the surface materials have been reduced and spread out by nine-share ploughing, sow it with grass-seeds well harrowed in. By this simple method, the sward soon becomes sweet, good, and productive; the heath, which originally covered the ground, soon disappearing. Wastes that are naturally poor, thin, and barren, should seldom have corn attempted to be raised upon them in the first instance. Heath-lands, where the staple is very thin, intended for sheep-walks, may be improved by breast-ploughing, burning, and spreading out the ashes upon a certain proportion of them every year; half of such portion being directly prepared for early Turnips, the other half for the same crop in the spring. The Turnips, on the first part, when fed off on the land by sheep, should have the ground they occupied sown, after being prepared early in the spring, with Tares, in the quantity of three bushels to the acre, with a few Oats, which are also to be fed off with sheep; then sow Turnips again for the spring, which being fed off as before, the land is to be sown with Oats and White Clover seeds, eight pounds to the acre, with a bushel of good hay-seeds. The Clover is not to be in any way stocked, after the Oats are cut, until the spring. This land, by being hurdled off, where practicable, and fed with sheep for two or three years, will, it is said, become an excellent sward, and form a great improvement, affording the improver vast profit in the increase of the sheep it can support. There are other modes of bringing waste lands, of these different kinds, into cultivation; as by planting Potatoes in the ridge, and other methods, which is well suited to the means of improving small portions by the labouring poor, in many instances, as they often produce

good abundant crops, and render the lands soon fit for other purposes without much expense. The sowing of the seeds of leguminous plants among those of the grass kind has been found to ameliorate the soil, and increase the herbage.—The *second* sort of waste land to be considered is, the swampy, boggy, and marshy kind, such as are infested with various descriptions of coarse vegetable productions. This comprises all the sorts and varieties of soft watery land formed by the deposition of different rich earthy, or other such matters, and often is a collection of the rich mud and sediment which is washed down from the higher grounds, so mixed with the recrements of different decayed vegetables of its own growth, and so overcharged with stagnant water, that it hardly affords support for any animal. This sort of waste is generally less susceptible of improvement than heathy moor, or any of the kinds above described, though it generally repays the expense of a successful experiment better than any other, because it is that sort of land, which, when freed from its superabundant moisture, is the richest and most productive; nor is the clearing and cultivation of it in most cases so difficult as is generally supposed. Sometimes the water which overflows it comes from higher grounds, so that it may be easily intercepted, and afterwards made to serve it in the way of manure, by being thrown over the surface. In other cases, the water arises from internal springs, which are easily discovered whenever the land has got an outlet on the lower side of it, to which the water thus produced can be conducted by open cuts, as the muddy and earthy material subsides. It may then be drawn off in the usual way, and the land converted to valuable pasture or corn-crops, as may be most suitable and proper. In this manner, and by the application of proper substances of different kinds on the surface when necessary, many considerable tracts of such sorts of waste land in different parts of the kingdom have been brought into an excellent state of cultivation for the production of corn as well as grass. And besides such advantages, the removal of the stagnant wetness in the lands, in many instances, is of much benefit in promoting the healthiness of the neighbourhood, by removing the cold and putrid vapours which they exhale. Wastes that have much coarse rushy herbage on the surface, and are considerably dry, should be treated as follows: In April and May pare and burn the surface; and after the matters thus produced are spread equally over it, turn the ground up with a very ebb furrow, and sow it at the proper season with Turnips in the broad-cast manner. From the almost entire absence of root-weeds, in consequence of the burning, the crop will require little care in dressing by the hoe. The Turnips are to be consumed upon the ground, by folding sheep upon it by means of flakes or hurdles. As soon as the land is cleared of the Turnips, it is to be ploughed with a good furrow, and to remain in that state until the season for sowing the same crop again arrives. If well worked, and laid into ridges or stitches of the usual breadth of two feet and a half, the dung produced by the sheep that consumed the first Turnip crop, will render the land capable of giving a superior crop of the same kind in the second season. This second crop, like the first, is to be consumed by folding sheep on the land in the same manner; which being finished, the land is to be ploughed and laid into ridges for a corn-crop, which is to be either Barley or Oats, according to its nature and situation. If rich and well-sheltered, they should be cropped with Barley, otherwise with Oats; in either case to be sown off with grass-seeds for pasture. It is conceived, that under this process of management, the smallest possible expense will be incurred, and that the lands, at the end of three seasons only, are thrown into pasture in high condition, while in the course of the process one valuable Corn crop, and one good crop of Turnips, have been afforded, together with a less valuable one of the same sort; which last, however, may be sufficient to defray all the expense of tillage attending it, over and above that of reducing the coarse surface. The expense of preparing for the second Turnip crop, and for the Corn crop, will amount to no more than the price of ordinary light tillage; and the lands, from being brought into the state of grass in high condition, will not only afford abundant profitable pasture, but at the same time be ready, when broken up at a future period, to yield full crops of Corn. In low wet bottoms, it has been found also most beneficial to pare and burn for the same crop to be eaten off by sheep; then to sow Oats, and afterwards to lay on five chaldrons of lime per acre, as a preparative for another crop of Turnips, to be eaten by sheep as before; after which, to sow Oats, with seeds in the quantity of sixteen pounds of White Clover, five pounds of Rib-grass, and a quarter of good hay-seeds, to the acre. Land so managed, it is said, will carry considerably more stock than it did in its original state. If the water has been completely removed, these seeds may be broken up at the end of two years, or as soon as they appear to decline, for Wheat, and be put into the four-shift husbandry, namely, Turnips after Wheat, to be succeeded by Barley, Clover, Turnips, and Wheat again. Until the land becomes tired of Red Clover, there cannot, it is supposed, be a more judicious method adopted for this kind of waste land. When it becomes tired with the Red Clover, which is generally after two successive rounds, either Beans, Peas, or seeds, may be substituted. The two former are ameliorating crops, and will be found beneficial, where such wastes are of a strong quality of soil; the former particularly, where the land is strong enough for Beans. The best substitute for Red Clover in such cases is, small seeds for two years, which removes it from the four into the five shift system.—The *third* class of waste land is, the peaty, mossy, and turfy, of which there are many different kinds, from those of the smallest depths to those of the greatest, however different they may be in their qualities, textures, and other circumstances. As they vary greatly in all these respects, and in the quantities of moisture or wetness, it is obvious there must be a great diversity in the methods of cultivating and bringing them into a state of improvement. As there is almost always a degree of wetness in them, which is unfriendly to the culture and growth of all or most sorts of plants which are objects of the farmer's attention, it is mostly necessary, but especially in those of the deeper kinds, to free them as much as possible from the excess of moistness, as a first step toward their improvement. After this, the surface is to be levelled, consolidated, and rendered more compact, by the application of different sorts of weighty substances of the earthy and other kinds. This is particularly necessary where such wastes are of a fungous open quality, and may be effected by any sort of materials of the above kinds, which are in quantity and at hand. In different cases, sand, clay, marl, and other such matters, may be met with under such waste lands, and answer the purpose effectually at a trifling expense. It has been observed, that the great point in reducing wastes of this kind to corn-lands is, in the first place, to lay them so dry as to favour vegetation, but not to deprive the crops of their necessary moisture. This medium, therefore, must be carefully observed, as the value of such lands is not unfrequently diminished by the last, as well as the first of these opposite causes. This sort of waste land is indeed of so porous a quality, that if entirely deprived of its natural moisture, it is liable to admit

the drought beyond the reach of the dews. Waste land of this kind, several feet deep, is said to be made capable of carrying natural Clover, and other fine grasses, in some cases by no other means than removing the wetness, smoothing the surface, and giving a good covering of ditch-scourings, and the mud scrapings of the sides of the roads. In some cases, this sort of waste resting upon fine clayey or strong loamy bottoms, they are floated away, in case a stream sufficiently strong can be procured, that the rich soil underneath may be brought into cultivation. In other cases, the mossy material is not floated down by a stream of water, but only improved upon the surface; which is done by cutting a large canal or passage on that side the waste next the fall, which is intended to convey the water from the field or land. Smaller ditches are then cast, which form the field or land into ridges, which are made of more or less breadth as the waste may happen to be more or less solid, but all terminating in the great cut or passage. The land of the field is next turned over by digging it; and where Potatoes are to be the first crop, they are planted in the lazy-bed mode across the ridges: but in case the first crop is to be grain, the earth or soil of the ridges is turned over the lengthways of them, or in the direction of the smaller cuts or openings. Some suppose that this kind of waste land is best adapted to raising grass; and that, for that purpose, it should be improved more than for growing of corn. Clover will grow in it, if it be sufficiently dry, and Rye-grass still better, being less delicate. But the sort of grass which suits it best is the Meadow Soft Grass, which grows closely, quickly, keeps the ground well, and is equally fit for hay and pasture. In Lancashire, where extensive improvements of this sort of wastes have lately been effected, and where vast tracts still remain to be improved, in the southern districts, they are first divided into suitable fields or portions by large open ditches, so cut and formed as to be prevented from being forced in by the pressure of the water. They have then smaller covered drains formed in proper directions, for taking off more of the superfluous moisture; the distances of the drains are regulated by the nature of the waste, and the quantity of moisture. Afterwards the surface is levelled, and brought into order, by taking off the coarse, hilly, uneven part, and putting them into large heaps to be consumed in a slow smothering manner, spreading the reduced materials evenly out over the whole, adding a good full covering of clay, marl, or fine limestone gravel, some of which are mostly found under the lands. When they have remained for some time in this situation, they are broken up by a proper plough, contrived and prepared for the purpose, by having the irons in a perfectly sharp condition, and by the coulter being so fixed as to operate without resistance. The horses employed as the team in the first breaking up, and sometimes afterwards, are under the necessity of having pattens put upon their hind feet, as this saves the labour of men, except in particular instances of very soft lands. The great objects as first crops, are Oats, Turnips, Potatoes, and a few others. By these means, this kind of waste is soon got into a profitable state. The tracts of waste in the middle districts are improved by paring and burning, the application of marl and lime, and the breaking up for Oats. In the northern parts of the same county, after a number of large open cuts have been made for taking away the stagnant water, they begin by cutting drains in the land, at nine feet distance from each other, two feet wide, and three deep, below which a deep opening is formed by a long-pointed spade, and left open, while the whole space above is covered and filled. When the surface is levelled where necessary, and the land wholly ploughed over by beginning on the sides of the drains, and laying the furrow-slices well over them, it is well harrowed lengthways of the ridges. Afterwards, when it is practicable, in winter, sand or clay is applied during frost in three or four thousand single horse cart loads per acre, and spread evenly over the surface, to remain till the beginning of spring, when it is well harrowed in, and the land ploughed and sown with Oats. In the next spring, Potatoes are set, in drills four feet apart, using a little littery dung, and they are kept well earthed up; and when removed, are succeeded by Wheat and Rye upon one ploughing. In the winter afterwards the stubbles are ploughed down, and in the ensuing spring a compost of some kind of heavy material is laid on with lime, and the land sown with Barley, which affords good crops.—In different parts of the northern districts of the kingdom, immense tracts of wastes of this kind almost every where occur. In the county of Argyle, for instance, they are said to abound in every parish, and, though capable of cultivation and improvement, are wholly useless, and of little or no value. They are of different depths, as from two or three to eight or ten feet, and differ in size, so that some of them are to be estimated not by the number of acres, but of square miles. They have also in some cases every advantage of situation for manure and markets, vast quantities of limestone being near on one side, and of sand and sea-ware on the other. It is evident, from what has already been effected, that this sort of waste, though of no utility in its usual state, may often be turned to very great account by judicious cultivation: and it has been patriotically suggested, that by rendering the extensive boggy wastes of England, Scotland, and Ireland, fertile and productive, a very great addition would accrue to the real wealth of the nation, and to the means of subsisting its growing population.

Water—is properly distinguished into many different kinds, according to its qualities: as *fresh water*, that which is perfectly insipid, without any saline or peculiar taste or smell, being the fluid in its purest and most natural state, when best suited to every domestic purpose. *Hard water*, is that wherein soap will not uniformly dissolve and diffuse itself, but appears in a curdled form: this shews that the dissolving power of the fluid is lessened; hence it is not so fit for washing, bleaching, dyeing, watering plants and trees, or for culinary purposes. The *hardness*, as it is called, generally proceeds from gas, or the presence of saline matter: in the latter case it may generally be discovered and removed by the addition of small quantities of a solution of fixed alkali; boiling will evaporate the gas, which is also sometimes removed by exposing the water for a considerable time in the open air. River water is soft; but spring water is hard, and remarkable for keeping long without corrupting. *Putrid water*, is exceedingly pernicious, and unfit for any purpose; but may be in a great measure restored by having a current of fresh air passed through it from the bottom to the top: but water of this kind will only serve for manure, and is in some cases very useful. *Rain water*, may be considered as a pure sort of distilled water, but becomes impregnated during its passage through the air with a considerable quantity of putrescent matter, whence arises its great superiority over any other in fertilizing the earth or soil, as well as in promoting the growth of trees and plants. From this quality, however, arises its inferiority for domestic use, when compared with the spring or river kind, even where it can be readily procured; but more especially where it is collected from spouts, tanks, and other contrivances: though on account of its softness it answers some purposes well, after it has been purified by standing. *River water*, is next in purity

to snow or rain water, but for most purposes is superior to either, because it contains more fixed air and less putrescent matter. Of this water, that which runs over a clean, rocky, stony, or gravelly bottom, is by much the purest. But river waters in general are found to putrefy sooner than those of springs, and during their putrefaction they throw off a great part of the extraneous matter they contain, and at length become sweet again, and purer than in their first state; after which they will remain sweet for a long time, as is particularly the case with the water of the Thames; and it is therefore this sort of water that is so useful in irrigation. See below. *Sea water*, is an universal collection of most of the matters in nature, being a diffused solution of various substances, as common salt, bitter cathartic salt, different other saline matters, and a compound of muriatic acid with magnesia, mixed and blended together in a variety of proportions. It is capable of being freshened by simple distillation, without any addition, and is about three parts in a hundred heavier than common water. It appears in some cases to be serviceable when applied to land: indeed it is the muddy material conveyed in a state of diffusion in this water, which is found so beneficial in the warping of land in some cases and situations. See *Warping of Land.*

Water Aloes. See *Stratiotes.*

Water Betony. See *Scrophularia.*

Water Caltrops. See *Potamogeton* and *Trapa.*

Water Chickweed. See *Montia.*

Water Cress. See *Sisymbrium.*

Water Dock. See *Rumex.*

Water Dropwort. See *Oenanthe.*

Water Germander. See *Teucrium Scordium.*

Water Hemlock. See *Cicuta Virosa.*

Water Hemp Agrimony. See *Bidens.*

Water Horehound. See *Lycopus.*

Water Hyssop. See *Gratiola.*

Watering of Land.—This is a practice of great antiquity, which it is probable the extraordinary fertility afforded by the annual overflowings of the river Nile in Egypt, may have first suggested as the means of improving the lands of other countries. In this country the practice is very ancient, and it unquestionably deserves the particular attention of the farmer and land proprietor. The lands which most readily admit of this mode of improvement, generally lie in low situations, on the beds and borders of brooks, rivers, and streams, or in sloping directions on the sides of hills, to which water can be conducted in an easy and ready manner. It has been stated by different writers on the practice of watering land, that the most proper qualities of the grounds for being watered, are all those which are of a sandy or gravelly friable open nature, as upon such the improvement is not only immediate, but the effects produced more certain and powerful than on any other soils. There are also some strong adhesive sour wet lands, which are likewise capable of being improved by watering, as also may those which contain different kinds of coarse vegetable productions, such as heath, ling, rushes, and boggy and aquatic plants. It must however be constantly remembered, that the more stiff and tenacious the soil to be watered is, the greater command should be possessed over the water. The quality of water, (see the preceding article,) like that of marl or other manures, is a matter of the first importance. It is universally known that water which flows out of a dung-yard possesses a fertilizing quality; and that the washing of sheep-walks, freshly manured arable lands, streets of towns, roads, and other such places, after a long drought, have the quality of fertilization. It appears also equally evident, that the waters issuing in different parts of the kingdom from chalk, limestone, marl, or other calcareous stratum, though perfectly limpid, promote fertility in some districts, as of Wiltshire and Dorsetshire, to an astonishing degree: on the other hand, the waters that ooze out of the peat-bogs, and issue from particular mines, are known to impede the growth of vegetables. Chemistry points out tests and processes to analyze marl, gross manure, and water; but the virtue of water, when considered as a manure, does not reside in a single principle, like that of limestone. Water is capable of suspending not only calcareous earth, but various other manures, of animal, vegetable, and fossil origin; some friendly, and others destructive, to vegetation. Hence a practical man would not entirely trust to the theoretic guidance, while the theory of manures, and especially of watering land, is involved in so many difficulties. The effects of watering are remarkably beneficial in many instances: in Wilts, for instance, it is not uncommon to see lands, where water has been diverted for the purpose of improvement, divided by a hedge or ditch only, the grass on one side of which is of the most luxuriant growth, and on the other so weak as not to reach the height of three inches.—The implements necessary for watering in different circumstances are, first a level, of which the spirit one should be preferred as most accurate. This is necessary for taking the level of the land at a distance, compared with the part of the river or other stream from whence it is intended to take the water, to ascertain whether it can be made to float the part designed to be watered. A proper line, reel, and cutting-iron, are absolutely necessary, and a breast-plough of the best kind to cut turfs for the sides of the channels. The spades to be used in this work, should have the stems or handles considerably more crooked than those in common use, the bit being of iron, about a foot in width in the middle, terminating in a point, a thick ridge running down the middle part, from the top to near the point; the edges, on both sides, being drawn very thin, and kept quite sharp by frequent grinding and whetting; when they are become thin and narrow by wearing, they are used for the smaller trenches and drains. Short and narrow scythes will be required to remove weeds and superfluous grass, during the running of the water in the trenches or other cuts; also forks, and long four or five tined crooks or drags, for pulling out the roots of the sedges, rushes, or reeds, which may obstruct the mains, or large channels. Wheel and hand barrows must be provided for removing the clods and earths to the flats or hollow places; for this purpose they may be made open, without sides or hinder parts: the hand-barrows are used where the ground is too soft to admit of the former, where the clods, &c. require to be removed while the land is in water. But when large quantities of earth are wanted to be removed to any distance, three-wheeled carts will be necessary. Each of the workmen will also need stout large waterproof boots, made so as to admit a quantity of hay or other such materials to be stuffed down all round the legs; with tops so as to draw up half the length of the thigh, and kept well tallowed, in order to resist the running water for any length of time.—The art of watering land may be properly called floating, not soaking or drowning. Soaking the soil similarly to the effects produced by a shower of rain, is not sufficient for the general purposes of watering; nor will damming up the water, or keeping it stagnant upon the surface like that in a pond, or on the fens, produce the desired effect. The latter, it is thought, may be properly termed drowning, because it drowns or covers all the grasses, thereby rendering the plants beneath it certainly aquatic, or the herbage disposed to take on such a change; whereas the herbage of a watered meadow or land should, from the form

and circumstances of the ground, enjoy the full benefits of air and water. Practice has proved, that there is no better method than keeping the water passing over the surface of the land with a brisk current, but not sufficiently swift to wash away the soil, yet in sufficient quantity to cover the roots, without overflowing the shoots of the grasses: hence appears the nicety of adjusting the quantity of water, and that one main drain, to bring the water on the upper side of the land, and another on the lower side to take it away, will not be adequate to all the purposes of such an accurate regulation. If the space between the upper channel or main feeder, and the lower one or main drain, should be wider than is necessary for the due adjustment of the water, so that every part of the space may have enough of the water passing over it, and no part too much, then that space must be divided into smaller spaces by intermediate drains, which may *catch* and re-distribute the water. These, and the ground capable of being watered in this way, have that term applied to them, as they catch and collect the water to re-distribute it; and in well-formed lands are never made more than eight or ten yards apart. As the water is brought by the main feeder upon the higher side of a piece of ground, which slopes towards the main drain, and down which sloping surface the water will very readily run, to persons unacquainted with watering, it does not at first sight appear necessary to make such a number of intermediate catch-drains; but it is proved by experience, that however regular the slope of ground may appear to the eye, the water will find a number of irregularities, force itself into gutters or channels, and defeat the purpose of watering, in the hollow places by an excess, and in the higher ones by a want, of water. It is always necessary, before entering upon execution, to consider fully whether the stream of water to be made use of, will admit of a temporary weir or dam to be formed across it, so as to keep the water up to a proper level for covering the land, without flooding or injuring other adjoining grounds; or if the water be in its natural state sufficiently high without a weir or dam, or to be made so by taking from the stream higher up, more towards its source, and by the conductor keeping it up nearly to its level, until it comes upon the meadow or other ground. And still further, whether the water can be drawn off from the meadow or ground in as rapid a manner as it is introduced. It is essentially necessary to possess a full and complete command of the water; and therefore the best mode is to construct good works in the first instance. Temporary means of making dams and hatches to divert the water from its usual channel, may serve to try an experiment: but every landowner greatly mistakes his own interest, who has recourse to such temporary expedients; because it is frequently more difficult to repair than to renew upon large streams, where the foundations are often destroyed, or very much injured. The same principle holds good upon smaller streams, and even in the feeders and drains of watered land. Wherever the channels are so contracted as to make a fall, or much increase the rapidity of the stream, it is constantly disposed to wear away the sides of the channel, or to undermine the dam. The repairing these defects will require land to be dug away, and wasted each time, besides loss of labour. Hence it will be eventually cheaper to make all such works of masonry. The works being thus well constructed, and the water under full command; the next object is to ensure an equal distribution, and prevent wasting. For this purpose, no part of the land, either in the bed or catch-work mode, should be so formed as to be floated or watered directly from the main feeder, but all the main feeders should be kept high enough to discharge the water into the small feeders with considerable velocity, and through a narrow opening. The motion of water is said to be truly mechanical, and requires a great deal of ingenuity, and a perfect knowledge of lines and levels, to make it pass over the grounds in a proper manner. Each meadow or portion of land requires a different design, unless the cultivator can incur the heavy expense of pairing off banks, and filling up such hollows as may be necessary to reduce it to some regular method, the construction to be varied according to the nature of the ground. this constitutes the difference between the watered meadows or lands of Berkshire, and those of Devonshire; the latter of which are upon small streams carried round the sides of the hills chiefly in catch-work; the former are near large rivers and boggy ground, being thrown up into ridges to create a brisk motion in the water; and also for the essential purpose of drawing off the superficial moisture which might prejudice the grasses, when shut up for feeding or mowing. Where there is much floating to be done with little water, or rather where the great fall of a small stream will admit of its being carried over a great quantity of ground, and used several times, it is desirable to employ it in that way, though that is not a perfect model for watering land; but if it answer the purpose of a coat of manure, it will amply repay the expense. In all cases, losing fall is wasting water. All the drains of watered meadows or lands require no greater declivity than is necessary to carry the water from the surface; therefore the water should be collected and used again at every three feet of the fall, if it be not catch-work. It is sometimes difficult to do this in bed-work lands; but where the upper part of the land is catch-work, or in level beds, and the lower part not too much elevated, it may be done. By collecting and using the water again in the same piece of ground before it falls into the brook or other course, a set of hatches is saved, and it is unnecessary to be very particular in getting the upper part into high ridges, since that part of the land near the hatches generally becomes the best, and the lower end of the field being often the wettest or most boggy in its natural state, requires to be thrown up the highest. If the land be of a dry absorbent nature before floating or watering, it will not require to be thrown up into high beds. It has been suggested, that if grass-land, of the heavier kind, could be ploughed in such a manner as to set the two furrow-slides or sods in a leaning position against each other, with the grass sides outwards, the roots of the grasses would be perfectly dry all winter: the shoots would have the full benefit of the sun, and great advantage from mutual shelter. Upon wet land, this ploughing should be performed in the direction in which the water runs. If the ground ploughed in this form before winter, could be watered towards the spring, so as to give it a good soaking, it might be pressed down again to a level surface with a heavy roller. If these narrow ridges also were crossed with level trenches at every forty, fifty, or one hundred yards' distance, according to the fall of the ground; and these trenches made to communicate with other main trenches, which should run up or down the slope, and supply or discharge the contents of those which are horizontal, such ground might be laid dry or wet at pleasure: and it is supposed land so shaped might be floated or watered all winter with stagnant water, to its great benefit, and probably in the spring too, if the water be changed at frequent and proper periods; for it would only remain in the furrows, where there could be little or no vegetation, and the newly loosened soil of the ridges could not fail to absorb such moisture as would promote the growth of the grass without any danger of putrefaction. The levels must be taken before

a piece of ground be ploughed in this shape, and the earth taken out in cutting the cross-drains, be used in stopping the furrows on the lower side. Perhaps upon wet lands it would be necessary to re-plough them every autumn, or the strong lands might become too solid to receive the same benefit from the practice; and it will be necessary to level the ridges every spring, if the ground be mowed, but if summer-fed, it may as well remain in this form as any other. This easy method of getting land up into ridges, which are very narrow, gives to the surface all that inclination which is necessary for drawing off water, which is thus placed under the same command as in any of the best formed meadows or lands, and a much less quantity will be sufficient than under any other plan of watering. It is supposed that it might probably answer the purpose to float young Wheat, or any other sort of grain, in some cases, by a similar method; and that flat peaty ground, such as the level fens in Norfolk, which are subject to be covered a few inches deep every winter with stagnant water, would be much benefited by ploughing it in this way before the floods commence. Some parts of it would thereby be raised above the water, and vegetate quicker in the spring; and the sedgy matter, growing up in the furrows, would, in a few years, raise them to the same level. The cross-drains, where on a declivity, would serve to catch and re-distribute the water, and the fall from one to the other must be very little. If this method be found not to do for watering, perhaps four furrow-ridges of turf, with a small feeder upon each, may answer all the purposes of a more expensive system. There is always good grass by the side of the feeder, whether the water rushes over it or not, and a meadow or land of this nature would be nothing but feeders. It requires so little elevation of ridge, and fall in the feeders, that the water might soon be used again; therefore a very small quantity would suffice, and if there was a scarcity in the winter, the whole discharge might be stopped, and gradually lowered in the spring. This method would answer all the purposes of complete saturation, which seems to be one of the most essential parts of watering, and might be applied more or less, according to the time of the year. When the water is put on, it is supposed no grasses would sustain any injury by exclusion from the air, for a day or two, at the first application. If these ridges could be elevated but four or six inches above the furrows, it would give the surface nearly the same slope as the wider ridges of common meadows or lands; perhaps it would be better to begin ploughing the furrows wide at the ridge, and very narrow at the furrow, which would leave but narrow spaces for drains. If a piece of turf-ground were ploughed in such ridges by the common way of turning over the furrow, if it were set pretty much on edge, it is thought the grass between would soon cover the whole surface. Perhaps ridges might be made by beginning the two first furrows more apart than the usual width, thus leaving the width of one furrow between the two first, to constitute the channel of the feeder. These ridges should be ploughed up and down, with only three or four inches' fall between the cross feeders; and the water may be brought into use again at every other set of beds. If the ground require to be loosened every year, or every other, or two years or more, it will not be attended with much expense, and there will be no very great inconvenience in mowing ground in this shape, if the sides of the ridges be about a swath wide. It is thought that meadows or lands of this sort might be made for twenty-five or thirty shillings the acre, floated or watered with less water than catch-work, and have many advantages over it; namely, the water would lie more above the surface, would be more at command, and therefore changed more readily, and it may be pent up better to get a good soaking when scarce. This may be done more effectually in turns, and will run drier when the water may be taken off, and does not require much skill in the making or management. All the water will be let through nicks; instead of running over a level edge, which in the first place is seldom made well, and in the next is difficult to keep in repair. This sort of work would, it is thought, have all the advantages of drains and feeders, whereas the same channels are obliged to serve for both in the common catch-work: it would require but very few or no stops, and consequently want but little attendance. The whole of the channels and drains for carrying the water on or off the land, in the constant course and regular quantity which practice proves to be necessary, have two very distinct uses. The first sort, or feeders, bring a continued supply of water, to make the slopes wet; and the latter, by carrying it away, prevent the land from becoming too wet in the time of floating or watering, serving to render it dry when that is finished, and to remove any superfluous moisture arising from the soil, or falling from the clouds. The large ones, which convey the water to the land, and along the main ridge, to supply the others, are sometimes said to be the main feeders; and the branches that run along each ridge and distribute the water down the sides, the floating-feeders. The first operation of floating, or watering, begins at the edges of these feeders; the main feeders being nothing more than channels or courses along which the water must pass, from the places where it can be found, to the places where it is to have its effect. The place of its use lies between the floating feeder and the foot of the slope or drains, which are made in every furrow for the purpose of catching the water; and which are said to be catch-drains, and the large ones which collect the water from these, main drains. Some suppose, that all floating or watering, in large rivers, may be effected without constructing hatches, which are often attended with heavy expenses and many inconveniences. If the land be far enough up the river, nothing more is necessary than to go thither, and cut a channel out of it, which shall be deeper than the bottom of the stream. The water, which will be taken out in this new channel, may be dammed up by the hatches in it, at any place most convenient for bringing it out upon the surface. To turn it into its old course down the river, nothing more is necessary than a hatch at the upper end of the feeder; which, when constructed in this way, will be extremely serviceable in time of floods; for by drawing both the hatches, an entire new channel will be opened, which generally becomes straighter than the original. To contrive the shortest way possible to bring the water upon the ground, it is evident that an obtuse angle is the best calculated for that purpose: it shortens the length of the feeders, facilitates the motion of the water, and preserves that natural warmth which prevents it from freezing in the winter, or stagnating in the summer. It also prevents the accumulation of scum, or whatever floats upon the surface, and enables the floater to distribute the water much more equally on every part of the work, than if it circulated in any other direction. The wind has less power to retard the motion of the surface; and the sediment which should go out upon the beds is less liable to lodge in the bottom of the feeders, and consequently the feeders will be cleared out with much less trouble and expense, especially if there be proper plugs or small hatches to draw up, for the purpose of sending a stream through them. It may appear to some that these hatches are too expensive; but, as is already stated, the best policy is to construct well at first, because

they last the longer. Inclined planes also are absolutely necessary; and to form them between straight and parallel lines, the land must be dug away where too high, and moved to those places where it is too low, to form an even surface. The new-made ground will naturally settle in hollows proportioned to the depth of the loose matter which has been lately put together, but such settlement will not take place until the new ground has been soaked and dried again: hence these defects cannot be removed before the second or third year of watering; it will therefore be more difficult, and require more skill and attention, during the first few years, than at any time afterwards. But however simple the system of watering may appear at first sight, those who enter into the practice, will find it no easy task to give an irregular surface that regular yet various form which is necessary. It is therefore requisite that the designer should have just notions of lines, levels, and angles, as the knowledge of superficial forms will not be sufficient. Accurate knowledge of solid geometry is indispensable, to prepare the land for effectual irrigation.

Water Leaf. See *Hydrophyllum.*
Water Lemon. See *Passiflora.*
Water Lily. See *Nymphæa.*
Water Melon. See *Cucurbita Citrullus.*
Water Milfoil. See *Myriophyllum.*
Water Mint. See *Mentha.*
Water Parsnep. See *Sium.*
Water Pepper. See *Polygonum Hydropiper.*
Water Pimpernel. See *Samolus.*
Water Plantain. See *Alisma.*
Water Purslane. See *Peplis.*
Water Radish. See *Sisymbrium.*
Water Rocket. See *Sisymbrium Sylvestre.*
Water Soldier. See *Stratiotes.*
Water Speedwell. See *Veronica.*
Water Violet. See *Hottonia.*

Watsonia; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* spatha inferior, shorter than the corolla, of two oblong, close-pressed, permanent valves. *Corolla:* of one petal, superior; tube cylindrical throughout, somewhat enlarged, but not spreading, in the elongated throat, curved; border nearly regular, in six deep, flat, spreading, almost equal segments. *Stamina:* filamenta three, inserted into the tube at the origin of the throat, thread-shaped, ascending, shorter than the corolla; antheræ oblong, somewhat parallel, incumbent. *Pistil:* germen inferior, oblong, furrowed; style thread-shaped, longer than the stamina; stigmas three, slender, deeply cloven, spreading, recurved. *Pericarp:* capsule oblong, bluntly triangular, cartilaginous, of three cells and three valves. *Seeds:* numerous, imbricated downwards, angular in their lower part, dilated into more or less of a wing at the upper end. *Observe.* This genus differs from *Gladiolus* in having an almost regular corolla, with a cylindrical throat; narrow, divided, not dilated, stigmas; and angular, scarcely winged seeds. Essential Character. *Spatha:* of two valves. *Corolla:* tubular, with a cylindrical throat; its border in six deep, nearly equal segments. *Stigmas:* three, thread-shaped, deeply cloven, the segments recurved. *Capsule:* cartilaginous. *Seeds:* numerous, angular.——The species are,

1. Watsonia Spicata; *Hollow-leaved Watsonia.* Leaves cylindrical, hollow; they are alternate, and very remarkable for their cylindrical inflated form, gradually swelling upwards, obtuse, with a small point, their surface very smooth, their base sheathing. The bulb is small, round, with a fibrous coat; stem leafy, from eight to twelve inches high; flowers either of a light blue or pale purple colour, very numerous, closely imbricated in a two-ranked tapering spike, with reddish crenate sheaths; corollas regular, expanding more than half an inch.—Found at the Cape of Good Hope, flowering there in January, but here in May.

2. Watsonia Plantaginea; *Plantain-spiked Watsonia.* Upper leaves linear-sword-shaped, many-ribbed, lowermost hollow, compressed; flowers imbricated in two rows; they are either blue or white, very numerous, scentless, forming a dense two-ranked spike, two or three of which are sometimes found on each stem. It differs essentially from the first species in the sword-shaped form of its foliage.—Found at the Cape of Good Hope, in the high-ways, and often near Cape Town.

3. Watsonia Punctata; *Dotted-flowered Watsonia.* Leaves linear-awl-shaped, compressed, few, alternate, spreading in two directions; spike about three-flowered; bulb roundish, depressed; stem leafy, slender, about a foot high; flowers agreeing in size and disposition with those of *Ixia Maculata,* about three in number, of a fine purple, scentless, marked with dotted or beaded veins; their segments regular, elliptical, longer than the tube, three of them rather smaller than the rest; stigmas six, strap-shaped, obtuse, revolute, downy.—Found at the Cape of Good Hope.

4. Watsonia Marginata; *Broad Bordered-leaved Watsonia.* Leaves sword-shaped, with thick callous edges; spike somewhat compound; mouth of the corolla with six teeth. The great size of the plant, its thick-edged leaves, and the copious rose-coloured flowers, smelling like Hawthorn or Heliotrope, render this one of the most desirable and striking of the Cape bulbs. The corolla is regular, with a tube about equal to its border, having a short cylindrical throat; stigmas long, each in two divaricated revolute segments.—This abounds about the Cape of Good Hope, on the Table Mountain, and other elevated ground, flowering from October to December, often in such profusion as to cover the hills as it were with a rose-coloured carpet. It blossoms freely in our greenhouses from June to August, especially when planted in deep pots, and increases rapidly.

5. Watsonia Rosea; *Pyramidal-spiked Watsonia.* Leaves sword-shaped, thickened at the edges; spike compound; mouth of the corolla naked. This is one of the largest of its tribe, being sometimes four feet high: it has been mistaken for a variety of the last, but it is a larger and more stately plant; and its flowers are even of a more beautiful rose-colour: the corolla also wants the six marginal teeth round the mouth, which essentially distinguish that of the preceding species.—Native of the Cape.

6. Watsonia Brevifolia; *Short-leaved Watsonia.* Leaves ovate-sword-shaped, equitant, very short; they are about four, almost perfectly radical, remarkable for being only two or three inches long, though near an inch wide, their edges cartilaginous, though very narrow. The tube, throat, and border of the corolla, are equal in length; mouth naked; stem twelve or eighteen inches high; spike long, erect, simple, or sometimes branched, but not composed of little spikelets; flowers of a tawny red, about the size of those of the fourth species; they are scentless, but more durable than some of their congeners.—Native of the Cape.

7. Watsonia Iridifolia; *Flax-leaved Watsonia.* Throat of the corolla curved, longer than the tube, and rather longer than the acute border; leaves sword-shaped, erect, with a prominent midrib; they are long, both in this and its splendid scarlet-flowered variety, the spathes of which are not much above half the length of the slender tube, which is about two-thirds as long as the greatly-extended, cylindrical, curved,

and strongly deflexed throat; stigmas cloven half way down, divaricated. The variety is preferred, on account of the splendid scarlet colour of its flowers.—Native of the Cape.

8. Watsonia Meriana; *Red Watsonia.* Throat of the corolla curved, rather longer than the tube, and longer than the obtuse limb; tube longer than the spathe; leaves sword-shaped, erect, with a prominent midrib. This large and handsome species is nearly allied to the last, but is distinguished by the blunt segments of its corolla. The real colour of the flowers is a peculiar salmon red, rather than scarlet; but it varies both in colour and size. It flowers with other Cape bulbs in May and June, increasing plentifully by offsets.—Native of the Cape.

9. Watsonia Humilis; *Crimson Watsonia.* Throat of the corolla curved, rather longer than the acute limb; tube the length of the spathe; leaves sword-shaped, erect, with a prominent midrib. This plant is seldom above a foot high. The flowers are of a crimson or rose-coloured hue, and vary in size.—Native of the Cape.

10. Watsonia Rosea-Alba; *Long-tubed Watsonia.* Tube about twice the length of the throat, with which it makes nearly a right angle; leaves sword-shaped, with a midrib. The tube is one and a half or two inches long, erect; throat suddenly deflexed, cylindrical, rather slender, an inch long; segments of the border lanceolate, acute, the length of the throat; antheræ but just projecting out of the mouth of the flower, violet-coloured; stigmas in linear segments. The corolla is either cream-coloured, with rose-coloured tints about the mouth and throat, or flesh-coloured, blotched with scarlet, or all over crimson.—Native of the Cape.

11. Watsonia Aletroides; *Aletris-flowered Watsonia.* Throat deflexed, four times as long as the segments of the limb. The leaves are sword-shaped, narrow, with a central rib not very strongly marked, and several small lateral ones. This elegant species bears numerous drooping flowers, of a rich crimson, sometimes speckled with a darker tint, or with white, and remarkable for their small slightly spreading border, so short in proportion to the long tubular deflexed throat, that they resemble the flowers of an *Aletris* or *Aloe.*—Native of the Cape.

12. Watsonia Strictiflora; *Straight-flowered Watsonia.* Tube thread-shaped, twice the length of the spathe; throat erect, very short, slightly dilated; segments of the border elliptical, obtuse, half the length of the tube; leaves sword-shaped, with a prominent midrib. The stem is about twelve or eighteen inches high, with several shortish taper-pointed leaves at the bottom, and bears about two handsome crimson flowers.—Native of the Cape.

Way Bread. See *Plantago.*

Wayfaring Tree. See *Viburnum.*

Way Thistle. See *Serratula Arvensis.*

Weather.—The great but regular alterations which a little change of weather makes in many parts and sorts of inanimate matter, is fully and strikingly shewn by barometers, thermometers, hygrometers, and other such instruments; and it is probably owing to our inattention, and partly to other causes and circumstances, that mankind, like the animals, do not feel these alterations of the atmosphere in the tubes, chords, and fibres, of our own bodies. The state of the atmosphere, with respect to heat and cold, drought and moisture, fog, fair or foul, wind, rain, hail, frost, snow, and other changes, is a kind of knowledge that will be found of vast importance to the farmer; for it is by means of the atmosphere that plants are in some measure nourished, and that animals properly perform their vital functions. In order to form a proper and consistent theory or doctrine of the weather, it would be necessary to have accounts and registers of it regularly and carefully kept, in divers parts of the globe, for a long series of years. Hitherto, however, such accounts have only been very partial, and the general conclusions drawn from them are, that barometers rise and fall together, even at very distant places, and a consequent conformity and similarity of weather; and that this happens more uniformly, as might be expected, where the places are nearest together. The variations of these instruments are also found to be the greater as the places are nearer to the pole: thus the quicksilver in those at London has a greater range by two or three lines than at Paris, and at Paris than at Zurich; and that at some places near the equator, there is scarcely any variation at all: that the rain in Switzerland and Italy is much greater in quantity, taking it for the whole year, than in the county of Essex, though the rains are yet more frequent, or there are more rainy days, in that county than in either of the aforesaid countries. That cold contributes greatly to rain, and that apparently by condensing the suspended vapours, and causing them to descend; thus very cold months or seasons are generally followed by great rains, and cold summers are generally very wet. Again, that high ridges of country, or mountains, as the Alps and others, and the snows with which they are covered, not only affect the neighbouring places, but even distant countries, which often partake of their effects, and the weather is mostly rainy in their vicinity, both in our own and other countries. The prognostics of the weather, that are formed from other circumstances, are, that a thick dark sky lasting for some time, without either sun or rain, always becomes first fair and then foul; that is, it changes to a fair clear sky before it turns to rain. The reason appears to be, that the atmosphere is replete with vapours, which, though sufficient to reflect and intercept the sun's rays from us, yet want density to descend; and while they continue in the same state, so will the weather, which is on that account commonly attended with moderate warmth, and with little or no wind to disturb the vapours, which have a heavy atmosphere to sustain them, the barometer being generally high: but when the cold approaches, and by condensing the vapours, drives them into clouds, or drops, the way is made for the sun-beams to appear, until the vapour by further condensation forms into rain, and falls in drops. Hence a change in the warmth of the weather is often followed by a change in the wind. Thus, the northerly and southerly winds, though generally supposed to be the causes of cold and warm weather, are in reality the effects produced by the warmth or coldness of the atmosphere. And it is common to observe a warm southerly wind, suddenly changed to the north, by the fall of snow or hail; or to find the wind in a cold frosty morning north, when the sun has well warmed the air, wheel towards the south, and again turn northerly or easterly in the cold of the evening.—The following useful deductions with regard to the weather, are extracted from various sources; and will be found of service to agriculturists. When the evening is red and the morning gray, a fine day may be expected. When there are small round clouds of a dapple gray colour, with a north wind, it may be determined that the weather will continue fine for two or three days; but large clouds appearing like rocks, indicate great showers. When small clouds increase, it is a sign of much rain; but the lessening of large clouds foretells fine weather. In summer or harvest, when the wind has been south two or three days, and it grows very hot, and clouds rise with great white tops like towers, as if one were on the top of another, being joined together with black on the lower side, it is a sign that there will be thunder and rain suddenly.

WATSONIA ROSEO-ALBA,
Long-tubed Watsonia.

WATSONIA MERIANA,
Red Watsonia.

WATSONIA HUMILIS,
Crimson Watsonia.

Published by Henry Fisher Caxton, London, 1823

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And when two such clouds rise, one on each hand, it is high time to make haste to shelter. When a cloud is seen to rise against the wind, or the side-wind, it is a sure sign that when the cloud comes up near you, the wind will blow the way in which the cloud came. It is the same, too, with the motion of a clear place in the sky, when all the parts of it are thick, except one edge. At all times when the clouds look black in the west, it is sure to rain; or if raining, it is sure to continue, whatever quarter the wind may be in: and that, on the contrary, if it should break in the west, it is sure to be fair; and fair weather for a week with the wind at south, is likely to produce a great drought. The wind usually turns from north to south quietly, but comes back to north strong and with rain. Sudden rain never lasts long; but when the air grows thick by degrees, and the sun or moon and stars shine dimmer, it is likely to rain for some time. When it begins to rain from the south with a high wind for two or three hours, and then the wind falls, but the rain continues, it is likely to rain twelve hours or more, and generally rains until a strong north wind clears the atmosphere. When it begins to rain an hour or two before sun-rising, it is likely to be fair before noon, and to continue so all day; but if the rain begin an hour or two after sun-rising, it is likely to rain all day, unless the rainbow be seen before it rains. When mists rise in low ground, and soon disappear, it is a sign that there will be fair weather; but when they rise to the hill-tops, there will be rain in a day or two. A general mist before the sun rises, when near the time of full moon, is a sign of fair weather. When there are mists in the new moon, there will be rain in the old; and if there be mists in the old moon, there will be rain in the new. When the sun rises fiery and red, there will be wind and rain; but when it rises cloudy, and when the clouds soon disappear or lessen, there will be fair weather.—With respect to the seasons, as spring and summer; when the last eighteen days of February, and the first ten days of the following month, are for the most part rainy, the spring and summer may be concluded likely to be so too; and it is also observed, that all the great droughts have begun about that time. With respect to winter, when the end of October and the beginning of the following month are mostly warm and rainy, the two beginning months of the new year are likely to be frosty and cold, except after a very dry summer: but when October and the following months are snowy and frosty, the two beginning months of the new year will probably prove open and mild. Mr. Kirwan gives, from his own observations, the following probable conjectures of the weather: When there has been no storm before or after the vernal equinox, the ensuing summer is generally dry: when a storm happens from any easterly point, either on the 19th, 20th, or 21st of March, the succeeding summer is generally dry: or when a storm arises in the 25th, 26th, or 27th of March, and not before, in any point, the summer is also generally dry. If there be a storm at S. W. or W. S. W. on the 19th, 20th, 21st, or 22d of March, the succeeding summer is generally wet.—Something may be drawn from the habits, cries, and course of animals, in respect of the weather. In summer, when sheep rise early in the morning, it indicates, as a sure sign, either rain or a very hot day: and in all seasons, when they jump and play much about, it is an indication of rain and wind in summer, and of storms in winter. When the sheep lie under a hedge in winter, and seem loath to go off to pasture, bleating much, it is considered as prognosticating a tempest. When sheep are fed with hay in the winter, and leave it in frosty and snowy weather, it is a certain sign of the frost's departure. When rabbits get out to feed early in the morning, it is a sign of rain in the night in summer, and of either rain or snow in winter; and when they get home before dark, it will be a bad night. Hogs appear very uneasy before high winds, and run about squeaking as if they were in great pain. When owls screech, it is a certain sign of rain, generally near at hand; as is also the cry of peacocks and woodpeckers: hence they are sometimes called rain-fowl. When cocks begin to crow while it rains, it is a sign of fair weather. Before a very wet summer, swans and bitterns build their nests very high, and very low before a dry summer. When a raven is observed early in the morning soaring round and round at a great height in the air, it is a sure sign that the day will be fine, and that the weather is likely to set in fair. In summer the bat foretells a fine day by flitting about late in the preceding evening. When the swallows fly high, it indicates warm and fair weather; but when low, and dipping the tips of their wings in water, the weather is likely to be rainy; of which the continued squalling of Guinea-fowl, and the quacking of ducks and geese, are certain signs. The missel thrush sings particularly loud before great storms, and continues to do so until the rain begins; hence it is sometimes called the storm-fowl. In autumn, when flocks of wild geese are seen flying over in a westerly direction, it foreruns hard weather. The early appearance of the woodcock and fieldfare also indicates cold hard winters. When in the time of hay-making the black snails are to be seen stretched along the swathe of the grass, it is a sign of rain; as it also is when frogs look black instead of a golden yellow colour, and croak hoarsely. In autumn, when the dor-beetle is flying about in the evening, the next day generally turns out fine: but when bees keep in their hives, and do not go out as usual, it is a sign of rain.—Conclusions with respect to the weather may also be drawn from vegetables: most plants expand their flowers and down in sunshiny weather, and close them up against rain, and toward the evening, especially at the commencement of their flowering, when the seeds are delicate and tender. This is exemplified in the down of Dandelion, and especially in the flowers of Pimpernel, the opening and shutting of which assists the country people to foretell the weather of the following day. The rule is, when the flowers are close shut up, it betokens rain and foul weather, but the contrary when they are expanded. The stalks of most plants swell, and become more upright, against rain, particularly that of the Trefoil, noticed by Lord Bacon. It is by no means difficult to conceive that vegetables should be affected by the same causes as the weather; they may be considered as so many hygrometers and thermometers, consisting of an infinite number of air-vessels, by which they have an immediate communication with the air or atmosphere, and partake of all its changes. Upon this principle it is, that all wood, even the hardest and most solid, swells in moist weather; the humid vapours easily insinuating themselves into its pores, especially in the lighter and drier kinds, which thereby become applicable to many purposes of art, and may tend in some instances to shew the change of the weather; concerning which the attentive farmer should store up in his mind as many rules as possible, as they will greatly assist him in the performance of his various business.

Webera: a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth superior, of one leaf, divided half way down into five erect, acute, permanent segments. *Corolla:* of one petal, funnel-shaped; tube cylindrical, longer than the calix; limb in five ovate-oblong reflexed segments; nectary a fleshy ring surrounding the base of the style. *Stamina:* filamenta five, very short,

inserted into the margin of the tube; antheræ linear, incumbent, spreading. *Pistil:* germen roundish, inferior; style simple, longer than the tube of the corolla; stigma club-shaped, with ten furrows. *Pericarp:* berry nearly globular, of two cells, crowned with the permanent enlarged calix. *Seeds:* from two to four in each cell, angular. ESSENTIAL CHARACTER. *Calix:* superior, in five permanent segments. *Corolla:* funnel-shaped, five-cleft. *Stamina:* in the mouth of the tube. *Stigma:* club-shaped, with ten furrows. *Berry:* inferior, of two cells. *Seeds:* several, angular.——The species are,

1. Webera Corymbosa; *Corymbose Webera.* Leaves elliptic-oblong, on short thick stalks, entire, coriaceous, very smooth, four inches long, rather acute, with a stout rib, and numerous reticulated veins; their upper side shining, lower paler; corymb terminal, forked, many-flowered; stipules intrafoliaceous, triangular, short, pointed; flower-stalks hairy; flowers three-quarters of an inch long, whitish, agreeably fragrant, turning yellowish as they fade; berries firm, the size of a currant, blackish, sweetish, but not eatable. The stem is shrubby, about the height of a man, with smooth, leafy, somewhat compressed branches.—Found upon sandy ground in the East Indies.

2. Webera Cymosa; *Cymose Webera.* Leaves ovate, pointed; cymes axillary, stalked, many-flowered, convex; flower-stalks downy; corolla half the size of the former; style much longer than the corolla; stigma capitate, cloven; berry the size of Juniper. A tree, with round, downy branches.—Native of the East Indies.

Wedelia; a genus of the class Syngenesia, order Polygamia Necessaria.—GENERIC CHARACTER. *Common Calix:* simple, of four or five large leaves. *Corolla:* compound, radiant; florets of the disk perfect, numerous, funnel-shaped, five-cleft; those of the radius from eight to twelve, roundish-ovate, cloven. *Stamina:* in the florets of the disk; filamenta five, capillary, short; antheræ united into a tube, as long as the partial corolla. *Pistil:* in the same florets, germen minute, imperfect; style thread-shaped, the length of the antheræ; stigma simple or divided: in those of the radius, germen oblong, quadrangular; style thread-shaped; stigmas two, revolute. *Pericarp:* none, the calix remaining unaltered. *Seed:* in the disk, imperfect; in the florets of the radius solitary, obovate, gibbous, crowned with four, five, or ten teeth. *Receptacle:* chaffy, slightly convex; the scales ovate, concave, as long as the florets. ESSENTIAL CHARACTER. *Receptacle:* chaffy. *Seed-crown:* of from five to ten teeth. *Calix:* simple, of four or five leaves.——The species are,

1. Wedelia Frutescens; *Shrubby Wedelia.* Stem shrubby, climbing, with round leafy branches; leaves distinct, stalked, lanceolate, acute, two or three inches long, somewhat serrated, bristly on both sides, the upper rough, with callous points, lower paler; flowers terminal, stalked, solitary, yellow, near an inch broad, with a rough calix, the outer scales of their receptacle looking like a coloured inner calix: seed-crown of ten teeth.—Native of Carthagena in South America, where it flowers in July and August.

2. Wedelia Perfoliata; *Perfoliate Wedelia.* Stem herbaceous, four feet high, angular or furrowed, leafy, branched, often purplish; leaves rhomboid, tapering at the base, perfoliate, three or four inches long, serrated, triple-ribbed, light green, roughish; seed-crown five-toothed; flowers yellow, stalked, much smaller than the foregoing; calix broad, extending far beyond the rays.—Native of Mexico.

Weeds—may be distinguished into the annual, biennial, and perennial, like all other plants; for the term *weed* merely implies that they are useless, and perhaps noxious, and require to be destroyed. The first division comprehends all such as die after perfecting their seeds in the first year. This class is very prolific in seeds, but may be extirpated without any great difficulty. The second class includes all such weeds as live beyond a year, and which perish in the second year after perfecting their seeds. These, like the former, are very abundant, and harder to be rooted out. The third division comprises all those weeds which are capable of continuing many years. Some perfect their seeds annually without being destroyed; while others, less prolific in seeds, have the faculty of reproduction in their vivacious roots; and others increase both ways. Such are the worst of all weeds, and the most difficult to eradicate. There is considerable diversity in the nature and vegetation of different sorts: some sprout forth as soon as they receive a sufficient degree of moisture, sending down their roots, though not in exact contact with the earth; others only begin to germinate when they are deposited and enclosed in a suitable soil, and have the proper influence of the atmosphere; and there are many of these seeds, even of the very small sort, which remain for a considerable length of time in an inactive state, and vegetate on being placed in a favourable situation. The seeds of some are provided, as is the case with Thistles, &c. with a soft feathery material for wings, which convey them from their native places to other lands at a considerable distance. There is also a difference of some consequence in the vivacious roots of weeds: some being branched, others entire; some descending directly downwards, others inclining; some fibrous, others tuberous; some creeping, and others knotted or jointed. The plants we term *weeds*, are not, however, totally useless to mankind; many of them have valuable medicinal, and perhaps other qualities and properties, and some may be applied to uses so as to pay the expense of clearing the ground. Thus Sow-thistle will feed either rabbits or hogs; and the Hog-weed is useful for either pigs or cattle. Horses are fond of young Thistles, when partially dried; and the seed may be prevented from spreading by gathering the down, which makes good pillows; however, there is some danger in trusting them till this stage of their growth, as a high wind frequently disperses them over a whole country. Chadlock, it appears, may be made into good hay, and cows are very fond of it. Nettles, Fern, and the more bulky hedge-weeds, may be collected, and annually burnt, to form their ashes into balls, which are valuable to make a ley for scouring cloths and cleansing linen. The seeds of weeds are eaten in vast quantities by many sorts of birds. It has been observed, that bees have not thriven so well since the extirpation of weeds has been generally attended to in this country. The vegetables termed weeds are more hardy and tenacious of growth than any others: nor is their production inconsistent with the Divine goodness, as displayed in that of the most valuable plants; for myriads of diminutive creatures, enjoying life and animation, are fed and supported by them; while man has the intelligence to select and cultivate such vegetables as are adapted to his use, and proper for his sustenance, and to destroy and extirpate others, thereby appropriating to himself what proportion he may think proper of the earth's surface, which, if he should neglect to dress and cultivate properly, would in some degree revert to its natural state, and severely punish by its barrenness the indolence of its inhabitants.—Every necessary particular concerning the great variety of weeds, will be found under their respective genera; which the reader will easily find by the following alphabetical arrangement of the *principal*, under their English names.

Angelica, Wild. See *Angelica.*

Arsmart. See *Polygonum Persicaria.*

Barberry. See *Berberis Vulgaris.*
Base Rocket. See *Reseda Lutea.*
Bastard Baum. See *Melittis.*
Bear-bind, or *Black Bindweed.* See *Polygonum.*
Betony. See *Betonica.*
Bilberry. See *Vaccinium Myrtillus.*
Bindweed, Great. See *Convolvulus.*
Bistort. See *Polygonum Bistorta.*
Black Knapweed. See *Centaurea Nigra.*
Bladder Campion. See *Cucubalus Behen.*
Blue Bottle. See *Centaurea Cyanus.*
Brambles. See *Rubus.*
Bryony. See *Bryonia.*
Boar, Bur, or *Spear Thistles.* See *Carduus.*
Burdock. See *Aretium Lappa.*
Calves-snout. See *Antirrhinum.*
Campion, Red and *White.* See *Cucubalus* and *Lychnis.*
Carrot, Wild. See *Daucus.*
Catchweed, or Cleavers. See *Galium Aparine.*
Chadlocks, Charlocks. See *Brassica, Raphanus, Sinapis.*
Chickweed. See *Alsine Media,* and *Veronica Hederifolia*
Cicely, Wild. See *Chærophyllum Sylvestre.*
Climber, Great Wild. See *Clematis Vitalba.*
Cockle. See *Agrostemma* and *Lychnis.*
Colt's-foot. See *Tussilago Farfara.*
Coralwort. See *Dentaria.*
Corn Spurrey, or *Yarr.* See *Spergula Arvensis.*
Corn Poppy. See *Papaver Rhæus.*
Corn Crowfoot. See *Ranunculus Arvensis.*
Corn Bindweed. See *Convolvulus Arvensis.*
Corn Marigold. See *Chrysanthemum Segetum.*
Corn Mint. See *Mentha Arvensis.*
Corn Camomocle. See *Anthemis Arvensis.*
Corn Horse-tail. See *Equisetum Arvensis.*
Cotton Grass. See *Eriophorum.*
Couch Grass. See *Triticum, Agrostis, Avena, Holcus.*
Cowbane, Water. See *Cicuta Virosa.*
Cow-grass. See *Melampyrum Pratense.*
Crowfoot. See *Ranunculus.*
Cudweed. See *Gnaphalium Germanicum.*
Dandelion. See *Leontodon Taraxacum.*
Darnel. See *Lolium Temulentum.*
Dee or Dead Nettle. See *Lamium.*
Devil's Bit, Yellow. See *Leontodon.*
Dig Grass, Couch. See *Couch Grass.*
Docks. See *Rumex.*
Dodder. See *Cuscuta Europæa.*
Dog's Mercury. See *Mercurialis Perennis.*
Dwarf Spurge. See *Euphorbia Exigua.*
Dyer's Broom. See *Genista Tinctoria.*
Enchanter's Nightshade. See *Circæ Lutitiana.*
Eyebright. See *Euphrasia.*
Fat-hen. See *Atriplex.*
Fern. See *Pteris Aquilina.*
Field Scabious. See *Scabiosa Arvensis.*
Figwort. See *Scrofularia.*
Fool's Parsley. See *Æthusa Cynapium.*
Friary Blade. See *Ophrys Ovata.*
Fumitory. See *Fumaria Officinalis.*
Furze, or *Gorse.* See *Ulex.*
Garden Sowthistle. See *Sonchus Oleraceus.*
Garlic, Wild. See *Allium Ampeloprasum.*
Golden Rod. See *Solidago.*
Goose-grass. See *Galium Aparine and Spurium.*
Goose-foot. See *Chenopodium.*
Goose Tansy. See *Potentilla Anserina.*
Goulans. See *Chrysanthemum.*
Ground Ash. See *Ægopodium.*
Groundsel. See *Senecio Vulgaris.*
Hard Grass. See *Carex.*
Hare-bell, or *English Hyacinth.* See *Hyacinthus.*
Hawk-weeds. See *Hieracium* and *Crepis.*
Heaths. See *Erica.*
Hedge Nettle. See *Stachys.*
Hellebore, Stinking. See *Helleborus Fœtidus.*
Hemp, Nettle. See *Galeopsis.*
Hemlock, Water. See *Thellandrium Aquaticum.*
Henbit. See *Lamium.*
Herb Bennet. See *Geum.*
Hog-weed. See *Heracleum Angustifolium* and *Spondylium.*
Hop, Wild. See *Humulus.*
Ivy. See *Hedera.*
John's-wort, St. See *Hypericum.*
King's Pear. See *Carex.*
Knapweed. See *Centaurea Scabiosa* and *Nigra.*
Knawell. See *Scleranthus.*
Knot Grass. See *Polygonum Aviculare.*
Lady's Seal. See *Bryonia.*
Lamb's Lettuce. See *Valeriana Locusta.*
Laurel, Spurge. See *Laureola.*
Lousewort. See *Pedicularis Sylvatica.*
Marigold, Corn. See *Chrysanthemum.*
Marigold, Marsh. See *Caltha Palustris.*
May-weed. See *Anthemis* and *Matricaria.*
Meadow Sorrel. See *Rumex Acetosa.*
Melilot. See *Trifolium.*
Mint, Corn. See *Mentha.*
Misletoe. See *Viscum Album.*
Mosses. See *Musci.*
Mouse-ear. See *Cerastium Arvensis.*
Nettles. See *Urtica* and *Lamium.*
Nettle, Hemp. See *Galeopsis Tetrahit.*
Nightshade. See *Solanum Nigrum.*
Orache, Wild. See *Atriplex Hastata.*
Ox-eye. See *Chrysanthemum Leucanthemum.*
Pansy. See *Viola Tricolor.*
Parsley Piert. See *Aphanes Arvensis.*
Parsley, Fool's. See *Æthusa.*
Pilewort. See *Ficaria.*
Poppy, Corn. See *Papaver.*
Ragwort. See *Senecio Jacobæa.*
Ramson. See *Allium Ursinum.*
Rape. See *Chadlock Supra.*
Rattle, Yellow. See *Rhinanthus Crista-galli.*
Red Rattle. See *Lousewort.*
Rest Harrow. See *Ononis.*
Rockets. See *Brassica.*
Rushes. See *Juncus.*
Shepherd's Needle. See *Scandix Pecten.*
Shepherd's Purse. See *Thlaspi.*
Sneezewort. See *Achillea.*
Solomon's Seal. See *Convallaria.*
Sowthistle. See *Sonchus Arvensis.*
Spurrey, Corn. See *Spergula.*
Strawberry, Wild. See *Fragaria.*
Sun Spurge. See *Euphorbia Helioscopa.*
Suffolk Grass. See *Poa Elatior.*
Tansey. See *Tanacetum Vulgare.*
Tare. See *Ervum.*
Thistles. See *Carduus* and *Serratula.*
Winter-green. See *Pyrola.*

Wood Sorrel. See *Oxalis Acetofella.*
Wood Spurge. See *Euphorbia Amygdaloides.*
Wood Sage. See *Teucium.*
Wood Vetch. See *Vicia Sylvatica.*
Wood-peasling. See *Orobus Sylvatica.*
Yarrow. See *Achillea.*

Weeding.—It is needless to state the obvious utility and indispensable necessity of this practice; the means of effecting which are divided into those methods of destroying weeds, while preparing the soil for the seed, and such as are necessary to remove them from among a growing-crop. In the former method, a distinction must be made between root and seedling weeds, which require different modes to remove them: for instance, much labour and expense may be saved by drawing up all the seedling weeds before they have sown their seeds. In gardens, where weeding should be particularly well performed, much may be effected by properly ridging or laying up the ground before the winter sets in, and by breaking it down again early in the spring, laying it level for the crop, for this treatment will greatly diminish the seedling weeds. Their seeds are, however, often brought by the wind, or introduced by using the dung of hogs and horses as manure, which, as well as the stable litter, often contains seeds that vegetate as soon as put into the ground. This shews that raw dung is improper for gardens, where it is generally used to the great expense and trouble of the cultivator. Some gardeners principally use the spade and three-pronged fork, for bringing out root weeds. Common hoes are employed for scuffling over the surface, and the triangular kind for cutting up weeds, moulding up and clearing growing plants, and loosening the surface of the ground for promoting the sprouting of any seeds that may be present, and for many other useful purposes. To these the scuffler is sometimes added in large gardens, for working over the surface of the land; but in the small planted boad-cast sown crops, the weeding can only be well accomplished by the hand. In order to destroy weeds in tillage lands, especially where the ground is greatly over-run with them, a complete winter and summer fallow will be necessary. Rib-fallowing, before the setting in of winter, is recommended to prepare the soil for parting freely with the vivacious roots; the ploughing and harrowing, requisite to tear them up, when the spring drought commences, will cause the inactive seeds to vegetate after rain, and they may be destroyed as they appear. Repeated turnings during the summer will cause them to rise, and be destroyed, while the roots which lie beyond the reach of the plough will be impaired in vigour, not being allowed to exercise their vegetative powers. When winter Wheat, or any crop intended to stand throughout that season, is intended to be sown in such ground, it would be best to sow it in drills, that by stirring the intervals in the ensuing summer, the tendency which most soils have to condense or consolidate too much, when greatly pulverized or reduced in their parts, may be counteracted. If spring seed be intended, the last ploughing should be given to the land before the winter's rain commences, and the field be accurately and fully surface or furrow drained, and laid dry. The influence of the atmosphere, during the winter, will then bring them to that due consistence, on which so much depends; and the soil, as soon as it becomes dry in the early spring, will be in the best order for the reception of the seed at that time, when the weeds will also be effectually destroyed. Where ground has been under any tolerable management, drill culture will for the most part suit all the purposes of a clean fallow, and free the land from weeds. In repeatedly turning the intervals, most of the annual weeds may be attacked in the group, and be expeditiously destroyed as often as they spring up; while the roots of the perennial weeds will be almost, if not altogether extirpated, by turning them up to the heat and drought of summer. The rows should also be hand-weeded, for which purpose the hand-hoe will be found very useful. Drill culture may thus be partially exercised with great advantage. Where alternate courses of tillage and grass crops are adopted, in a course of three years' tillage the second might always be in the drill manner; or if there were manure to spare, to keep a field in good condition in tillage crops for four years, both the second and third might be in the drill method. The first on account of the turf or sward and the last for the sake of sowing the land down with grass-seeds, would be more convenient in the broad-cast state: but the weeding in these cases should not be neglected; the larger weeds especially, and all those which are most prevalent, and most productive of seed, should be taken out by hand-labour, or some such means, when they begin to flower. By such strict care and attention to weeding tillage-land and crops, and stocking the ground with proper perennial grasses when laid to rest, weeds would at length be so much subdued as to be seldom injurious to the farmer. The seeds of annual weeds being indestructible, there is only one mode of extirpating them, which is to put the ground into such a state as to induce them to sprout or germinate, and then to destroy the young plants by harrowing them up, or ploughing them under. This is strictly true; but a writer on Agriculture thinks the ground should be ploughed before winter, and not harrowed, it being better to lie rough through that season, so as to have the greatest extent of surface possible exposed to the action and mellowing effects and influence of frosts; and as soon as it becomes dry, in or about March, it should be cross-ploughed and harrowed well down; many of the seeds and roots will then vegetate, which should be ploughed under in proper time, and the land harrowed again, and this sort of process be repeated as often as necessary: this, it is said, is the true use and manner of summer-fallow in this view, which, to have its full and proper effect, should always, it is thought, be attended to early in the season, when the powers of vegetation are the greatest, and the heat of the sun is powerful; as under such circumstances the greater number of weeds will be brought into a state of growth. It appears that the great defect in the management of summer-fallows, so as to destroy weeds, would be to neglect to work them early in the season, by which omission the vigorous annual seedling weeds are not brought into vegetation in due time; as they will not grow afterwards, until the following spring, but then appear in such abundance as to choke the crops; this is the reason why the Field Poppy, the Corn Crowfoot, the Tare, and many other annual weeds, make such havoc among Wheat, when, by a judicious early working of the fallow, they might have been brought to exhaust themselves in the following summer: for if no Wheat were sown, the seeds of these weeds would often occupy the whole ground; but as seeds can vegetate only once, had this vegetation been brought on in the fallow, and the plants afterwards been ploughed under in due time, none could have appeared in the Wheat-crop. The Turnip culture is also supposed to be peculiarly adapted to the destruction of weeds, because for Turnips the ground must be in early and fine preparation, by which the early weeds are beforehand brought up and destroyed; and any that remain may be eradicated by hoeing. Wet weather is as neeessary as dry to give a summer-fallow its whole effect: for without a soaking of rain after the land is pretty well pulverized, numbers of the seeds of weeds will not vegetate, but remain

and grow amongst the crop: hence the root-weeds are to be destroyed in dry weather, and the seedling ones after rain: and though the land should, after a dry season, be apparently in excellent order for sowing, it will be better to wait the effect of rain, and even give time for the seedling weeds to vegetate, before the seed for the crop be actually sown. From this it is suggested, that the destruction of root-weeds and those of the seedling sort, on corn-land, must be effected upon different principles: the former by working them out of the soil in dry weather only; the latter by pulverizing and reducing the particles of the soil so as to cause the seed to germinate, and appear fully after rain, in order to plough under the young plants: also that frequent ploughings and harrowings are necessary to expose all the seedlings lurking in the soil to the powers of vegetation. It is however conceived, that the ploughings and harrowings of fallow ground should, not immediately succeed each other: time should be given for the consolidation of the soil, which after well harrowing will undergo a slight fermentation, and settle as it were into a mass, after which it will turn up mellow, and the weeds may be rapidly redestroyed. It has always been observed, that when ploughing of a fallow succeeds another too rapidly, it has no effect in destroying the weeds. They should be suffered to spread their leaves a little between the ploughings, taking care not to let them proceed too far, so as to ripen their seeds, or to become too large for the plough to bury them. From this view of the subject, it appears that if a fallow for Turnips be cross-ploughed and harrowed down in the month of March, it will generally lie very well till the beginning of May; and that in general no fallow will want ploughing oftener in such intention than once in six weeks, if sufficient harrowings be given between the ploughings. The particular time most proper for these operations must, no doubt, be determined, not by any general rule, but by local circumstances, experience, and observation. Whenever lands have not been properly improved, weeding will be very expensive: but where lands have been well managed for a length of time, the evil will be lessened; because in such cases, as well as in all others, every course of cropping should render the land cleaner; and that will always follow where the business is properly conducted. The means necessary to be used, are these: Complete and well-managed fallows, as already detailed, when fallows are proper or necessary; the use of such manures only as are free from the quick-roots or seeds of weeds; the careful choice of such seed-grain as is clean; the practice of short tillages, or not taking too many crops in rotation; the practice of attentive weeding, and an active use of the hoe; and the plentiful use of clean seeds of the best grasses and trefoils at the end of the tillage; the weeding of the land when in or at grass, so as not to allow the seeds of any injurious plants to spread themselves; and when the land is again broken up, to pursue such a plan of cropping as will tend most to discourage the growth of weeds. Much might be said upon each of these points, but our limits will only allow us to submit a few particulars to the notice and adoption of the intelligent farmer. Of fallows we have treated above: and proceed therefore to other topics. Fold-yard manure should always undergo a fermentation before it is laid upon the land, to destroy the vegetative powers of any latent seeds which it may contain; it ought therefore to be kept as free as possible in the first instance from the seeds of weeds, and seems best adapted to grass-land, applying only lime and other clean manures to fallows: or if fresh dung must be laid on them, it should be applied so early as to allow the seeds to vegetate, and spend themselves before sowing for the crop. If corn-seed be suspected of containing weeds, they should, whenever it is possible, be dressed out before the sowing. In some places weeding is but imperfectly performed, on account of the difficulty of procuring sufficient hands for such a temporary work. Thistles are in general only cut off, but they should always be drawn up by tongs or other suitable tools, and the other weeds by the hand. The hoe has hitherto been generally used in Turnip-crops only, nor is it likely to extend further, until the drill husbandry becomes more established; as much however should be done in all these ways as circumstances will allow. Although the importance of clean seed is well understood in laying down lands to grass, yet the seeds of Docks are not unfrequently sold with Clover, and those of other pernicious plants with Ray-grass. Docks or Thistles should never be mown or cut off, but rooted up with what are called docking-irons, consisting simply of a forked or clefted spike of iron, which is jagged within the cleft, and fixed to the end of a wooden lever, which being forced down by the hand or foot so as to enclose the root of a Dock or large Thistle, these it will easily bring up, especially after rain. Upon breaking up a turf for sward, unless a Wheat fallow or Turnip crop compose a part of the tillage, the land will be injured, and rendered fouler and more liable to produce weeds: this good practice is too often relinquished for the sake of present profit, under the delusive idea of cleansing the land again next tillage. It is however well ascertained, that land well cleaned by former good management will best bear this deviation; for the fewer weeds it has at breaking up, the less will be the increase of them during the tillage or after-culture of the soil. It is not enough to attend to weeding in the time of tillage-culture only: it is proper that grass fields and lands should be rid of all noxious or unprofitable herbage. The negligence prevailing in some districts with respect to this necessary practice, is disgraceful. Pastures and grass-lands are sometimes so closely covered with large weeds, that the animals turned into feed have hardly room to pick up a mouthful; while the vegetable food, which should nourish good pasture, is absorbed by weeds. It is not uncommon even with those who pretend to pay extraordinary attention to their pastures and grass-lands, to cut down such plants as Dock, Ragweed, Bur, Corn and Sow Thistles, while in flower, which, if done in a rainy time, especially as their vivacious roots extend below the reach of the plough when the land is in tillage, the water descending into the fresh-cut wound of the stem, debilitates the roots, and destroys the growth of the plants for a time, though they are seldom wholly destroyed thereby; but when such rains do not occur, fresh leaves immediately arise to support the roots, and the cutting has little or no effect. They should consequently be pulled up by the roots annually, as soon as possible after the flower begins to form and shew itself, taking advantage of the first shower which happens to fall to soften the ground, and make them draw up more freely. This practice, steadily pursued for a number of years, would cause the deeply fixed perennial roots to weaken and decay. Nor is cutting down the Ragweed of much avail; some of the plants die, but many survive to branch out more luxuriantly in the year ensuing; but this plant is easily pulled up when in flower, especially when the ground is soft, as it is not deep-rooted. The Bur-Thistle may be killed at any time by cutting it under the first leaves: but the Common Dock is the most troublesome plant in grass-land, especially in clayey soils, where it is always most frequent. Every piece of its long tap-root left in the ground will grow, and form a new stem and plant. It should be entirely turned out with the dock-iron, in the manner already noticed, as soon as the

flowering-stem is formed; and as the plants of this kind rise at two seasons, the pasture or grass-fields should be weeded twice in summer, that no seeds may be allowed to ripen. The roots should be fully exposed to the heat and drought; for if in a moist place, they will continue to vegetate on the surface as they lie, and strike out side-roots into the ground. All other useless herbage in pastures, and all seed-bearing weeds by the sides of roads, ditches, brooks, and other such places, should also be cut down when they begin to flower. Farmers in general suppose that the scythe will be early enough to cut them down, but unfortunately their seeds are generally matured and dispersed before mowing-time; and if not, they are carried with the hay to the stall, and mixed with the manure, or into the pasture for fodder during the winter; in both which cases they are sure almost of being planted. Besides, the merely cutting off rather improves than diminishes their growth, by forcing them to throw out new shoots from their roots more abundantly than before. Thus a Thistle, which rises at first with a single stem, if cut off above the surface of the ground, spreads with several lateral branches, and covers a large space of ground. We have already stated, that the proper method is to draw them up while the soil is moist, as practised by all who regard their interest or credit. It has been judiciously remarked, that the negligence of a neighbour often operates as a discouragement: but it is really marvellous that there should be in some districts an almost unanimous encouragement of weeds. In the highways they are left to grow up to maturity, dispersing their seeds in immense quantities all round, as carried by the winds or the winged tribes. Under these circumstances, it is evidently of no use for one, or even all the occupiers of ground, to clear their land of weeds, while this principal source of them is overlooked. One would suppose that the extensive mischief arising from such a cause would create a general combination to remove such nuisances; but as that is seldom the case, would it not, it may be fairly asked, be convenient to incorporate with the duty of surveyors, or overlookers of the roads, the duty of rooting up and destroying such weeds within their respective districts? It is worthy of observation, how completely a patch on a common, from which the turf or sward has been pared, will be covered with Thistles in the very next summer. and with its seeds infest the arable fields in the neighbourhood. In some parts of the country, the weeds in the less heavy tillage lands are destroyed, by an entire and perfect summer fallow every third year, which is an effectual but expensive method of proceeding; but on the strong loams and other heavy soils, by good hoeing and hand-weeding the drilled or set crops of Beans, Peas, and some other kinds. On the sandy and other light loams, by well hoeing and weeding by hand the crops of Peas, Potatoes, Turnips, and some others. As soon as the Peas or Tares are off the land, the ground is ploughed and well harrowed, and the root-weeds picked or raked together, and burned or otherwise disposed of, as noticed above; which is generally repeated after the cross-ploughing and harrowing have been performed. The ground being then in a great measure free from root-weeds, the Turnips are sown, and the seed-weeds that may arise are destroyed by repeated hand-hoeing and weeding. This method, when practised once in every three or four years, will keep light land tolerably clear from weeds. But in the event of a hot dry summer, the labour and expense of raking, collecting, picking, and burning the weeds, may not unfrequently be saved, and the roots destroyed, by only harrowing them to the surface after every ploughing; so as to expose them to the heat of the sun long enough to kill them, which a week's time will effectually accomplish; yet care must be taken that they are quite dead, as they are very tenacious of life, and would be very destructive if they should be removed alive so as to recover. Wherever the depth of the staple or vegetable mould is deep enough to admit of trench-ploughing, it, with the assistance of heavy rolling, will sometimes entirely destroy root-weeds, and often proves more efficacious than any number of ploughings. It is an excellent plan, where it can be executed without turning up a poor barren subsoil. There is, says a sensible writer, what may be termed a public cause of the increase and propagation of weeds, which it is not in the power of any individual to prevent: and this has been slightly alluded to already. This, a slovenly, neglectful, or ill-disposed individual, may promote and increase; and it can only be prevented by a political regulation, for which it appears no provision has yet been made in our political code: thus are the numbers of vigorous and luxuriant weeds, which are suffered to ripen their seeds in our hedges and pastures, woods, and other lands, and the seeds of which being provided with feathery matters, are dispersed over the whole territory of the kingdom, and propagate themselves far and near, growing in whatever places they alight and settle, and producing a most abundant crop; the most common and pernicious of which are supposed to be different sorts of Thistles, Coltsfoot, Groundsel, Knapweeds, &c. For as the seeding and scattering of the seeds of these plants is clearly a public nuisance, and as they are subject to spread to a great distance, injuring all lands indiscriminately, they ought certainly to become the subjects of political regulation. This would be the effectual means of saving much labour and expense to the farmer; and it would eventually be a great benefit to the country. While, however, matters continue as they are, weeding should be begun early in the spring, in the meadows and pasture-lands, as well as in the corn-fields; and then it may be concluded, that the present immense crops of mischievous plants would be at least greatly diminished, to the incalculable advantage of the agriculturist.

Weigelia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth superior, of five awl-shaped, erect, equal leaves. *Corolla:* of one petal, funnel-shaped; tube the length of the calix, internally hairy; border bell-shaped, cloven half way down into five ovate, obtuse, slightly spreading segments. *Stamina:* filamenta five, inserted into the tube, thread-shaped, erect, nearly as long as the corolla; antheræ erect, linear, obtuse, cloven at the base. *Pistil:* germen superior, quadrangular, abrupt, smooth; style from the base of the germen, thread-shaped, rather longer than the corolla; stigma peltate, flat; fruit not ascertained. Essential Character. *Corolla:* funnel-shaped. *Style:* from the base of the germen. *Stigma:* peltate. *Calix:* superior, of five leaves.——The species are,

1. Weigelia Japonica; *Sessile-leaved Weigelia.* Leaves sessile, ovate-lanceolate; they are opposite, pointed, copiously serrated, rather more than an inch in length, veiny, smooth on both sides, except the veins, which are hairy, paler beneath; flower-stalks axillary, compressed, three-flowered, longer than the leaves, with two awl-shaped bractes at the base of each partial stalk, and two more half way up; flowers about an inch long, and of a reddish purple colour. The stem is shrubby, with opposite branches, slightly quadrangular when young, but afterwards round and smooth.—Native of Japan.

2. Weigelia Coræensis; *Large-flowered Weigelia.* Leaves opposite, stalked, obovate. It is a trailing or climbing shrub, with round branches; flower-stalks axillary and terminal, three-flowered, an inch and half long, with awl-shaped bractes;

tube of the corolla slender, above half an inch long, twice the length of the calix; border bell-shaped, twice the length of its tube, divided half way down into five broad, obtuse, horizontally spreading segments; stamina projecting beyond the mouth; antheræ incumbent; stigma large, peltate, flat. Kæmpfer describes it as a shrub, with beautiful flowers, smelling like cloves, snow-white, flesh-coloured, and red, on the same plant.—Native of Corea.

Weinmannia; a genus of the class Octandria, order Digynia.—Generic Character. *Calix:* perianth inferior, of four ovate, spreading, permanent leaves. *Corolla:* petals four, equal, undivided, larger than the calix; nectary glandular, surrounding the base of the germen. *Stamina:* filamenta eight, erect, thread-shaped, longer than the petals; antheræ roundish, of two cells. *Pistil:* germen superior, ovate, acute; styles two, somewhat spreading, the length of the stamina, permanent; stigmas obtuse. *Pericarp:* capsule elliptic-oblong, with two points, two cells, and two valves, whose inflexed margins form the double partitions. *Seeds:* about eight in each cell, roundish. Essential Character. *Calix:* of four leaves. *Petals:* four. *Capsule:* superior, with two beaks, two cells, and two valves with inflexed margins. *Seeds:* several.——The species are,

* *Leaves compound.*

1. Weinmannia Glabra; *Smooth Pinnate Weinmannia.* Leaves pinnate; leaflets obovate, crenate, smooth on both sides; capsule roundish-elliptical, bluntish, about half the size of hemp-seed, brown. The stem is usually shrubby, sometimes becoming a tree forty feet high, with round rugged branches; when young, angular and coarsely downy; the leaves consist of six pairs, more or less, with an odd one, of obovate abrupt leaflets, half an inch in length, all nearly equal, furnished with one rib, and several transverse veins, entire, and wedge-shaped towards the base; flowers very small, white, on fasciculated, short, thick, hairy, partial stalks.—Native of the West Indies.

2. Weinmannia Tinctoria; *Red-tan Weinmannia.* Leaves pinnate; leaflets elliptical, crenate, smooth on both sides; capsule ovate-lanceolate, taper-pointed; seeds hairy. The clusters of ripe capsules are cylindrical, dense, four or five inches in length. The leaves are full twice the size; the clusters of flowers much more lax, less hairy; and the flowers twice as large; as in the preceding.—Found in the isle of Bourbon, where the French call it Tan-rouge, because the bark is used to dye leather of a red colour. Its flowers are supposed to furnish the bees with most of their honey.

3. Weinmannia Hirta; *Hairy-leaved Weinmannia,* or *Bastard Brasiletto.* Leaves pinnate; leaflets elliptic-ovate, crenate, hairy at the back. It is either a shrub or a handsome tree, from forty to fifty feet high, crowned at the very top of its smooth trunk with lax, hairy, or rather downy rusty-coloured branches. The leaves resemble those of the preceding species in shape, but are clothed beneath, sometimes on both sides, with coarse scattered prominent hairs. The leafy borders of each joint of the common footstalk are narrower, and less angular, than those of the first and second species, and their midrib is very hairy beneath; clusters also very hairy, an inch or two in length, in pairs at the summits of the branches; flowers the size of the last, white: capsules oblong; according to Swartz, small, oblong, rather pointed, with several small roundish seeds. The flowers appear in September and October.—Native of lofty mountains in the southern parts of Jamaica.

4. Weinmannia Trichosperma; *Hairy-seeded Weinmannia.* Leaves pinnate; leaflets elliptic-oblong, serrated, smooth on both sides; capsule roundish-elliptical, not obtuse; seeds densely hairy, roundish-kidney-shaped.—Found at San Carlos in Chili.

5. Weinmannia Tomentosa; *Woolly Weinmannia.* Leaves pinnate; leaflets elliptical, revolute, entire, woolly beneath The leaves are hardly an inch and half long; the leaflets about five pairs, with an odd one, each one-third of an inch in length, convex. The joints of the common footstalk are rather shorter than the leaflets, obovate, and their under side woolly; stipules large, ovate, reflexed, coloured, hairy externally, deciduous; flowers in very dense clusters, more than an inch long, on thick, short, woolly, axillary stalks; calix hairy. This is a very distinct and singular species: the branches are woody, round, densely leafy, somewhat warty, of a dark brown.—Native of New Granada.

6. Weinmannia Trifoliata; *Three-leaved Weinmannia.* Leaves ternate; leaflets obovate, crenate, smooth, equal, about an inch long, being about two-thirds the length of their common footstalk, which is simple and naked; clusters cylindrical, dense, two or three inches long, on axillary stalks about half their own length.—Found at the Cape.

** *Leaves simple.*

7. Weinmannia Racemosa; *Smooth-clustered Simple-leaved Weinmannia.* Leaves simple, stalked, ovate, with tooth-like serratures; clusters axillary, solitary, nearly smooth, about the tops of the branches, stalked, longer than the leaves, cylindrical, continuous; their general and partial stalks either slightly downy or quite smooth; capsules obovate, pointed, somewhat downy. The branches are strong, woody, repeatedly branched in an opposite manner, round and rough; footstalks stout, smooth, half an inch long, articulated at the summit with the leaf, which is two or two-and-a-half inches long, and one broad, pointed, coriaceous, quite smooth, strongly veined, beset with blunt, inflexed, wavy teeth or serratures, paler beneath.—Found in New Zealand.

8. Weinmannia Parviflora; *Small-flowered Weinmannia.* Leaves simple, nearly sessile, ovate, pointed, with tooth-like serratures, on short stalks, oblong, smooth on both sides; clusters terminal, aggregate, hairy, from three to six at the top of each branch; flowers only one-fourth the size of the preceding.—Native of Otaheite.

9. Weinmannia Ovata; *Ovate-crenate Weinmannia.* Leaves simple, elliptical, crenate, acute at each end, on short stalks; clusters axillary, solitary, opposite, somewhat downy; at the tops of the branches, each two or three inches long. This tree is eighteen feet high, with furrowed knotty branches, thickened at the insertion of the leaves.—Native of Peru, found near the town of St. Buenaventura, flowering in June and July.

10. Weinmannia Paniculata; *Panicled Weinmannia.* Leaves simple, elliptic-lanceolate, sharply serrated; they resemble the Sweet-Chestnut leaf, are smooth, and stand out on downy footstalks: panicles axillary, compound. The panicled inflorescence is singular among all the known species. Flowers yellowish red; capsules elliptical, acute, downy, beaked, with the straight styles, which are as long as the valves; seeds obovate, smooth, on slender stalks, pendulous.—This small tree is found on the sea-shore, near Talcahuano in Chili.

Weld. See *Reseda.*

Wells.—The importance of Wells in rural economy, is too great to be overlooked. It would be well, before the sinking of Wells is undertaken, to inquire into, and consider minutely the nature and situation of, the springs in the neighbourhood; without which, much fruitless expense and loss of labour are often sustained. All Wells, except those in the

solid rock, require lining with stone or brick, that they may preserve their figure. There are two methods of performing this, which is called the steining. In one a frame of timber, of the same diameter as the Well, is constructed, the lower edge being made sharp, and shod with iron, so that it has a tendency to cut into the ground. This kirb, as it is called, is placed flat upon the ground, and the bricks are built upon it to a considerable height, like a circular wall: the Well-digger enters this circle, and digs away the earth at the bottom, while the weight of the wall forces the kirb and the brick-work, with which it is loaded, to descend as fast as the earth is removed; and more bricks are added at top as fast as it sinks down: but when it gets very deep, it will sink no longer, particularly in passing through a soft strata: in which case a second kirb, of the same kind, but of a smaller diameter, is introduced within the first. When a kirb will not sink, owing to the softness of the strata, or when it is required to stop out water, the bricks or stones must be laid one by one at the bottom of the work, taking care that the work is not left unsupported in such a manner as to let the bricks fall in; this is called underpruning. After Wells are walled round from the bottom to the top, it is usual to have pumps fixed in them; the diameter of the Well is also generally proportioned to the strength of the spring.—As Wells are supplied by springs, which are formed in the bowels of the earth, by water percolating through the upper strata, and descending downwards till it meets with a stratum of clay, or other impervious material which intercepts its course; hence the sinking of Wells is intimately connected with the nature of the strata, and of the spring which each strata may contain. In cases where different kinds of sandy strata rest upon beds of clay at a considerable depth, and have a free issue at the lowest ends of them, if Wells were sunk into the sand beds higher up, no water could be found permanently, until the strata of sand was penetrated quite through, and even some depth into the beds of clay beneath. In such cases the water could never rise in the Wells much higher than a certain point; because when it rose as high as the porous sand, it would flow along through it until it made its escape below; and if the beds of clay should extend backwards under the ground a great way, and at a great depth below the surface, so as to form an abundant and never-ceasing stream under the beds of sand, it will necessarily follow that the Wells will continue exactly at the same height, as in the case of a strong bason at a fountain, into which a pipe of water constantly flows, so as to keep it running over. When, however, the streams below the beds of sand are small, and the draught of water from the Wells at times uncommonly large, the surface of the water in the Wells will of course be made to sink; and, as we often see, be even entirely drained, so as to require time to fill again. This evil, however, might be averted by enlarging the reservoir, either by widening the Wells, or sinking them to a greater depth in the clay, or by both those expedients. When quicksand comes in the way of Well-diggers, it presents obstacles which can only be removed with great labour and difficulty. Probably the best remedy is to find or form an outlet, by which the water may be entirely discharged. This, when the quicksand lies above the level of the sea, or the adjoining lands, may often be cheaply accomplished by paying proper attention to the position and natural dip of the strata, which may be discovered by various means besides boring. But there are cases particularly, where the quicksand is produced by a cavity like a bason, scooped out of the entire bottom, so as to contain water to a considerable depth, which in some particular situations may be reckoned irremediable. In springs of this kind, the quantity of water flowing over the lower surface of the clay, will not seem to be diminished by digging Wells in a higher position; for as the Well, as soon as it is filled, must overflow, that will not intercept one drop more water than what is drawn out of it: were it even possible to pump the water out as fast as it enters the Well, that would not much alter the case, because no more water could be thus intercepted than that which would have flowed into the mouth of the Well in its descent: hence every drop, passing the Well mouth on either side, would flow forward to the lower situation. If the bed of sand be of great extent, supported by a bed of clay, or other impervious matter, there water will undoubtedly be found, whatever may be the depth of the bed of sand above it, if a Well be dug through it; for as the water, that falls in showers upon the earth's surface, necessarily sinks through that pervious stratum, it soon escapes beyond the sun's power of evaporation, and sinks downwards till it meets with an impervious stratum. There are many other cases of strata and springs, as concerned in the opening and forming of Wells, that constitute different classes of springs for this use, as those where the water is confined and pent up in retentive beds, so as to be applicable to the supply of Wells, by simple boring down into them, or making slight openings in other ways, by which the water may flow up.—The most ingenious method of forming Wells is that proposed by a French philosopher, who has advised to perforate the ground to a sufficient depth with an auger or borer; a cylindrical wooden pipe then to be placed in the hole, and driven downward with a mallet, and the boring continued, that the pipe may be forced down to a greater depth, so as to reach the water or spring. In proportion as the borer becomes filled with earth, it should be drawn up and cleared, when, by adding fresh portions of pipe, the water may generally be reached and obtained. Wells made in this manner are superior to those constructed in the common method, not only in point of cheapness, but procuring a more certain and abundant supply of water, without at all endangering the workmen employed. When the water near the surface does not appear to be good, the perforation may be continued to a much greater depth, till a purer fluid can be procured: and wherever Wells have been injured or tainted, they can be emptied and deepened by the borer, so as to reach the lower sheet of water. The greatest obstacle to the general practice of this ingenious and safe method of forming Wells, is the expense of the borer, which, when carried to any great depth, would require an apparatus to work it by means of horse-power. Other utensils would also be necessary, in order to work through hard strata of different kinds; and in some instances no doubt it would wholly fail to penetrate hard substances. There would also be much difficulty in driving down the wooden pipes in many cases, especially to any considerable depth; as well as in fitting the wooden pipes with sufficient exactness to fit the aperture formed by the boring auger. The best mode would probably be, to have metallic pipes cast for the purpose, and so formed as to fit exactly upon each other, to any depth that might be necessary in sinking Wells.—Well-diggers are sometimes exposed to suffocation by the noxious air; which is usually removed by means of a large pair of bellows, and a long leathern pipe, which is hung down to the bottom of the Well, and fresh air is forced down it by means of the bellows. This, however, is a tedious and uncertain process. Some throw water down, which often has the desired effect, but the cost is that of having to draw it up again, which is very laborious. See *Land*, *Water*, and *Weather*.

Welt Root.—A term signifying the dying away or falling off of wheat crops, in some instances, during the winter or early spring seasons. It has been supposed to infest the corn most frequently where the Wheat crops have been put in on Clover leys. Some incline to think, that it depends upon the want of a sufficient degree of closeness and firmness in the soils on the beds of mould, into which the crops have been put; as, where they lie too open and in too porous a state, proper nourishment is not supplied to the young Wheat plants from below, so that of course they do not form their roots in a proper manner.

Wendia; a genus of the class Pentandria, order Digynia. —Generic Character. *Calix:* general involucrum none; partial of a few short, unequal, lanceolate or linear, deciduous leaves. *Perianth:* of five unequal teeth, two of them, in the radiant florets, twice as large as the rest, ovate, acute. *Corolla:* universal irregular; flowers of the radius perfect, fertile, except a few males which are interspersed; partial of five petals, with long claws; the outer ones in the radius very large, the middle one divided almost half way down into two divaricated, linear-oblong, obtuse, slightly falcate, equal lobes; lateral ones rather smaller, unequally cloven, falcate, one lobe three or four times the length of the other; inner ones much the smallest, about equal to the petals of the disk, two-lobed from their incurvation: their point ovate-lanceolate, acute, channelled. *Stamina:* filamenta five, simple, equal, spreading, the length of the smaller petals, longer than the petals in the flowers of the disk; antheræ nearly ovate, two-lobed. *Pistil:* germen oval, compressed, striated, hairy; styles two, erect, at length widely spreading, tapering, their base conical, winged with a membranous crisped border, running down from each style; stigmas capitate, obtuse, at length somewhat globular. *Pericarp:* fruit almost perfectly smooth, obovate, nearly orbicular, compressed, bordered, striated and striped, entire at the edges. *Seeds:* two, uniform, emarginate, crowned, in the terminal notch, with the conical, winged, sessile base of the two deflexed permanent styles; dorsal ribs three, slender, slightly elevated, converging at each end; marginal ones two, parallel; stripes four, descending from the top of the seed between the ribs, obtuse, club-shaped, brownish, not half the length of the seed; border convex, terminating in a thin, flat, sharp edge, which is channelled externally, emarginate at the bottom. *Observe.* The want of a general involucrum, and the slightness of the partial one, added to the more orbicular form of the seeds, and their smoothness, appear to afford the chief marks of distinction between this genus and *Heracleum.* Essential Character. *General Involucrum:* none; partial obsolete. *Flowers:* radiant. *Calix:* unequally toothed. *Fruit:* nearly orbicular, compressed, notched, with three ribs, and four short intermediate stripes; crowned with the styles, the base of which is winged.——The only species known is,

1. Wendia Chorodanum; *Long-leaved Wendia.* Root biennial; leaflets two pair, with an odd one; general and particular involucrum scarcely discernible; flowers snow-white, those of the radius remarkably unequal; seeds, when bruised, agreeably fragrant.—It flowers in July, and is a native of the grassy declivities surrounding the Caucasian mineral waters of Nartsana.

Wendlandia; a genus of the class Hexandria, order Hexagynia. Essential Character. *Calix:* of six leaves. *Petals:* six, succulent. *Styles:* reclining. *Capsules:* six, of one cell. *Seeds:* solitary.——The only known species is,

1. Wenlandia Populifolia; *Poplar-leaved Wendlandia.* Stem twining, with round branches, striated and downy when young; leaves alternate, heart-shaped, or broadly-ovate, entire, tipped with a small point, rarely three-lobed, an inch and half or two inches long, with three or five radiating ribs, downy beneath; footstalks round, downy, about an inch in length; flower-stalks axillary; those of the male flowers, which are generally distinct from the female, racemose, simple; those of the female three-cleft; flowers very small, greenish-white; berries red.—Found in hedges and woods, from Carolina to Florida; flowering in June and July. It is a hardy plant, and flowers in European gardens in August.

Westringia; a genus of the class Didynamia, order Gymnospermia.—Generic Character. *Calix:* perianth inferior, of one leaf, tubular, somewhat bell-shaped, with five sides, and five prominent angles, but no furrows, divided about half way down into five equal, erect, lanceolate, beardless, permanent segments. *Corolla:* of one petal, ringent, twice as long as the calix; tube the length of the calix, hairy in the throat; border two-lipped; the upper lip flat, erect, divided, rather the longest; lower in three, oblong, equal, spreading, entire segments. *Stamina:* filamenta four, shorter than the border, divaricated, the two upper ones longest; antheræ of the two upper stamina roundish, halved, those of the two lower divided, imperfect. *Pistil:* germen in the bottom of the calix, four-lobed; style thread-shaped, the length of the longer stamina; stigma small, cloven, acute. *Pericarp:* none, except the hardened calix. *Seeds:* four, obovate, naked. Essential Character. *Calix:* five-cleft half way down, five-sided. Upper lip of the *Corolla:* flat, cloven; lower in three deep equal segments. *Stamina:* distant, the two upper with halved antheræ; two lower with divided abortive ones.——The species are,

1. Westringia Rosmariniformis; *Rosemary-leaved Westringia.* Leaves four in a whorl, lanceolate, revolute, shining, and nearly smooth above, silky beneath; calix silky, its teeth longer than the tube. The stem is shrubby, several feet high, very much branched; branches either opposite or four together, square, silky with white close hairs, densely leafy; the leaves are spreading, an inch or rather less in length, acute, single-ribbed, entire, dark green, and polished above, underneath white with silky hairs; footstalks broad, and very short, silky, without stipules; flowers about the upper part of the branches shorter than the leaves; their corolla spreading nearly an inch, white, dotted about the mouth with violet spots; antheræ violet. The plant is slightly bitter, but not aromatic.—Native of New South Wales, near Port Jackson.

2. Westringia Dampieri; *Dampier's Westringia.* Leaves four in a whorl, linear, strongly revolute, nearly smooth above, hoary and opaque beneath; calix hoary and opaque, its teeth half the length of the tube.—It flowers from May to July in our green-houses, and was found on the southern coast of New Holland.

3. Westringia Rigida; *Rigid Westringia.* Leaves three in a whorl, linear-lanceolate, divaricated, sharp-pointed, revolute, smoothish above, hoary beneath; calix hoary, its teeth half the length of the tube.—Native of New Holland.

4. Westringia Cinerea; *Gray Westringia.* Leaves three in a whorl, linear, spreading, pointed, revolute, hoary on both sides; calix hoary, its teeth scarcely a quarter the length of the tube.—Found in the southern parts of New Holland.

5. Westringia Angustifolia; *Narrow-leaved Westringia.* Leaves three in a whorl, linear, spreading, revolute, roughish on the upper side, hoary beneath; calix hoary, its teeth half the length of the tube.—Found in Van Diemen's Land.

6. Westringia Longifolia; *Long-leaved Westringia.* Leaves three in a whorl, linear, revolute, rough, with minute points on the upper side, slightly hairy beneath; calix rather hairy,

its teeth equal to the tube. The corolla is externally downy. —Found near Port Jackson in New South Wales.

7. Westringia Glabra; *Smooth Westringia.* Leaves three in a whorl, linear-lanceolate, flat, smooth on both sides, as well as the calix.—Native of New Holland.

8. Westringia Rubiæfolia; *Madder-leaved Westringia.* Leaves four in a whorl, elliptic-lanceolate, nearly flat, very smooth and shining; calix nearly smooth.—Found in Van Diemen's Land.

Wheat. See *Triticum.*

Wheat, Cow. See *Melampyrum.*

Wheat, Indian. See *Zea.*

Whelera; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in five deep, roundish, erect, permanent segments, shorter than the corolla. *Corolla:* of one petal, bell-shaped, spreading, in five deep, ovate, acute segments. Nectary somewhat pitcher-shaped, in the bottom of the flower. *Stamina:* filamenta five, awl-shaped, rather longer than the corolla; antheræ roundish. There are five other filamenta, alternate with the former, and similar to them, but shorter, and destitute of antheræ. *Pistil:* germen superior, conical, villous; style thread-shaped, twice the length of the corolla; stigma simple. *Pericarp:* drupe roundish. *Seed:* nut large, ovate, of one, two, or three cells.—This is all that has been accurately ascertained concerning this genus.

Whin. See *Ulex.*

Whin, Petty. See *Genista* and *Ononis.*

White Beam Tree. See *Cratægus.*

White Hellebore. See *Veratrum.*

White Horehound. See *Marrubium.*

White Leaf Tree. See *Cratægus.*

White Thorn. See *Cratægus Oxycantha.*

Whitlow Grass. See *Draba* and *Saxifraga.*

Whortle Berry. See *Vaccinium.*

Widow Wail. See *Cneorum.*

Wild Basil. See *Chinopodium.*

Wild Bugloss. See *Lycopsis.*

Wild Cumin. See *Lagœcia.*

Wild Germander. See *Veronica.*

Wild Liquorice. See *Abrus.*

Wild Plantain. See *Heliconia.*

Wild Rocket. See *Brassica Muralis.*

Wild Rosemary. See *Andromeda Pilifolia.*

Wild Service. See *Cratægus Terminalis.*

Wild Tansy. See *Potentilla Anserina.*

Wilderness, The—in a garden should always be proportioned to its size, and ought never to be situated too near the house, because the trees exhale so large a quantity of watery vapours, as make the air very unwholesome: though it has been ascertained, that, on the whole, vegetables serve to purify the atmosphere. The wilderness should never be placed so as to intercept a good prospect; but where the view naturally ends with the verge of the garden, or little more, nothing terminates it so well as a fine plantation of trees. The size of the trees should be considered, and tall-growing ones should be planted in larger places; smaller, in less extensive; evergreens also should be kept by themselves, and placed most in sight, not mingled confusedly among the trees, which cast their leaves. The walks should be large, and not numerous; the largest serpentine, and this should not be entered upon in the grand walks of the garden, but by some private walk. It is too common a method to dispose the trees in wildernesses, in form of regular squares, triangles, &c. but this is faulty; for as nature should be studied in these works of fancy, the most irregular, where the irregularity does not appear designed, is the most natural. On the same account, walks (see *Walks*) are much more pleasing when they run in wild meanders, than when they intersect one another in studied and regular angles. The winding walks should be made to lead to an open circular piece of grass, with a statue and obelisk, or a fountain; or if an opening large enough for a banqueting-house be contrived in the middle, it will afford a very pleasing scene. The trees should gradually rise from the sides of the walks and openings, one above another, to the middle of the quarters, where the largest trees should stand, by which arrangement the heads of all the trees will be displayed, while their stems remain concealed; for the nakedness of the trees is to be hid, as much as their growth promoted. The larger-growing trees should be planted at a proportionable distance from each other, and the interstices filled up, to conceal their stems, with Roses, Spiræas, and other low-flowering shrubs, which may also be planted near all the walks and openings; and at the foot of these, near the walks, may be set rows of Primroses, Violets, and Daffodils, with other the like flowers; behind the first rank of lower-flowering shrubs should be planted those of a somewhat higher stature, as the Cytisuses and Guelder Roses, and behind these, rows of Lilacs and Laburnums; behind which again the heads only of the lower-growing trees will appear, which should be backed gradually with those of higher growth to the centre of the quarter, from whence the heads of the trees should descend every way to the walks or openings. The grand walks and openings should always be laid with turf, and kept well mowed; but, besides these, there ought to be smaller serpentine walks through the several quarters, where the earth is left bare, and only weeded, for the purpose of privately walking. These walks should be made as winding as possible, and have a few wood-flowers planted along their sides, which will have a very good effect. The evergreens should be allotted a peculiar part of the wilderness, and such as fronts the house; and in the planting of these, the same especial regard should be paid to the rules above laid down. The first row may be Laurustines, Boxes, Spurge, Laurels, Junipers, and Savins: the second Laurels, Hollies, and Arbutuses: the third, Yews, Alaternuses, Phillyreas, Cypresses, and Virginian Cedars: the fourth, Norway and Silver Firs, and the True Pine; and to crown all, the Scotch Pine and Pinaster. These will present a very beautiful appearance when thus arranged, as they will form an artful admixture of the several shades of green, in the most pleasing gradations. See *Plantations.*

Willdenovia; a genus of the class Diœcia, order Triandria. —Generic Character. *Male. Calix:* perianth inferior, of numerous, imbricated, membranous, pointed, permanent glumes, longer than the fruit. *Corolla:* petals six, equal, erect, oval, membranous, permanent. *Stamina:* filamenta three, capillary, shorter than the corrolla; antheræ ovate, oblong. *Female: Calix* and *Corolla:* as in the male. *Pistil:* germen superior, roundish; style very short, two or three clefts; stigmas two or three, downy. *Pericarp:* drupe dry roundish, smooth. *Seed:* nut solitary, of one cell. Essential Character. *Male. Calix:* of many imbricated glumes. *Corolla:* of six petals, permanent. *Female. Calix* and *Corolla:* as in the male. *Style:* one. *Stigmas:* two or three. *Drupe:* with one seed.——The species are,

1. Willdenovia Striata; *Striated Willdenovia.* Stem leafless, round, striated, two feet high or more, erect, rushy, hard, and rather shrubby, branched, usually simply forked, rarely three-forked, round, jointed, striated, smooth; the branches also round and striated; sheaths at each joint and subdivision solitary, ovate, close, brown, smooth; flowers

terminal, solitary, erect, the size of a pea; scales of the calix about ten, rarely fewer, or more, loosely imbricated, equal, oblong, pointed, brown, smooth, the length of the nail, membranous at the edges; corolla white, much shorter than the drupe, and pressed close to its sides; style in two short, broad, yellow divisions; stigmas short, obtuse, brown; drupe ovate, black, dotted.—Native of the Cape of Good Hope.

2. Willdenovia Teres; *Smooth Willdenovia.* Stem and branches leafless, round, smooth and even. The former is shrubby, much branched, and jointed, simply or triply forked, erect, a foot or more in height, not striated; the branches are somewhat level-topped. Sheaths at each subdivision ovate, brown, smooth, as long as the nail. Flowers terminal, solitary, erect; scales of the calix about six, ovate, awned, gray and smooth; petals very short, emarginate, shining, surrounding the base of the fruit; style undivided, very short; stigmas feathery, tapering, purplish; drupe hard, ovate, black, smooth, of one cell. It differs from the preceding, in having fewer calix-scales, a smooth and more branched stem, and a smooth undotted fruit.—Native of the Cape.

3. Willdenovia Compressa; *Compressed Willdenovia.* Stem leafy, smooth and even; branches compressed. The former is two feet high, or more, shrubby, erect, smooth in every respect, simply or triply forked; the latter are compressed or semicylindrical, wand-like: sheaths of the subdivisions ovate, pointed; leaves on the young branches, and resembling them, thread-shaped, tapering; flowers terminal, solitary, upright, the size of a pea; scales of the calix ovate, awned, smooth, membranous at the edges; petals ovate, acute, as long as the fruit.—Native of the Cape.

William, Sweet. See *Dianthus.*

Willichia; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in four ovate, acute, spreading, permanent segments. *Corolla:* of one petal, wheel-shaped, twice the length of the calix; tube scarcely any; border flat, in four roundish convex segments. *Stamina:* filamenta three, inserted into the clefts of the limb, except the lowermost, and shorter than its segments; antheræ erect, roundish, of two cells. *Pistil:* germen superior, roundish, compressed; style thread-shaped, the length of the stamina, declining towards the lower clefts of the corolla; stigma obtuse. *Pericarp:* capsule roundish, compressed, sharp-edged, of two cells and two valves, with an opposite partition. *Seeds:* several, roundish, minute. *Receptacle:* globular, formed of two hemispheres. Essential Character. *Calix:* four-cleft. *Corolla:* four-cleft. *Stamina:* in three of its clefts. *Capsule:* superior, of two cells, with many seeds.——The only species known is,

1. Willichia Repens; *Creeping Willichia.* Root fibrous, annual; stem herbaceous, creeping, thread-shaped, branched, hairy, about two feet in length; leaves alternate, stalked, rather distant, orbicular, somewhat peltate, crenate, hairy, an inch in diameter, reddish underneath; footstalks very long, hairy, thicker than the stem; flower-stalks axillary, in pairs, single-flowered, thread-shaped, hairy, the length of the footstalks; flowers small, rose-coloured, with a hairy calix.—Native of Mexico.

Willow. See *Salix.*

Willow Herb. See *Lythrum.*

Willow, French. See *Epilobium.*

Willughbeia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, fleshy, in five deep acute segments, very small. *Corolla:* of one petal, salver-shaped; tube cylindrical, enlarged at the bottom; border horizontal, in five deep, oblique, acute, wavy segments, more dilated at one side than the other, lying over each other at the base. *Stamina:* filamenta five, very short, inserted into the tube just above the base; antheræ arrow-shaped. *Pistil:* germen superior, roundish; style quadrangular; stigma capitate, ovate, thick, striated, double-pointed, subtended by a flat orbicular disk. *Pericarp:* berry ovate, coated, of one or two cells. *Seeds:* numerous, angular, compressed, imbedded in pulp. Essential Character. *Corolla:* salver-shaped, contorted. *Stigma:* capitate. *Berry:* coated, with many angular seeds.——The species are,

1. Willughbeia Acida; *Acid Willoughbeia.* Stem erect; flowerstalks the length of the footstalks. The trunk is seven or eight feet high, and seven or eight inches in diameter, with a grayish bark, and soft white wood. The head consists of very numerous straight knotty branches, subdivided in an opposite manner; leaves opposite, on short stalks, elliptical, somewhat pointed, entire, wavy, smooth and shining, with one rib, and many transverse parallel veins, their greatest length seven inches by three in breadth; flowers axillary, three or four together on one common footstalk; bractes scaly, solitary at the base of each general, as well as partial stock; corolla whitish; fruit lemon-coloured, oval, corrugated or warty, two inches long, separated by a longitudinal fleshy partition into two cells, filled with acid viscid pulp, and containing many rough brown seeds. The fruit, though milky, is wholesome and agreeably acid, notwithstanding a degree of viscidity by which the pulp adheres to the lips and teeth. After the rind is taken off, the remainder is soaked for a while in water. It is preserved in sugar, either with or without the rind; in the latter mode it is cooling, and slightly acid; in the former, moderately purgative, and useful in dysenteries. The whole plant when wounded discharges a milky very tenacious juice.—Native of forests in Cayenne and Guiana, bearing flowers and fruit in September.

2. Willughbeia Scandens; *Climbing Willoughbeia.* Stem twining; flowerstalks branched, as long as the leaves. The trunk is about three inches in diameter, sending off long knotty trailing branches, which twine round the neighbouring trees to their very summits, from whence the extremities hang down clothed with opposite, oval, smooth, entire leaves, of the same size, and resembling those of the preceding species; they are on short stalks, their rib and lateral veins reddish; flowerstalks axillary, solitary, wavy, alternately branched, resembling tendrils, terminating in several little tufts or umbels of yellow flowers, rather smaller than the first species; fruit roundish or obovate, the size and colour of a quince, of an agreeable scent when ripe, pulpy, yielding but a small quantity of milky juice when cut.—Native of the woods of Guiana, flowering in May.

Wilsonia; a genus of the class Pentandria, order Monogynia. Essential Character. *Calix:* pitcher-shaped, five-sided, five-toothed. *Corolla:* funnel-shaped, of one petal, imbricated in the bud. *Germen:* of two seeds. *Style:* cloven. *Stigmas:* capitate.——The only known species, and that imperfectly described, is,

1. Wilsonia Humilis; *Humble Wilsonia.* Leaves small, sessile, thickish, imbricated in two ranks; flowers axillary, solitary, sessile, without bractes. This is a little, dwarf, shrubby, prostrate, much branched, downy plant.—Found in the south part of New Holland.

Wintera; a genus of the class Polyandria, order Tetragynia.—Generic Character. *Calix:* perianth inferior, of one leaf, splitting into two or three segments. *Corolla:* petals six, or more, ovate, spreading. *Stamina:* filamenta

numerous, shorter than the corolla, dilated upwards; antheræ terminal, of two lateral ovate cells, separate at the base, converging at their points. *Pistil:* germina four to eight, crowded, obovate; styles none; stigmas depressed, flat. *Pericarp:* berries four to eight, ovate, somewhat triangular. *Seeds:* several, disposed in two rows. ESSENTIAL CHARACTER. *Calix:* splitting unequally. *Petals:* numerous. *Stamina:* club-shaped, with terminal two-lobed antheræ. *Styles:* none. *Berries:* superior, aggregate. *Seeds:* several, in a double row.——The species are,

1. Wintera Aromatica; *Officinal Winter's-bark.* Leaves elliptical, obtuse, coriaceous, alternate, crowded at the ends of the branches, evergreen, two or three inches long, and one and a half wide, thick and rigid, entire, somewhat revolute, with a stout midrib, and scarcely visible veins, very smooth on both sides, somewhat glaucous beneath, but not invariably or permanently so; footstalks broad and thick, smooth, half or three quarters of an inch long; stipulas none; flowering-stalks aggregate, at the ends of the branches, simple, or three-cleft, smooth, not half the length of the leaves, accompanied at their base by several ovate, pale, deciduous bractes; flowers smaller than a Hawthorn blossom, white; calix reddish, unequally three-lobed; berries from three to six, each with four triangular seeds. It is a tree of considerable size, often fifty feet high, with twisted knotty branches, and a thick rugged bark, of an aromatic smell, and permanent pungent flavour. The bark is little used at present in medicine.—Native of the country on both sides the straits of Magellan.

2. Wintera Granadensis; *New Granada Winter's-bark.* Leaves elliptic-lanceolate, obtuse, four or five inches long, and nearly one and a half broad, scarcely revolute, perfectly smooth, very glaucous beneath; footstalks smooth, an inch long; flowerstalks axillary, solitary, sometimes nearly the length of the leaves, always half as long, simple, divided, or three-cleft; flowers with about twelve petals, and a deeply three-cleft calix; berries six or eight, obovate, sometimes confluent, each with from four to six seeds; pistilla eight. The bark is aromatic, like the first species. This tree is eighteen or twenty feet high, with round branches, more straight, and less rugged, than in the preceding species.—Native of New Granada, on lofty mountains.

3. Wintera Chilensis; *Chili Winter's-bark.* Leaves oblong, obovate, glaucous beneath, coriaceous, very smooth, tapering at the base, on short stalks; flowerstalks axillary, sometimes very short, bearing an umbel of four or five elongated simple stalks; sometimes four or five simple ones all together, each an inch long at most, single-flowered; calix in two or three ovate blunt divisions, not soon deciduous, and perhaps lasting till the fruit ripens; petals six to nine, oblong, bluntish, twice the length of the calix; pistilla five or six; stamina very short; germina five or six, ovate, crowded on a small globose receptacle; berries oval, rather compressed. This is a tall shrub, with a very aromatic bark, and round branches. —Found in marshy situations in Chili.

4. Wintera Mexicana; *Mexican Winter's bark.* Leaves oblong-lanceolate, pointed at each end; flowerstalks elongated, umbellate, four-flowered; calix divided, permanent, concave; petals twenty to twenty-four, acute, white, spreading, oblong, in a double row; stamina very short. A shrub, with round branches, terminating in a sharp bud.—Native of Mexico.

5. Wintera Axillaris; *Small-flowered Winter's-bark.* Leaves obovate, pointed, reticulated with veins, on stalks rather above half an inch long; they are three or four inches long, and two broad, and are glaucous underneath when young; flowerstalks simple, aggregate, thread-shaped; calix orbicular, lobed, reflexed; petals six, oblong, flat, equal, four times the length of the calix; stamina about sixteen; germina four, turbinate, all perfectly distinct; stigmas dilated, peltate, terminal; berries four, globose, black, with a tawny pulp lodging four ovate, acute, somewhat triangular, gibbous seeds. A tree, with round branches, rough to the touch, but not warty. The flavour of the whole plant, and especially of the bark, is extremely acrid and pungent.—Native of New Zealand.

Winter Aconite. See *Helleborus.*

Winter Berry. See *Prinos.*

Winter Cherry. See *Physalis.*

Winter Cress. See *Erysinum.*

Winter Green. See *Pyrola.*

Witch Hazel. See *Ulmus.*

Witheringia; a genus of the class Tetrandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth inferior, of one leaf, very short, obscurely four-toothed, permanent. *Corolla:* of one petal, wheel-shaped; tube very short, nearly globular; border in four deep, lanceolate, acute, recurved segments; nectary four slightly-bordered cavities, in the tube of the petal. *Stamina:* filamenta four, erect, downy, inserted into the base of the corolla; antheræ converging, ovate, two-lobed, bursting at the sides. *Pistil:* germen superior, ovate; style thread-shaped, rather longer than the stamina; stigma capitate. *Pericarp:* berry roundish, of two cells. *Seeds:* numerous, inserted into the divided receptacle. ESSENTIAL CHARACTER. *Corolla:* deeply four-cleft, reflexed; its tube with four external prominences, internally concave. *Calix:* obscurely four-toothed. *Antheræ:* converging, bursting laterally. *Berry:* with two cells and many seeds.——The only known species is,

1. Witheringia Solanacea; *Yellow-flowered Witheringia.* Root perennial; stem herbaceous, hardly a foot high, round, downy, reddish, rendered slightly angular by the decurrent footstalks; leaves in alternate pairs, stalked, ovate-oblong, acute, wavy, entire, rather downy, four or five inches long; flowers about the size and shape of Solanum Nigrum, except being only four-cleft, pale yellow, drooping, in many-flowered, axillary, sessile umbels, their stalks round, smooth, half an inch or more in length; stamina whitish, internally hairy. The mode of bursting of the antheræ distinguishes this genus from *Solanum.* It flowers in our stoves during most of the year; but having little beauty, is not likely to be much cultivated for ornament.—Native of South America.

Witsenia; a genus of the class Triandria, order Monogynia.—GENERIC CHARACTER. *Calix:* none, unless the upper pair of bractes receive that name. *Corolla:* of one petal, tubular, erect; tube cylindrical, slender at the base, gradually dilated at the top; border spreading, regular, in six deep, equal, obovate segments. *Stamina:* filamenta three, very short, inserted into the mouth of the tube, at the base of three alternate segments of the border; antheræ oblong, erect. *Pistil:* germen superior, roundish, small; style thread-shaped, erect, longer than the tube of the corolla, slightly curved at the extremity; stigma in three short, equal, rather spreading segments. *Pericarp:* capsule membranous, of three cells and three valves. *Seeds:* several, angular. ESSENTIAL CHARACTER. *Calix:* none. *Corolla:* with a cylindrical tube; border in six deep, equal, obtuse segments. *Stigma:* slightly three-cleft. *Capsule:* of three cells, with several angular seeds.——The species are,

1. Witsenia Maura; *Downy-flowered Witsenia.* Flowers terminal, in pairs at the extremities of the short branches,

crowded more or less numerously, into a corymbose tuft; corolla two inches long; tube yellow at the base, dark blue for a considerable extent in the upper part; border yellow, scarcely spreading, full half an inch long, clothed externally with dense shaggy pubescence of a very peculiar kind, confined to the tips of the inner segments. Root perennial, woody; stem shrubby, erect, more or less branched, two feet high, compressed, naked in the lower part, and appearing as if jointed, from the scars of fallen foliage; leafy above.—It flowers in April and May, on the sides of shady hills at the Cape of Good Hope.

2. Witsenia Corymbosa; *Corymbose Witsenia.* Corymb many-flowered; flowers very numerous, bright blue, in a forked, corymbose, compound panicle, supported by a long stalk, at first terminal, but soon becoming lateral; corolla externally smooth; leaves like those of the first species, but only half its size, rather glaucous; stem shrubby, from four to six inches high.—Native of the Cape.

3. Witsenia Ramosa; *Branching Witsenia.* Stem much branched, only a span high, remarkably woody, repeatedly branched in a corymbose manner, naked below; the branches compressed, two-edged, knotted or scarred as if jointed, leafy at their extremities; leaves equitant, two-ranked, linear, narrow, one and a half or two inches long, rather glaucous, reddish at the base; flowers terminal, very few together, if not quite solitary, blue, remarkable for the length and slenderness of their tube, which sometimes measures nearly two inches; corolla externally smooth; its tube capillary, twice the length of the border, which is rather less spreading, and more bell-shaped, than that of the preceding species; bractes membranous, elongated, brownish.—Native of hills at the Cape; flowering in October, November, and December.

4. Witsenia Pumila; *Dwarf Witsenia.* Stems simple, single-flowered; leaves crowded, two-ranked, awl-shaped, compressed, strongly ribbed, about an inch long; flowers whitish, small, solitary, nearly sessile, among the uppermost leaves, which form a kind of sheath, but each appears to have also a bivalve sheath, or pair of permanent bractes; capsule brown, with rather rigid emarginate valves. The root is perennial, long, branched, bearing dense tufts of simple leafy stems, an inch or an inch and half high.—Found at the Straits of Magellan.

Woad. See *Isatis.*

Woad, Wild. See *Reseda.*

Wolf'sbane. See *Aconitum.*

Woodbine. See *Lonicera.*

Woodroof. See *Asperula.*

Wood Sage. See *Teucrium.*

Woods and *Groves*—are the greatest ornaments to a country-seat, without which it must be greatly defective, wood and water being absolutely necessary to render a place agreeable and pleasant. Where there are woods already grown to a large size, so situated as to be taken into the garden or park, or so nearly adjoining as that an easy communication may be made from the garden to the Wood, they may be so contrived, by cutting walks through them, as to render them the most delightful parts of an estate, by procuring an agreeable shade from the scorching heat of the sun in summer. Whoever have grown Woods already near their habitation, lying so that an easy communication may be formed from one to the other, will have little occasion for wildernesses in the garden, because natural Woods may be so contrived as to render them much pleasanter than any new plantation can possibly become for many years, even where the trees make the greatest progress in their growth. In places where their growth is slow, it would take nearly half a century before their shade could equal that of Woods already in perfection. Add to this, the great saving of expense, with other particulars, which are fully detailed under the article *Wilderness.* The culture of Woods, for the profit of the proprietor and the benefit of the nation, is of vast importance. It has been often urged, by persons whose judgment in other affairs might be relied upon, that the great plantations, which, for several years past, have been carried on in several parts of this kingdom, will be of public benefit in the propagation of timber: but in this we fear they will be generally mistaken; shade and shelter, except in a few public-spirited instances, having been more considered than the increase of valuable timber. The two most substantial timbers of this country are the Oak and Chestnut, the latter of which has become very scarce. Next to these, as a profitable wood, comes the Elm, few of which are now cultivated, except the Wich Elm, in the north-west part of England: see *Timber.* Wherever there are young Woods, great attention should be paid to the fences; for if cattle get in among the trees while young, they will soon do infinite damage by browsing on the branches, or barking them. Hares and rabbits are also very destructive in frosty weather, and when the ground is covered with snow, gnawing the bark and branches, and soon inflicting irreparable injury. Another care to be taken of young Woods, is the thinning of the trees as they advance in their growth. This should be very cautiously and gradually performed, so as not to open the trees too much, to let in the cold winds among them, which would greatly obstruct their growth; nor ought they to be left so close as to draw each other up like Maypoles, but a medium should be observed, cutting down a few each year, as there may be necessity, not suffering those to stand which injure the growth of the neighbouring trees, and always allowing the most promising to remain. The young trees should not be lopped or pruned, for the more they are cut, the slower will their increase in bulk be; every branch that is cut off will rob the tree of its nourishment, in proportion to the size of the branch; hence the hatchet should never be used by any but skilful persons. Where more regard is had to the future produce of the timber than to immediate profit, the under-wood should be grubbed up as the trees advance, that the roots may have the whole benefit of the soil, and their stems enjoy the free air; otherwise they will generally be covered with moss, and their growth greatly stinted. This may be observed in all Woods where there is any quantity of under-wood remaining; in such places the trees seldom grow to a large size: but where timber is expected, the trees must have room to extend their roots and branches, though, from covetousness, many let their under-wood remain as long as it will live. Hence, as the timber gradually increases, the under-wood will be gradually decaying in the shade and drip of the large trees; by which practice the timber suffers more in a few years than all the under-wood is worth; for, by endeavouring to obtain both, neither of them can be so good as when they are separately preserved. If proprietors of estates would be careful to nurse up trees in their hedge-rows, it would, in time, become a fortune to their successors; as the timber growing in the hedges might be worth more than the freehold of the estate, which has in fact been the case with estates, from which their possessors have cut down timber for fortunes to their younger children; besides, as the trouble and expense are not great, and the profit is certain, it is foolish to neglect such an advantage, especially where the sight of trees, of our own sowing, making yearly advances, must be very grateful to those who have any relish for rural amusement. There are some persons who plant copses for cutting every ten or

twelve years, according to their growth. This is usually done in autumn, either with stools or young plants drawn out of the woods; but the latter are to be preferred. These copses are most profitable when they consist of Ash and Chestnut; because where they thrive, the poles are valuable; they also furnish good hoops, and both find a ready sale. Where the copses are intended to remain, there should be no standard trees left for timber, because, as the heads of the trees spread and overtop the under-wood, it will cause that to decay, and where the standards are left upon the stumps of the copse-wood, they will never grow to a large size, nor will the timber be so valuable as that produced immediately from a young root. When, however, copses are planted upon lands free from trees, it will be the better method to sow the trees, especially if Chestnut, Oak, or Beech, be intended; for though the prevailing notion is that planting saves time, yet if the seedlings be kept clear from weeds they will in eight or ten years outgrow those which are planted, and will continue much longer in vigour: the expense also is trifling, compared with that of planting. When a large tract of land is designed for Wood, especially if it be of an indifferent quality, it should be managed as follows: Plough it in October and November, and plough and harrow that the turf may be effectually destroyed; sow it with Turnip-seed, about the third week in June; hoe the crop well, and let it be fed off with sheep, if possible. If another crop of Turnips be taken in the following year, the land will then be in excellent condition for receiving the seeds of forest trees. Some sow them with Oats, and others with a crop of Spring-rye, with the acorns; but it is absolutely certain that trees thus raised from seed, particularly where they are kept well weeded, properly thinned, and very sparingly pruned, will afford better timber, and come sooner to maturity, than when they are drawn from a nursery. As much depends on keeping the seedlings clean, drill-sowing is greatly preferable to broadcast, because they may thus be horse-hoed at a small expense. The usual time of felling is from November to February. See *Planting*.

Woodsia; a genus of the class Cryptogamia, order Filices. —Generic Character. *Fructifications:* in roundish groups, on the back of the leaf. *Involucrum:* cup-like, open, small, nearly flat, jagged, fringed with awl-shaped, incurved, jointed hairs. *Capsules:* several, obovate, on short stalks, crowded in the centre of the involucrum, each bound by a vertical, jointed, elastic ring, and bursting irregularly at one side. *Seeds:* numerous, kidney-shaped, granulated, extremely minute. Essential Character. Groups of *Capsules* scattered, roundish, each seated on a capillary-fringed involucrum.——The species are,

1. Woodsia Ilvensis; *Long-leaved Woodsia.* Frond pinnate; leaflets lanceolate, deeply pinnatifid, with numerous, nearly uniform, oblong lobes. Fronds five or six inches high, erect, in dense tufts; their stalks nearly three inches high, brown, bearing, like the midrib of each principal leaflet, many strap-shaped, taper-pointed, membranous scales. —Found on rocks in the north of Europe, and in all parts of North America.

2. Woodsia Hyperborea; *Round-leaved Woodsia.* Frond pinnate; leaflets heart-shaped, rounded, pinnatifid; lobes rounded, waved, unequal. This is a smaller plant than the preceding species, often not above an inch high, but generally about three inches. The leaflets are shorter and more rounded, as well as their lobes, of a thinner texture, much less deeply pinnatifid, except at their base, where the bottom pair of lobes are often so deeply separated as to form two little leaflets, wavy, or obscurely lobed, and sometimes of unequal size. The main stalk is scaly; leaflets hairy on both sides.—Native of alpine rocks, principally in the north of Europe: sometimes found upon the mountains of Wales and Scotland.

Wood-sorrel. See *Oxalis*.

Woodwardia; a genus of the class Cryptogamia, order Filices. Essential Character. Groups of *Capsules* oblong, distinct, straight, ranged in a simple row, in bordered cavities, parallel to each side of the rib. *Involucrum* superficial, vaulted, separating towards the rib.——The species are,

1. Woodwardia Angustifolia; *Narrow-leaved Woodwardia.* Fronds pinnate; leaflets linear, acute, entire; the barren ones finely serrated. The root is creeping, scaly, and shaggy, bearing several stalked, upright, smooth fronds, of a lanceolate figure, with a long taper point; the barren ones consisting entirely of lanceolate, acute, finely serrated leaflets, decurrent at their base, and somewhat confluent; the fertile of rather fewer, more distant, longer and narrower ones, likewise slightly decurrent and confluent at their base, each leaflet being nearly covered at the back, on each side of the rib, with a close series of turgid nearly cylindrical groups, a quarter of an inch long, of numerous capsules, every group closely covered by its own convex involucrum, and encompassed with a considerably elevated uninterrupted line, bordering the hollow in which it lies. It is perennial, flowers in August, and is about a foot high.—Found in the Cedar and Cypress swamps, from New Jersey to Florida.

2. Woodwardia Japonica; *Blunt-lobed Japanese Woodwardia.* Frond pinnate, two feet or more in height; leaflets sessile, half pinnatifid, with close obtuse serrated lobes, five or six inches long, quite sessile, scaly at the base; lobes above an inch long, and half an inch broad, quite close, and parallel at the sides, paler beneath; groups oblong, three or four in a continued line, close to the rib on each side. The involucrum, reflexed to one side, after the capsules are fallen, leaves the cavity exposed, and like a box with its lid. The capsules appear to be all inserted into that margin of the cavity to which the involucrum or lid is attached. Stalk roughish and somewhat scaly, not smooth.—Found in Japan, fructifying in June.

3. Woodwardia Orientalis; *Sharp-lobed Japanese Woodwardia.* Frond pinnate, more coriaceous than either the second or seventh species, and rather glaucous; leaflets stalked, deeply pinnatifid, with spreading acute serrated lobes, the same size as in the preceding species, but taper at their base into a short stalk; groups slightly lunate outwards, especially the upper and shorter ones, about seven in each row, crowded, and close to the rib.—Found in Japan.

4. Woodwardia Virginica; *Virginian Woodwardia.* Frond pinnate, eighteen inches or more in height, with a pale smooth stalk; leaflets sessile, deeply pinnatifid, with spreading, obtuse, slightly crenate lobes, alternate, above a finger's length, and about an inch or more in width, bright green, and smooth, their numerous segments spreading moderately from each other, forming an acute angle at the base, their margin is somewhat revolute, and very obscurely crenate: rows of fructification accompanying the midribs of the leaflets as well as the ribs of the lobes. The fructification is most abundant on the leaflets of the upper half of the frond, forming lines along their principal rib, at each side as well as along the rib of each segment; the groups finely confluent. The depressions in which the groups are seated, are very slight, though not imperceptible; and the involucrum of each is the narrowest, less vaulted, and soonest turned aside, of any other species. The fructification is perfected in July

and August.—Native of Virginia and Carolina, in swamps and shady woods.

5. Woodwardia Thelypterioides; *Small Woodwardia.* Frond pinnate; leaflets sessile, linear-lanceolate, pinnatifid, villous at the base; segments of the barren ones oblong and bluntish; of the fertile ones shortened, triangular, and acute, all entire; stalk downy, angular. This resembles the preceding species, but is not half so large.—Found in the sandy swamps of South Carolina, near Charlestown.

6. Woodwardia Fimbriata; *Fringed Woodwardia.* Frond pinnate; leaflets sessile, deeply pinnatifid, with spreading rather acute lobes, fringed with sharp teeth. This, which is larger than the fourth species, is distinguished from it by its more acute segments, the margin of which is very conspicuously and copiously fringed with prickly teeth, directed towards the point; groups of capsules, large and turgid, ranged a little obliquely along the ribs of the segments, from three to five pairs on each segment, none at the midrib of the leaflet itself; involucrum strongly and permanently vaulted. —Found on the west coast of North America.

7. Woodwardia Radicans; *Rooting-stalked Woodwardia.* Frond pinnate; leaflets nearly sessile, deeply pinnatifid, with parallel taper-pointed sharply serrated lobes. The fronds are two or three feet high, and a foot and half or nearly two feet in breadth, of a fine green, smooth, beautifully reticulated with veins; each main stalk producing at the back, near the top, a round scaly bud or bulb, the origin of a young plant. The leaflets are generally alternate, often a span long, somewhat pectinate, with a long very slender point; their numerous segments more or less crowded; groups of capsules (none at the midrib of the leaflet,) about seven pairs on each segment, close, direct, scarcely ever at all divaricated, turgid, pale brown, the cavities in which they lie very nearly and conspicuously bordered. This is a hardy greenhouse plant in our climate, and one of the handsomest of the genus.—Native of the deep clayey fissures of rocks in Madeira; and found also in Italy and Portugal.

8. Woodwardia Dispar; *Various-leaved Woodwardia.* Fronds pinnate; leaflets sessile, lanceolate, pointed, pinnatifid, with elliptic-lanceolate, entire lobes; fructification crowded on the much smaller lobes, of a separate narrower frond. The barren fronds approach the last species in size, but their segments are shorter, entire, rather obtuse, and by no means taper-pointed. Those fronds which bear fruit have leaflets similar in shape and lobes to the others, but only one-third the size, bearing a simple row of fructification close to the rib of each segment.—Found in the island of Martinico.

Wood Waxen. See *Genista.*

Woody Nightshade. See *Solanum.*

Worm Grass. See *Spigelia.*

Wormia; a genus of the class Polyandria, order Pentagynia.—Generic Character. *Calix:* perianth inferior, of five roundish, concave, very obtuse, coriaceous, permanent leaves. *Corolla:* petals five, roundish, concave, larger than the calix, tapering at the base, deciduous. *Stamina:* filamenta very numerous, crowded, short, equal; antheræ terminal, linear, longer than the filamenta, shorter than the petals, recurved, bursting by a double orifice at the summit. *Pistil:* germina five or more, superior, distinct, ovate, compressed, crowded; styles terminal, tapering, recurved, longer than the germina; stigmas notched. *Pericarp:* capsules as many as the germina, and of the same form, each of one cell, and one valve, bursting at the inner edge, crowned with one of the permanent styles. *Seeds:* several, from eight to twelve, roundish, each with a pulpy tunic at the base. Essential Character. *Calix:* inferior, of five coriaceous permanent leaves. *Petals:* five. *Antheræ:* with two terminal pores. *Capsules:* five, compressed, distinct, many-seeded. *Styles:* thread-shaped. *Stigmas:* notched.—This genus consists of trees or shrubs, with rather twining stems, and round smooth branches.——The species are,

1. Wormia Madagascariensis; *Madagascar Wormia.* Leaves oval, bluntly sinuated; clusters panicled; footstalks long, channelled above, and marked with transverse wrinkles; flowerstalks nearly opposite to the leaves, erect; partial-stalks single-flowered, without bractes; petals undulated, thrice as long as the calix; seeds roundish; stipules solitary, large, long, leafy, externally villous, deciduous, each leaving an annular scar on the branch. This is an elegant tree, with thick round branches.—Native of Madagascar.

2. Wormia Dentata; *Toothed Wormia.* Leaves ovate, abrupt, coarsely and rather sharply toothed, four inches long, of a broad, elliptic-ovate figure, coriaceous, paler beneath, entire at the base, wavy at the sides, most toothed at the end; transverse ribs very straight; footstalks simple, triangular, smooth; flowerstalks triangular, from three to six flowered; cluster simple, not quite opposite to the uppermost leaf. A tree with round branches.—Native of Ceylon.

3. Wormia Triquetra; *Triangular Wormia.* Leaves ovate, bluntish, bluntly and slightly sinuated, rather tapering at the base; the ribs pinnate, having about eight or ten lateral ribs at each side; footstalks simple, triangular, straight, two inches long; flowerstalks triangular, racemose, simple, nearly opposite to the leaves; two outer calix-leaves rather the largest; petals concave; stamina very short; germina triangular, crowded; styles reflexed. Branches round, brown, and smooth, with an elevated ring round the origin of each leaf.—Native of Ceylon.

4. Wormia Alata; *Wing-stalked Wormia.* Leaves oval, entire, three or four inches long, and above half as broad, smooth, obtuse, with distant transverse ribs, and copious reticulated veins, their under surface rusty-coloured, but polished; footstalks smooth, winged, an inch or an inch and half long; flowerstalk opposite to the upper leaf of the branch, solitary, racemose, triangular, smooth, shorter than the leaves, bearing two or three yellow flowers; petals undulated; antheræ long, linear, with two pores at the end; styles sometimes nine or ten, recurved; capsules coriaceous, gaping, with a number of round seeds, inserted into the margins. Branches round, smooth, except the annular scars left by the stipules.—Native of New Holland.

5. Wormia Sericea; *Silky-stalked Wormia.* Leaves oval, bluntly serrated, crowded about the extremity of each branch, apparently deciduous, being found on young shoots only, shaped like those of the last species, and nearly as large, but somewhat serrated, and while young downy; footstalks depressed, silky as well as the flowerstalks and calix; they are half an inch long, stout, broad, and depressed, blunt-edged, not bordered; stalks simple, single-flowered, silky, about the length of the footstalks, each opposite to a leaf; calix-leaves obovate, concave, an inch long, smooth within, silky at the back; filamenta short; antheræ long, compressed, two-edged, each opening by two terminal orifices; germina crowded together; styles five, recurved at the extremity; stigmas small, abrupt. Branches round, and strongly scarred.—Native of the East Indies.

6. Wormia Retusa; *Abrupt Wormia.* Leaves obovate, abrupt, distantly toothed, smooth; footstalks hairy at the base; stalks single-flowered, smooth; styles five. This tree appears to be nearly related to the second species, but the flowers are solitary and smaller, each on a simple stalk, opposite to the uppermost leaf.—Native of Ceylon.

Worm-seed. See *Artemisia* and *Erysimum*.
Wormwood. See *Artemisia*.
Woundwort. See *Laserpitium*, *Solidago*, and *Stachys*.

Wrightia; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in five small, rounded, bluntish segments, with five or ten internal scales at the outside of the base of the corolla, permanent. *Corolla:* of one petal, salver-shaped; tube cylindrical, various in length; border in five oblong, spreading, oblique segments, as long as the tube, or longer; mouth crowned with ten divided scales, shorter than the limb. *Stamina:* filamenta five, thread-shaped, short, inserted into the throat of the corolla; antheræ arrow-shaped, pointed, prominent, cohering by their middle part to the stigma. *Pistil:* germina two, superior, roundish, cohering; style one, thread-shaped, the length of the tube, dilated at the apex; stigma contracted. *Pericarp:* follicles two, almost cylindrical, either distinct or cohering, pointed, erect. *Seeds:* numerous, inserted into the margins of each follicle, oblong, imbricated downwards, crowned at the lower extremity with silky hairs, directed towards the base of the seed-vessel. Essential Character. *Corolla:* oblique, salver-shaped; mouth crowned with ten divided scales. *Stamina:* prominent. *Follicles:* two, erect. *Seeds:* imbricated downwards, hairy at the lower extremity.—This genus consists of upright shrubs, or small trees.——The species are,

1. Wrightia Antidysenterica; *Oval-leaved Wrightia.* Leaves obovate-oblong, short-pointed, smooth; corymbs mostly terminal; tube of the corolla six times as long as the calix; follicles distinct, a little swelling upwards, their points converging. This is a handsome erect shrub, with numerous branches.—Native of Ceylon.

2. Wrightia Zeylanica; *Lanceolate-leaved Wrightia.* Leaves oblong-lanceolate, blunt-pointed, smooth, smaller than in the preceding species, about an inch and half long; corymbs terminal; flowers like those of the first species, but the tube shorter in proportion, though four times as long as the calix. The branches are long and straight, round, and of a purplish colour.—Native of Ceylon.

3. Wrightia Tinctoria; *Dyer's Wrightia.* Leaves elliptic-lanceolate, or ovate, pointed, smooth; branches and corymbs divaricated; tube of the corolla twice the length of the calix; follicles distinct.—Found in the East Indies.

4. Wrightia Pubescens; *Downy Wrightia.* Leaves elliptic-oblong, pointed, downy as well as the calix; corymbs erect; tube of the corolla scarcely longer than the calix; follicles combined.—Found between the tropics in New Holland, and in Timor.

Wulfenia; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in five deep, linear-awl-shaped, equal, erect, permanent segments. *Corolla:* of one petal, ringent; tube gibbous, and nearly globose at the base; border two-lipped; upper lip shortest, undivided, or slightly notched, vaulted, acute; lower longest, deflexed, three-lobed. *Stamina:* filamenta two, thread-shaped, ascending, shorter than the upper lip; antheræ roundish. *Pistil:* germen superior, ovate-oblong, compressed; style thread-shaped, twice as long as the calix; stigma capitate. *Pericarp:* capsule ovate, compressed, furrowed at each side, of two cells and two divided valves, bursting at the summit. *Seeds:* numerous, roundish. *Observe.* The essential difference between this genus and Veronica, to which it is allied, is in the border of the corolla, which in the latter is wheel-shaped, its lowest segment narrowest: a character of more importance than the proportion of the tube, which in some Veronicas is as long as in this genus. Essential Character. *Corolla:* tubular, ringent; upper lip vaulted, lower three-cleft. *Calix:* in five deep segments. *Capsule:* of two cells, and two cloven valves.——The species are,

1. Wulfenia Bonarota; *Blue Leafy Wulfenia.* The stems are leafy, simple, erect, five or six inches high, downy like the rest of the herbage, each bearing four or five pairs of roundish ovate leaves, about an inch long, with broad and rather shallow serratures; cluster terminal, solitary, ovate-oblong, of several pretty blue flowers, accompanied by lanceolate bractes: calix hairy: upper lip of the corolla entire, decidedly ringent, with a concave upper lip, and the valves of the capsule split at the summit, each into two sharp points. The root is somewhat creeping. Perennial.—Native of the mountains of Italy and Carniola.

2. Wulfenia Ageria; *Yellow Leafy Wulfenia.* Stem leafy; upper lip of the corolla cloven, by which it is distinguished from the first species; leaves ovate-lanceolate, elongated at the point; corolla pale sulphur-coloured, not blue; calix smooth.—Native of Carinthia, and Italy.

3. Wulfenia Carinthiaca; *Carinthian Wulfenia.* Stem naked; root creeping, perennial, half as thick as the middle finger; leaves crenate, several together in a tuft, all radical, obovate, obtuse, four or five inches long, smooth, and shining, except the strong midrib, which is hairy at the back, their base tapering into a winged footstalk; flowers large and handsome, of a fine blue colour, crowded numerously into a dense cluster, supported by an upright, round, firm, though somewhat scaly and slightly hairy, solitary, radical stalk, twice or three times the height of the leaves. After flowering, the cluster becomes three or four inches long, and the permanent calices turn reddish. The capsules are each one-third of an inch in length, brown, abrupt, scarcely exceeding the calix, soon splitting into four parts at the top.—Found on the highest mountains of Carinthia, in a rich soil, among limestone rocks; flowering in July.

Wurmbea; a genus of the class Hexandria, order Trigynia.—Generic Character. *Calix:* none. *Corolla:* of one petal, tubular, permanent; tube with six angles, abrupt at the base; border in six deep lanceolate, acute, equal, erect, or spreading segments, usually about the length of the tube. *Stamina:* filamenta six, thread-shaped, erect, inserted into the mouth of the tube, and shorter than the border; antheræ roundish, of two lobes. *Pistil:* germen superior, triangular, furrowed, smooth; styles three, awl-shaped, triangular, the length of the stamina; stigmas obtuse. *Pericarp:* capsule invested with the withered corolla, oblong, with three angles and three furrows, consisting of three cells, separating from the top half way down. *Seeds:* numerous, round. Essential Character. *Calix:* none. *Corolla:* in six deep equal segments, with an hexagonal tube. *Stamina:* inserted into the mouth of the tube. *Capsule:* superior.——The species are,

1. Wurmbea Pumila; *Dwarf Wurmbea.* Cluster of three or four flowers, rarely more, erect, white, on longish partial stalks, hardly rising above the foliage; the margins of the segments of the flower are purple, and there are spots of the same colour just above the mouth of its tube; tube the length of the border; stamina white. Root a small globular bulb, sunk deep into the earth. The whole herb is only an inch high, with two or three short, sheathing, lanceolate leaves.—Native of the Cape of Good Hope, in sandy ground at the foot of small hills; flowering in August or September.

2. Wurmbea Campanulata; *Bell-flowered Wurmbea.* Tube of the corolla bell-shaped, the length of the limb, which is twice as long as the stamina; stamina white, spreading, not half the length of the limb, with yellow antheræ; spike dense,

cylindrical, terminal, erect, two or three inches long, of numerous sessile, white flowers; bulb ovate; stem solitary, simple, leafy, from three to five inches high, zigzag, tapering, and pale, in the part which is below the surface of the ground; leaves three or four, alternate, widely spreading or recurved, much longer than the stem, but not elevated above it, tapering, channelled, rather glaucous, smooth, their base dilated and sheathing.—Native of the Cape.

3. Wurmbea Purpurea; *Purple Wurmbea.* Tube of the corolla much shorter than the widely spreading border. This resembles the preceding species in its herbage; but the spike is rather more lax, and the flowers all over of a dark violet purple, except the yellow antheræ, having a much shorter tube and longer border.—Native of the Cape.

4. Wurmbea Longiflora; *Long-flowered Wurmbea.* Spike taller than the leaves, three or four inches long, rather lax, many-flowered, with a zigzag angular stalk; tube of the corolla twice the length of the border; flowers entirely white, their tube nearly an inch long; border widely spreading; stamina full half the length of the border. This is a larger and taller plant than the preceding, and its leaves are much broader at the base.—Found upon the sandy hills in various places about the Cape.

Wylia; a genus of the class Pentandria, order Digynia.—Generic Character. *General Involucrum:* of one ovate-lanceolate, membranous, half-clasping leaf, fringed with hairs; partial of five ovate, nearly entire, concave, two or three ribbed leaves, bordered with a pellucid, fringed membrane. *Perianth:* of five minute teeth, permanent. *Corolla:* universal irregular; flowers of the disk perfect, fertile, as well as the female ones, which form the radius; some male flowers are either interspersed in the disk, or disposed in separate umbels; partial of five petals, unequal in the flowers of the radius, the outermost very large, either obovate and flattened, or inversely heart-shaped, with a long claw; equal in those of the disk. *Stamina:* filamenta five, thread-shaped, at first inflexed, and concealed in the hollows of the petals, afterwards prominent; antheræ roundish. *Pistil:* germen ovate-oblong, more or less tapering: styles erect, thread-shaped, nearly equal, standing on a cup-shaped base; stigmas simple. *Pericarp:* fruit linear-oblong, beaked, somewhat compressed, crowned with the erect, permanent styles, and their cup-like slightly notched basis. *Seeds:* two, linear-oblong, hispid, striated; the ribs elevated, continued into the beak with intermediate furrows; valves of the beak parallel to the fruit. *Observe.* The involucral leaves in this genus, though not laciniated, have a notch or two at the end, and precisely agree with those of *Scandix* in texture. Many of the umbels are simple, or occasionally two or three together, resembling a compound umbel. Essential Character. General and partial involucral leaves ovate. *Flowers:* polygamous, radiant. *Calix:* five-toothed. *Fruit:* oblong, somewhat compressed, beaked; valves of the beak parallel to the fruit ——The species are,

1. Wylia Australis; *Southern Wylia.* Umbels simple, or in pairs, of few flowers; they are small and dense, on long stalks; the lower ones opposite to the leaves, solitary; the upper in pairs, or rarely three together, and even then not constituting a really compound umbel: flowers white, moderately radiant; radiant petals obovate, nearly entire; the largest petals sometimes slightly emarginate; fruits from six to ten, perfected in each umbel, their beaks nearly or quite straight, quadrangular, rough with short erect bristles. Root annual; herb slender; stem round, sometimes quite smooth, sometimes more or less hairy; leaves triply pinnate, with linear acute segments, and hairy or rather fringed footstalks.—Native of fields in Italy and the Levant, and in Taura; flowering in May.

2. Wylia Radians; *Radiating Wylia.* Umbels aggregate, from two to five, many-flowered; radiant petals elongated, wavy; beak of the fruit incurved. This is supposed to be equally related to the first and third species; but the flowers are more conspicuously radiant.—Found in Tauria; flowering in May.

3. Wylia Grandiflora; *Large-flowered Wylia.* General umbels of from three to five very hairy rays. Root annual, tapering; stem about a foot high, round, purplish, slightly branched; umbels terminal; the general ones sometimes on short stalks, with a leafy, simple, or divided, linear leaf, in the place of a general involucrum; partial umbels of numerous short smooth rays; their involucrum of several, mostly double-pointed, ovate, white-edged, fringed leaves; flowers remarkably radiant; their largest petals obovate, not always emarginate, each furnished with a long claw; beak of the fruit rather scaly.—Native of Tartary and Georgia.

4. Wylia Iberica; *Georgian Wylia.* General umbels of four or five very smooth rays; radiant petals emarginate, with an inflexed point: the rays of both general and partial umbels appear to be always very smooth; the radiant petals are of a smaller proportion, and essentially distinguished by their sharp inflexed points. Stem somewhat hairy at one side: annual. Very nearly related to the last species in habit and size; and the stem, as in that, sometimes quite smooth.—Native of Georgia.

XANTHE: a genus of the class Diœcia, order Monadelphia.—Generic Character. *Male. Calix:* perianth of one leaf, in five or six small, deep, imbricated, roundish, concave, acute segments, with a pair of minute opposite scales at the base. *Corolla:* petals five, roundish, spreading, larger than the calix. *Stamina:* filamentum one, columnar, erect; antheræ five, two-lobed, forming a peltate concave disk, full of gluten, their under side bursting and discharging the pollen. *Female. Calix:* like that of the male, permanent, inferior. *Corolla:* as in the male. *Stamina:* filamentum none; antheræ five, prismatic, erect, imperfect. *Pistil:* germen superior, roundish, with five furrows; style none; stigmas five, roundish, thick, emarginate, seated on the germen. *Pericarp:* capsule small, globose or oval, with five furrows, five cells, and five valves, bursting at the furrows; their membranous partitions adhering to the central column. *Seeds:* numerous, oblong, imbedded in the pulp, inserted in a double row upon the five-angled columnar receptacle. *Observe.* One-fifth is frequently added to the parts of fructification, in the male as well as female flowers. Essential Character. *Male. Calix:* in five deep segments. *Petals:* five. *Filamentum:* columnar. *Antheræ:* five, two-lobed, forming a peltate disk. *Female. Calix* and *Corolla:* as in the male. *Stigmas:* five, sessile. *Capsule:* of five cells, with many pulpy seeds.——The species are,

1. Xanthe Scandens; *Twining Xanthe.* Leaves obovate, fleshy; opposite, on short stalks, simple, entire, thick, and smooth, three or four inches long, with a thick midrib, and a

short blunt point, but no branching veins; panicles at the ends of the drooping branches, compound, three-forked, smooth; flowers small, yellow; their partial stalks longer than the calix; petals fleshy; capsule globose, about the size of a black currant, fleshy, crowned with the black stigmas all meeting in a point; seeds red. Stem shrubby, with knotty branches, twining round neighbouring trees. Every part of the plant, when wounded, discharges a transparent, white, viscid, resinous juice.—Native of the forests of Guiana. The Indians call it *Quapoy*.

2. Xanthe Parviflora; *Small-flowered Xanthe.* Leaves elliptic-oblong; flowers sessile; capsule elliptical. It differs from the preceding species, in having thinner leaves; smaller flowers, with shorter partial stalks; and an oblong, thicker, yellowish fruit. The bark and leaves, if cut or broken, discharge a yellow glutinous juice, which, when dried, resembles gamboge, and, like it, is soluble in water. Native of the forests of Guiana.

Xanthium; a genus of the class Monœcia, order Pentandria.—Generic Character. *Male Flowers*, compound. *Common Calix:* of many imbricated, slender, equal scales, as long as the numerous florets. *Corolla:* compound uniform, equal, hemispherical, consisting of numerous, tubular, funnel-shaped, monopetalous, upright, five-cleft florets. *Stamina:* filamenta in each floret five, united into a cylinder; antheræ erect, parallel, distinct; common receptacle small, with chaffy scales between the florets. *Female Flowers*, below the male, on the same plant, doubled. *Calix:* involucrum two-flowered, of two opposite acutely three-lobed leaves, their middle lobe longest, beset with hooked prickles, and closely enfolding, as well as united to the germen, except the lobes, which are free. *Corolla:* none. *Pistil:* germen oval, hispid; styles two pairs, capillary; stigmas simple. *Pericarp:* drupe dry, ovate-oblong, cloven at the point, clothed all over with hooked prickles. *Seed:* nut of two cells. *Observe.* Linneus states, that the fruit of this genus could hardly have been well understood, without a previous knowledge of that of Ambrosia: both genera in fact belong to that ambiguous tribe, whose habit, qualities, and, in part, the structure of their male flowers, all associate them with the syngenesious order; while the disunion of their flowers, and the general nature of their female flowers, and fruit, place them in the class Monœcia. Essential Character. *Male. Common Calix:* imbricated. *Florets:* of one petal, funnel-shaped, five-cleft. *Receptacle:* chaffy. *Female. Calix:* two-leaved, two-flowered. *Corolla:* none. *Drupe:* dry, muricated, cloven. *Nut:* of two cells.—All these plants, except the fifth species, are annual. The first will come up from the seeds which fall in autumn, and requires no other care but to thin the plants, and keep them clear from weeds. The second species will thrive in the same way in favourable autumns; but it often happens, in England, that the seeds will not ripen. The fourth species will in some years perfect seeds on self-sown plants; but as they sometimes fail, the sure way is to raise the plants on a gentle hot-bed, and to plant them out on a warm border in a lean soil.——The species are,

1. Xanthium Strumarium; *Common Burrweed*, or *Small Burdock.* Stem thornless; leaves heart-shaped, three-ribbed at the base, alternate, stalked, acutely lobed and serrated, their two lateral ribs marginal for a small space, as in the Great Burdock, and a few other plants: male flowers globular, green, few together, in axillary or terminal clusters, about the upper part of the branches; female, in axillary sessile tufts; fruit elliptical, double-pointed, hard, nearly an inch long, beset with firm, prominent, awl-shaped, hooked prickles, which attach themselves to the coats of animals, and thus serve to disperse the seeds. Root annual; herb branched, rough, dark green, rather fetid, of a coarse rank habit, with furrowed, rather hairy branches. Native of dunghills, and rich moist ground, in Europe and America.

2. Xanthium Orientale; *Oriental Burrweed.* Stem thornless; leaves ovate, slightly three-lobed, somewhat triple-ribbed, wedge-shaped at the base. The difference between this and the preceding species seems to be the taper base of the leaves in the former, and the union of their three ribs, at a greater or less distance, above the insertion of the footstalk. The fruit is twice as large as that of the first species, with peculiarly strong hooked thorns.—Native of Ceylon, Japan, and China.

3. Xanthium Echinatum; *Compound-thorned Burrweed.* Stem thornless; fruit oval; its prickles hooked, crowded, compound at the base: annual.—Native place unknown.

4. Xanthium Spinosum; *Thorny Burrweed.* Stipules thorny, three-cleft; the thorns are in fact stipules, an inch long, very sharp, standing in pairs at the base of each footstalk, separating, just above their origin, into three spreading needle-like points; leaves lanceolate, three-lobed, hoary beneath, their upper surface is of a fine green, nearly smooth, the lower downy and white; flowers small, and inconsiderable; fruit oval, covered with copious, small, hooked prickles. The wild plant makes a conspicuous appearance in winter, on banks in the neighbourhood of Montpellier. It might be raised here as a tender annual, and planted out in a border, if there were sufficient beauty in its copious, long, flame-coloured thorns to place it in the garden; their leaves are not inelegant.—Native of the south of France, Italy, Spain, and Portugal.

5. Xanthium Fruticosum. Leaves pinnatifid; segments gashed. Stem shrubby, the height of a man, perennial, but scarcely woody, erect, roundish, obscure, somewhat hairy; branches axillary or lateral, short.—Native of Peru.

Xanthochymus; a genus of the class Polyadelphia, order Polyandria.—Generic Character. *Calix:* perianth inferior, of five roundish, unequal, obtuse, flattish, spreading, slightly imbricated, permanent leaves. *Corolla:* petals five, orbicular, nearly sessile, opposite to the calix-leaves, and twice as long; nectary of five broad, short, abrupt, porous glands, opposite to the petals, alternate with the stamina, inserted into the receptacle under the germen. *Stamina:* filamenta twenty, united into five oblong, linear, flat bodies, alternate with the nectaries, and above twice as long; antheræ stalked, roundish, of two lobes, and two cells. *Pistil:* germen superior, globose; style scarcely any; stigmas five, spreading horizontally, obtuse, deciduous. *Pericarp:* berry globose, succulent, with five ovate seeds, immersed in the pulp, some of which are generally abortive. Essential Character. *Calix:* of five leaves. *Petals:* five. *Nectaries:* five, abrupt. *Stamina:* united into five sets, alternate with the nectaries. *Berry:* with from one to five seeds.—— The only species is,

1. Xanthochymus Pictorius; *Painter's Golden Apple.* This is a large tree, the tall trunk of which is covered with dark rough bark, while the numerous smooth rather angular branches form an ample evergreen head. Leaves opposite, stalked, about a foot long, and two or three inches broad, elliptic-oblong, acute, entire, coriaceous, smooth, and shining, with a strong midrib, and many transverse, parallel, fine interbranching veins; footstalks an inch in length, angular, channelled, corrugated; stipules none; flowers an inch in diameter, five or six together, in stalked umbels, each umbel opposite to a leaf, or situated nearly where a last year's leaf has been; partial stalks simple,

smooth, nearly two inches long; petals white; stamina and pistil green; nectaries and antheræ yellow; fruit globular, drooping, somewhat pointed, orange-coloured, smooth, two inches or more in diameter; seeds about the size and shape of almonds.—It is a native of moist valleys, among the Circar mountains of Hindoostan, flowering in the hot season, and ripening fruit in November, December, and January. The fruit is very inviting to the eye, and in taste little inferior to many of our apples. When green, but full grown, it yields a large quantity of gum, very like gamboge. The best way to obtain it is by cutting the apples across, and to scrape off the juice as it rapidly issues. When recent, it is of the consistence of very rich cream, bright yellow, considerably acrid, and somewhat nauceous to the taste: in a few days it hardens, and becomes less acrid. It makes a pretty good water colour, either by itself as a yellow, or mixed with other colours to form green.

Xanthorrhiza; a genus of the class Pentandria, order Polygynia.—Generic Character. *Calix:* none. *Corolla:* petals five, ovate, acute, spreading, deciduous; nectaries five, abrupt, two-lobed, spreading, inserted into the receptacle, alternate with the petals, and about half as long. *Stamina:* filamenta five to ten, awl-shaped, very short; antheræ roundish. *Pistil:* germina several, seven to eleven, superior, oblong; styles awl-shaped, incurved; stigmas acute. *Pericarp:* capsules as many, inflated, ovate-oblong, bluntish and compressed at the top, where they burst, terminated obliquely by the styles, each of one cell and two valves. *Seeds:* solitary, oblong, compressed, small, pendulous from the top of the capsule. Essential Character. *Calix:* none. *Petals:* five. *Nectaries:* five, abrupt, stalked. *Capsules:* five or more. *Seed:* solitary, pendulous.——The only known species is,

1. Xanthorrhiza Apiifolia; *Parsley-leaved Yellow-root.* Stem shrubby, bushy, about a yard high, each branch crowned with a tuft of dark green, smooth, shining, long-stalked, pinnated leaves; the leaflets of which are an inch or an inch and half long, acute, rhomboid-lanceolate, sharply and unequally serrated in their fore-part; flowers in long panicled clusters, from the same bud as the leaves, of a dark copper-coloured purple, and though not brilliant, not inelegant, when contrasted with the foliage. The root and stem are internally of a bright lemon-colour. American physicians have used this plant successfully as a tonic or stimulant. It makes a yellow tincture, like that of Gentian in flavour and medical virtues.—Found on the shady banks of rivers, from Virginia to Georgia, flowering in May.

Xanthorrhœa; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* inferior, of one petal, in six deep, nearly equal, oblong, permanent segments; the three inner ones concave, converging at the base. *Stamina:* filamenta six, inserted into the lower part of the corolla, linear, flat, smooth, and naked, longer than the segments; antheræ versatile. *Pistil:* germen superior, ovate, with the rudiments of many seeds in each cell; style cylindrical, with three furrows; stigma simple. *Pericarp:* capsule projecting beyond the closed permanent corolla, ovate, with three blunt angles, woody, almost horny, polished, acute, of three cells and three valves; the partitions from the middle of each valve. *Seeds:* one or two in each cell, bordered, compressed, with a hard black shell, the scar at the base naked; embryo transverse; albumen soft and fleshy. Essential Character. *Corolla:* inferior, in six deep segments, permanent.—*Filamenta:* flat, linear, naked. *Capsule:* triangular, polished. *Seeds:* one or two, compressed, bordered. ——The species are,

1. Xanthorrhœa Arborea; *Arboreous Yellow-gum.* Stem arborescent; leaves two-edged, triangular beyond the middle, striated in front; stalk scarcely the length of the very long spike; bractes and corolla beardless. Each division of the thick stem is crowned with a large tuft of innumerable long slender drooping leaves, in the centre of which the flowerstalks stand solitary.—Native of New South Wales.

2. Xanthorrhœa Australis; *Southern Yellow-gum.* Stem arborescent; leaves compressed longitudinally; stalk shorter than the elongated spike; bractes subtending the tufts of flowers, elongated.—Native of the island of Van Diemen.

2. Xanthorrhœa Hastile; *Spear Yellow-gum.* Stem very short; leaves compressed longitudinally; stalk many times longer than the eighteen-inch spike; bractes and outer segments of the corolla, downy at the point. This plant produces its yellow resin by spontaneous exudation from the trunk. It is at first fluid, but soon hardens in the sun into a concrete brittle form, of a dull orange colour. If burnt upon hot coals, it emits a fragrant smoke, like a mixture of Balsam of Tolu and Benzoin, approaching in some degree to Storax. This resin is perfectly soluble in spirits of wine, but not in water, nor even in essential oil of turpentine, unless digested in a strong heat. The varnish it makes is weak, and of little utility: but it has been found a good pectoral medicine.—Native of New South Wales.

4. Xanthorrhœa Media; *Intermediate Yellow-gum.* Stem rather short; leaves compressed; stalk very long, many times exceeding the eighteen-inch spike; bractes and corolla beardless. This is suspected to be a variety of the preceding species.—Found near Port Jackson.

5. Xanthorrhœa Minor; *Lesser Yellow-gum.* Stem none; leaves triangular, flat in front, rather concave beyond the middle; stalk many times longer than the spike; bractes scarcely longer than the tufts of flowers, all like the corolla, beardless. The spike measures from five to eight inches.—Native of New South Wales.

6. Xanthorrhœa Bracteata; *Long-bracteated Yellow-gum.* Stem none; leaves triangular, below the middle somewhat elevated in front, beyond it rather concave; stalk many times longer than the spike, which is only from three to six inches in length; bractes subtending the tufts twice or thrice the length of the flowers, lanceolate, and divaricated, all, like the corolla, beardless.—Native of New South Wales.

7. Xanthorrœa Pumilio; *Dwarf Yellow-gum.* Stem none; leaves below the middle flattish, with a slightly elevated ridge on both sides, beyond it triangular and channelled; stalk many times longer than the ovate spike; bractes nearly equal, beardless, as well as the corolla. The flowerstalk is only a foot high.—Native of the tropical parts of New Holland.

Xanthosia; a genus of the class Pentandria, order Digynia. Essential Character. *Petals:* five, ovate. *Fruit:* ovate, striated, separable into two parts. *Involucrum:* of two leaves, single-flowered.——The only known species is,

1. Xanthosia Pilosa; *Hairy Xanthosia.* Leaves alternate, stalked, oblong, obtuse, sinuated, hairy beneath; flowers axillary, solitary, on short stalks; bractes two, awl-shaped, bristly at the base of each flower-stalk; involucrum of two obovate ribbed leaves half way up the stalk; stem shrubby, branched, hairy.—Native of Port Jackson.

Xanthoxylum; a genus of the class Dioecia, order Pentandria.—Generic Character. *Male. Calix:* perianth very small, in three or five deep, concave, rather acute segments. *Corolla:* petals three or five, oval, erect, concave, thrice the length of the calix. *Stamina:* filamenta three or five, awl-shaped, erect, longer than the petals; antheræ roundish,

two-lobed, furrowed. *Female. Calix:* like the male, inferior, permanent. *Corolla:* like the male, deciduous. *Pistil:* germina from two to five, roundish, each terminating in an awl-shaped style, longer than the petal; stigma obtuse. *Pericarp:* capsules from one to five, stalked, each of one cell, and two coriaceous valves, bursting at the inner margin. *Seeds:* solitary, roundish, polished, pendulous, from an upright bristle-shaped stalk. ESSENTIAL CHARACTER. *Male. Calix:* in three or five small deep segments. *Petals:* three or five. *Female. Calix:* like the male, inferior, permanent. *Petals:* three or five. *Capsules:* from one to five, of two valves, and one cell. *Seeds:* solitary, pendulous. The whole of this genus is shrubby or arboreous: the stem in most instances is armed with prickles: the wood is hard, and serviceable for many purposes. They are generally propagated by seeds, but, as they never ripen in this country, they must be procured from those places where they naturally grow; or the plants must be propagated by layers. When the seeds arrive in England, they should be sown in pots filled with light earth as soon as possible, for they do not grow the first year, and, when kept out of the ground till spring, frequently lie two years before they appear. The pots should be plunged in the ground up to their rims in an eastern-aspected border, where they may remain during the summer. The only care requisite for the seeds is to refresh them now and then with water in dry weather. In autumn the pots should be placed under a common hot-bed frame, where they may be screened from frost, or else plunged into the ground in a warm border, and covered with tan, to keep out the frost, and then plunged into the hot-bed in the succeeding spring. When they appear, water them often, but sparingly, and take out all the weeds. As the summer advances, gradually inure them to the open air; into which they should be removed in June, placing them in a sheltered situation, where they may remain till autumn, when they must return to the hot-bed frame, and remain there for the winter. In the spring following, before the plants begin to shoot, they should be carefully taken up, and each planted into a separate small pot, which may be plunged into a gentle hot-bed to forward them in putting out their roots. The after-care must be to shelter them for a year or two in winter, until they acquire strength: then in the spring, after the danger of frost is over, some of them may be turned out of the pots, and planted in the full ground in a warm sheltered situation. They may be increased by cutting off some of their strong roots, taking care to preserve their fibres; planting them in pots filled with light earth, and plunging the pots into a moderate hot-bed: but those raised from seeds grow largest, and are much healthier.——The species are,

* *Stem without Prickles.*

1. Xanthoxylum Ternatum; *Three-leaved Yellow Wood.* Prickles none; leaves ternate, obovate, slightly emarginate, shining, dotted beneath, on smooth, spreading, channelled footstalks; leaflets on small partial stalks, entire, rigid, veiny, contracted at the base, paler beneath, and minutely dotted with black; clusters axillary, compound; flowers small, whitish; germina three, contiguous, like one three-lobed germen; stigmas three, sessile; capsules three, each of two hemispherical valves, with two internal membranous whitish valves; seeds solitary, roundish, polished. This shrub is six feet high, with roundish subdivided branches, angular when young.—Native of the island of Dominica.

2. Xanthoxylum Emarginatum; *Emarginate Yellow Wood.* Prickles none; leaves pinnate, ovate, emarginate, veiny; leaflets about three pairs, rarely with an odd one, above an inch long, veiny, rather coriaceous, and shining; clusters terminal, somewhat compound, erect; flowers triandrous, minute, whitish; calix in five deep, ovate, acute, permanent segments; petals only three, ovate, concave, spreading, twice the size of the calix; stamina three, very short; germen three-lobed, with three sessile stigmas; capsule seldom more than one perfected, with two internal valves, and one orbicular, black, shining seed.—Native of the mountainous interior of Jamaica, where it is vulgarly called *Lignum Rorum*, a corruption of *Lignum Rhodium*; the smell of which every part of the shrub resembles, when rubbed or held near the fire.

3. Xanthoxylum Acuminatum; *Point-leaved Yellow Wood.* Prickles none; leaves pinnate, elliptical, pointed, coriaceous; leaflets three or four pairs, laurel-like, shining; cymes terminal, subdivided in a forked manner; flowers triandrous, crowded, small, white; calix of three minute oval leaves; petals three, obtuse, concave, one line and a half long; stamina three, shorter than the corolla; fruit globose, the size of a peppercorn, only one capsule out of three coming to perfection. A shrub, with round spreading branches.—Native of the mountainous parts of Jamaica.

** *Stem prickly.*

4. Xanthoxylum Punctatum; *Dotted Yellow Wood.* Stem prickly; leaves ternate or pinnate, oblong, finely crenate, dotted beneath.—Native of the island of Santa Cruz.

5. Xanthoxylum Spinosum; *Prickly Triandrous Yellow Wood.* Stem prickly; leaves about a foot long, pinnate, with many pairs of sessile, ovate, pointed leaflets, prickly beneath, as well as the branches; there are eight or ten pairs of leaflets in all, ovate, with a short emarginate point, veiny, rigid, smooth, and shining, very minutely crenate at the edges, their midrib occasionally prickly; spines scattered, prominent, needle-like, as long as the finger nail, those of the main stem stronger and thicker at the base; cymes terminal, with minute white crowded flowers; flowers triandrous; calix with three ovate-acute segments; petals three, ovate, larger than the calix; filamenta scarcely any; antheræ ovate, converging; germen in three distinct lobes; stigmas three, sessile, obtuse. This is a shrub, about six feet high, with a round branching upright stem.—Native of dry mountainous situations in Jamaica.

6. Xanthoxylum Clava Herculis; *Great Prickly Yellow Wood.* Stem armed with broad angular prickles, rising to the height of thirty or forty feet; leaflets ovate, pointed, crenate, nearly equal at the base; leaves a foot long; footstalks armed with straight prickles one-third of an inch long; leaflets about seven pairs, on short partial stalks, unequally divided by their smooth midrib, an inch and half or two inches long bordered with shallow unequal notches, smooth, and rather shining; clusters terminal, compound; flowers terminal, panicled, polygamous, there being some united ones, though not perfecting seed, on one tree, and others entirely female, on another; the former have a minute five-toothed calix; petals five, thrice as long, ovate, erect, or a little incurved; filamenta five, twice the length of the petals, and inserted between them; antheræ oblong, cloven at the base; germen roundish, abortive, with five awl-shaped erect styles, and simple stigmas.—Native of the woods in the West Indies and Carolina, flowering in March and April.

7. Xanthoxylum Aromaticum; *Aromatic Yellow Wood.* Stem with opposite prickles; leaflets ovate-lanceolate, serrated, unequal at the base, two, three, or four pairs, pointed, one inch and a half long, marked with pellucid dots, rounded near the base at the upper edge, contracted at the lower; common footstalk beset with strong nearly opposite prickles; panicles terminal.—Native of Chusan.

8. Xanthoxylum Rhoifolium; *Stomach-leaved Yellow Wood.* Stem prickly; leaves a foot long; leaflets lanceolate, finely

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XERANTHEMUM ANNUUM.—
Purple Xeranthemum, or Eternal Flower.

ZYGOPHYLLUM FABAGO.—
Common Bean Caper.

serrated, nearly equal at the base, from nine to eleven pairs, with an odd one, each three inches in length, pointed, dotted, slightly downy beneath; common footstalks downy and prickly, sometimes without prickles; panicles axillary.—Brought from the Chusan.

9. Xanthoxylum Juglandifolium; *Walnut-leaved Yellow Wood.* Stem prickly; leaves pinnate, with an odd one; leaflets oblong, pointed, obscurely serrated, unequal at the base, marked with obscure, distant, pellucid dots; common footstalk somewhat prickly; panicles terminal, much branched, dense, downy; capsules four or five, rather downy, pointed; seeds black.—Native of Hispaniola and Nevis.

10. Xanthoxylum Rigidum; *Rigid Yellow Wood.* Stem prickly; leaflets elliptical, entire, emarginate, pointed, their veins hairy beneath; midribs and footstalks prickly.—Native of South America.

11. Xanthoxylum Hermaphroditum; *Cayenne Yellow Wood.* Stem prickly; leaflets elliptic-oblong, pointed, entire, nearly equal at the base; common footstalk without prickles; panicles terminal, repeatedly compound; flowers united; capsules three, four, or five from each flower, reddish, each containing a black, shining, oily seed. These capsules have a pungent aromatic flavour, and the Creoles call them Negro's Pepper. This is a tree, the trunk forty or fifty feet high, and two feet and a half in diameter, with a prickly bark. The wood is white, hard, and compact.—Found in the forests of Cayenne; flowering in May.

12. Xanthoxylum Fraxineum; *Ash-leaved Yellow Wood*, or *Common Toothache Tree.* Stem prickly; leaflets ovate, very minutely serrated, equal at the base, four or five pairs, with an odd one, an inch and a half long, on short partial stalks, contracted at each end, more or less distinctly crenate, or bluntly serrated, smooth above, soft, and downy beneath; umbels axillary. The flowers are small, yellowish-green, in little dense umbels, just above the scars of last year's footstalks, accompanied by a tuft of downy young leaves. The mode of inflorescence abundantly distinguishes this species from all the rest. It is a large deciduous shrub; the branches are armed with sharp, conical, compressed, brown prickles, very broad at the base. A tincture of the bark and capsules is recommended in rheumatism, and the toothache, from which it derives its English name. The bark is used in America as a powerful sudorific and diuretic, whence its use, as above-mentioned, in rheumatic disorders.—It is a native of shady woods near rivers, from Canada to Virginia and Kentucky; flowering in April and May.

13. Xanthoxylum Tricarpum; *Three-grained Yellow Wood.* Stem prickly; leaflets stalked, oblong-oval, pointed, very smooth, finely serrated, oblique at the base; common footstalk prickly; capsules three, sessile.—It is a hardy shrub, flowering in July in the woods of Carolina and Florida.

14. Xanthoxylum Hetcrophyllum; *Various-leaved Yellow Wood.* Young branches prickly; their leaves with very numerous serrated leaflets, on prickly common stalks; old ones unarmed; their leaves of seven entire leaflets, on unarmed common stalks; panicles axillary; capsules solitary.—Found in the isle of Bourbon.

Xeranthemum; a genus of the class Syngenesia, order Polygamia-Superflua.—Generic Character. *Common Calix:* imbricated; scales numerous, elliptic-lanceolate, scariose, permanent, the inner one much longer than the disk, coloured, forming a radiant crown to the whole compound flower. *Corolla:* compound, somewhat unequal; florets of the disk very numerous, all perfect, tubular, funnel-shaped, much shorter than the calix, in five equal spreading segments, those of the circumference fewer, female, tubular, somewhat two-lipped, with five unequal segments. *Stamina:* (in the perfect florets) filamenta five, capillary, very short; antheræ forming a cylinder rather longer than the corolla. *Pistil:* (in the same florets) germen short; style thread-shaped, longer than the stamina; stigma cloven: in the female florets, stamina none. *Pistil:* germen and style as in the perfect florets; stigma simple, club-shaped. *Pericarp:* none, except the calix scarcely at all altered, except being closed. *Seed:* in both kinds of florets alike, oblong; down a row of taper-pointed narrow scales. *Receptacle:* flattish, clothed with linear acute scales, rather longer than the florets. Essential Character. *Receptacle:* scaly. *Down:* of taper-pointed scales. *Calix:* imbricated, its inner scales forming a coloured spreading radius.——The species are,

1. Xeranthemum Annuum; *Purple Xeranthemum*, or *Everlasting Flower.* Outer calix-scales roundish-elliptical, awned, smooth at the keel; inner lanceolate, spreading; crown of the seed lanceolate, shorter than the calix. Stem erect, branching, bearing linear-lanceolate, white, cottony leaves, and numerous flowers, an inch or more in diameter. The outer calix-scales are membranous and shining, pale, quite smooth, each with a red or brownish midrib, most conspicuous upwards, and terminating in a small awn-like point. The variety from the Valais has flowers of a smaller diameter, and a less spreading calix; but we do not find that its outer scales are more acute, though somewhat variable in that respect; the inner are less strikingly purple, and turn browner as they fade. The semidouble kind is especially preferred for cultivation. The flowers, with their stalks dried quickly, preserve their purple colour long, and form a part of the winter decorations for a chimney-piece; but for this purpose the back of every coloured scale of the calix should be drawn, while fresh, over the edge of a blunt knife, to keep the flower open after it is dried. This species is hardy, annual, common in our gardens, flowering in July and August.—Native of dry hilly ground in Austria, France, Italy, and Greece.—*Propagation and Culture.* The first species, and its varieties, are increased by sowing their seeds in pots of light fresh mould in the autumn or spring, or in other seasons for a succession, plunging them in a moderate hot-bed to bring the plants forward. In the spring they may also be sown in patches where they are to remain, or in beds, to be afterwards removed. When the plants have a few inches' growth, they should be pricked out in rows a foot apart on beds, or in the borders, clumps, or other places, where they are to grow. They should afterwards be kept clean from weeds, and have occasional waterings immediately after pricking out, and afterwards in dry weather.

2. Xeranthemum Cylindriaceum; *Cylindrical Xeranthemum.* Outer calix-scales elliptical, pointless, woolly at the keel; inner lanceolate, erect. This is distinguished from the preceding species by its strong disagreeable smell.—Native of Germany, also of Asia Minor.

3. Xeranthemum Orientale; *Oriental Xeranthemum.* Outer calix-scales roundish, membranous; inner ovate, pointed, erect; crown of the seed ovate, awned, longer than the calix. The leaves of this species appear to be broader and more elliptical than either of the foregoing. But its most striking difference is visible in the ovate scales, forming the crown of the seeds, each of them ending in a long point, for overtopping the upright radiant scales of the calix.—Native of Armenia and Syria.

4. Xeranthemum Vestitum; *Leafy-flowered Eternal Flower.* Shrubby, erect: leaves sessile, lanceolate-linear, woolly, tomentose, sharpish, the floral ones appendicled with a membrane at the tip; branches one-flowered.—Native of the

Cape.—This, with the 6th, 8th, 9th, 14th, and 19th species, are raised by planting cuttings of the young shoots in the summer, in pots filled with light mould, giving them a little water and shade; or, which is better, plunging them into a hot-bed, and covering them with hand-glasses. When they are become firmly established in the autumn, they should be carefully removed into separate pots, being replaced in the hot-bed till re-rooted, after which they should have the management of other shrubby green-house plants.

5. Xeranthemum Spirale; *Spiral-leaved Xeranthemum.* Shrubby, erect: leaves sessile, lanceolate, tomentose, keeled beneath, and spirally imbricate; branches one-flowered.—Native of the Cape.

6. Xeranthemum Speciosissimum; *Golden Eternal Flower.* Shrubby, erect: leaves sessile, lanceolate-obovate, acute, three-nerved, woolly, tomentose; branches one-flowered.—Native of the Cape. See the 4th species.

7. Xeranthemum Fulgidum; *Great Yellow-flowered Xeranthemum.* Suffruticose, erect: leaves embracing, ovate-lanceolate, pubescent beneath, tomentose at the edge; branches subtriflorous.—Native of the Cape of Good Hope.

8. Xeranthemum Proliferum; *Proliferous Eternal Flower.* Shrubby, branched, diffused, proliferous: leaves roundish, ovate, smooth, convex, closely imbricate; flowers sessile; branches spreading, rigid; ray of the flowers very shining, blood-red.—Native of the Cape. See the 4th species.

9. Xeranthemum Imbricatum; *Imbricated Eternal Flower.* Shrubby, branched: leaves oblong, lanceolate, silky, imbricate; branches one-flowered; pedunceles scaly.—Native of the Cape. See the 4th species.

10. Xeranthemum Canescens. Shrubby, erect: leaves oblong, obtuse, imbricate; branches one-flowered; calix-scales ovate.—Native of the Cape.

11. Xeranthemum Bellidioides. Herbaceous: leaves ovate, embracing, snowy, tomentose beneath; branches one-flowered; pedunceles naked.—Native of New Zealand.

12. Xeranthemum Argenteum. Shrubby, erect: leaves oblong, silky, recurved.—Native of the Cape.

13. Xeranthemum Recurvatum. Shrubby, erect: leaves lanceolate, tomentose, ciliate, recurved; branches one-flowered.—Native of the Cape.

14. Xeranthemum Retortum; *Reflexed-leaved Eternal Flower.* Shrubby, branched, decumbent: leaves lanceolate, silky, somewhat recurved; branchlets one-flowered; peduncles scaly.—Native of the Cape, and of Cochin-china. See the 4th species.

15. Xeranthemum Stoloniferum. Herbaceous, creeping: leaves lanceolate, silky, recurved, spreading; branches one-flowered.—Native of the Cape.

16. Xeranthemum Radicans. Herbaceous, creeping: leaves ovate, obtuse, silky, reflexed.—Native of the Cape.

17. Xeranthemum Frigidum. Herbaceous, branched, procumbent: leaves imbricate, in four rows, oblong, blunt, hoary; branches one-flowered; flowers sessile.—Found on Mount Libanus, and in Corsica.

18. Xeranthemum Spinosum. Shrubby, erect: leaves lanceolate, obtuse, tomentose; branchlets one-flowered; calix-scales mucronate, spiny.—Native of the Cape.

19. Xeranthemum Sesamoides; *Silvery Eternal Flower.* Shrubby, erect: leaves acerose, linear, keeled, smoothed, pressed close; branches one-flowered; flowers sessile.—Native of the Cape. See the 4th species.

20. Xeranthemum Fasciculatum. Shrubby, erect: leaves acerose, linear, subcylindrical, tomentose above, lower spreading, upper pressed close; branches one-flowered; peduncles scaly.—Native of the Cape.

21. Xeranthemum Virgatum. Shrubby, erect: leaves lanceolate, tomentose, remote, spreading; branches one-flowered; flowers peduncled.—Native of the Cape.

22. Xeranthemum Striatum. Leaves linear, nerved, villose; stem erect.—Native of the Cape.

23. Xeranthemum Paucifolium. Leaves lanceolate, acute, silvery; peduncles scaly.—Native of the Cape.

24. Xeranthemum Stæpelina. Shrubby, erect: leaves oblong, lanceolate, attenuated at the base, silky; peduncles naked, one-flowered, terminating.—Native of the Cape.

25. Xeranthemum Variegatum. Shrubby, erect, branched: leaves oblong, tomentose, imbricate; branches one-flowered; flowers nodding.—Native place uncertain.

26. Xeranthemum Paniculatum. Shrubby, erect: leaves linear, lanceolate, silky; corymb simple, terminating.—Native of the Cape.

27. Xeranthemum Chinense. Stem herbaceous, quite simple; leaves lanceolate, serrate.—Native of the Cape of Good Hope.

Xerochloa; a genus of the class Triandria, order Digynia. Essential Character. *Calix:* two-flowered, of two unequal valves, parallel to the hollow of the receptacle, and half sunk therein, the outer valve smallest. *Corolla:* of both flowers longer than the calix, of two valves, awl-shaped, membranous, awnless. *Stamina:* in the outermost flower. *Styles:* in the inner one, combined at the base. *Nectary:* none. *Seed:* enclosed in the inner paper-like valve of the corolla.—This genus consists of perennial, rushy, dry, smooth grasses. The stem is terminated by alternate sheaths, each containing from two to four short spikelets, of few flowers; the leaves awl-shaped, straight and stiff, with a very short stipula.——The species are,

1. Xerochloa Imberbis; *Beardless Xerochloa.* Spikelets awl-shaped, slightly curved; inner valve of the male flowers smooth.—Found in New Holland.

2. Xerochloa Barbata; *Bearded Xerochloa.* Spikelets lanceolate, straight; inner valve of the male flowers bearded.—Native of the same country.

Xerophyta; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* of one petal, superior; limb in six deep ovate-oblong, acute, permanent segments; the three outer ones narrowest, spinous-pointed, stoutest, externally glandular. *Stamina:* filamenta six, inserted into the lower part of each segment, thread-shaped, very short, equal; antheræ erect, linear, half as long as the corolla. *Pistil:* germen inferior, turbinate; style one, short; stigma tumid, oblong, undivided. *Pericarp:* capsule oval, rough, crowned with the faded corolla, with three cells and many seeds. Essential Character. *Corolla:* in six deep segments, permanent; three outermost narrowest, spinous-pointed. *Stamina:* inserted into the base of each segment. *Stigma:* club-shaped. *Capsule:* inferior, of three cells, with many seeds.——The only known species is,

1. Xerophyta Pinifolia; *Fir-leaved Xerophyta.* Leaves alternate, two inches or more in length, linear, rigid, channelled, striated, with thick entire edges, and a pungent spinous point, their base sheathing, fibrous, and rather woolly; flowers terminal, one or two at the end of each branch, on simple stalks, an inch long, rough, like the germen, with minute prominent glands, of which some traces are also found on the backs of the three outward segments of the corolla; the colour, of the inner segments at least, appears reddish. Each flower is about half the size of a Snowdrop. It is a hard rigid shrub; the stem is round, alternately branched; the wood formed of parallel tubes; branches a quarter of an inch in diameter, thickly clothed

with the imbricated, deeply furrowed, permanent sheaths of the last year's foliage, each crowned with the reflexed base of a leaf, by which the whole branch assumes a singular scaly appearance.—Native of Madagascar.

Xerotes; a genus of the class Dicœcia, order Hexandria.—Generic Character. *Male. Calix:* perianth of six regular, ovate, coloured leaves; the three innermost, or perhaps all the six, connected at the base. *Corolla:* none, unless the calix be so called. *Stamina:* filamenta six, very short, inserted into the base of each leaf of the calix; antheræ orbicular, peltate. Some rudiments of a pistil. *Female. Calix:* perianth of six separate permanent leaves. *Corolla:* none. *Stamina:* imperfect. *Pistil:* germen superior, ovate, with three furrows; styles three, short, combined at the base; stigmas obtuse. *Pericarp:* capsule cartilaginous, coated, of three cells and three valves, with partitions from the centre of each valve. *Seeds:* solitary, peltate. Essential Character. *Male. Calix:* of six leaves, three innermost combined at the base. *Corolla:* none. *Antheræ:* peltate. *Female. Calix:* of six separate permanent leaves. *Styles:* three. *Capsule:* superior, coated, of three cells; valves with central partitions. *Seeds:* peltate, solitary.—This genus consists of perennial herbs, of a dry rigid texture; root fibrous; stem none, or generally very short; leaves grassy, linear; the flowers terminating the stem, or radical stalk, either panicled, racemose, spiked, or capitate.——The species are,

* *Female flowers in solitary heads; Leaves entire at the extremity.*

1. Xerotes Flexifolia; *Spiral-leaved Xerotes.* Stem somewhat branched, woody at the base, about a foot high; leaves shorter than the branches, two-ranked, twisted, their edges rough with minute teeth, their points withering, acute, an inch or an inch and half long; male spikes interrupted, somewhat branched, longer than the leaves; male flowers small, whitish, separated into little whorl-like tufts, accompanied by brown scaly bractes; female flowers rather larger, in round solitary heads, terminating short leafy branches in the forks of the stem.—Native of New South Wales.

2. Xerotes Mucronata; *Pointed Xerotes.* Stem somewhat branched; leaves shorter than the branches, but longer than the male spikes, two-ranked, straight, or slightly twisted; their points withering, acute; their margins roughish, with very minute teeth, dilated and entire at the base.—Native of Port Jackson.

3. Xerotes Collina; *Hill Xerotes.* Leaves taller than the stem, narrow and straight, rough, with marginal teeth, withering and very acute at the point, dilated and jagged at the base; head of female flowers sessile.—Found on the southern coast of New Holland.

4. Xerotes Glauca; *Glaucous Xerotes.* Leaves taller than the stem, narrow and straight, withering, and bluntish at the point, rough, with marginal teeth, dilated and jagged at the base; tufts of flowers in the male spikes sessile.—Found on the south coast of New Holland.

5. Xerotes Leucocephala; *White-headed Xerotes.* Male, as well as female flowers, capitate; receptacle woolly; leaves narrow, smooth-edged, longer than the perfectly simple stalk, bearing one or two heads of flowers; stem short.—Native of the tropical part of New Holland.

** *Female flowers racemose or spiked; male one racemose or panicled; partial stalks scattered; flowers drooping.*

6. Xerotes Pauciflora; *Few-flowered Xerotes.* Flowers few in the male cluster, in distant whorls; leaves very narrow, acute, and smooth, dilated and entire at the base, shorter than the divided stem.—Found near Port Jackson.

7. Xerotes Filiformis; *Thread-shaped Xerotes.* Leaves thread-shaped, semicylindrical, elongated, flattened in front, rough-edged, finely striated at the back, round at the point, a span long or more in length, erect, rigid, very slender: male cluster scarcely branched; flowers scattered, or in pairs, drooping, whitish, small; the outer segments of the calix smaller and more membranous than the inner; bractes awl-shaped, acute at the base of the partial stalks; root woody; stem short, scarcely any. There are three varieties. The first, with the male perianth nearly globular, twice the length of the partial stalk: the second, with the male perianth nearly globular, and the partial stalk longer than that part, or the bractes: the third, male perianth turbinate; partial stalk shorter than it, or the bractes. The leaves appear to vary in breadth and flatness.—Found near Port Jackson.

8. Xerotes Tenuifolia; *Fine-leaved Xerotes.* Leaves thread-shaped, elongated, channelled in front, deeply striated at the back; male clusters somewhat divided, their branches alternate; stem short.—Found on the southern coast of New Holland.

9. Xerotes Gracilis; *Slender Xerotes.* Leaves very long and narrow, channelled, striated beneath, flat and entire at the point; male panicles lax, alternately branched; partial stalks solitary; stem short.—Found near Port Jackson.

10. Xerotes Denticulata; *Small-toothed Xerotes.* Leaves elongated, thread-shaped, compressed, channelled, with two or three terminal teeth; male clusters simple or divided; stem short.—Found at Port Jackson.

11. Xerotes Laxa; *Loose-flowered Xerotes.* Leaves elongated, linear, flat, entire at the point; male panicles loose, with whorled branches, and distant clusters; partial stalks solitary, shorter than the nearly globular perianth, but longer than their minute bractes.—Found in New South Wales.

*** *Flowers either spiked or panicled, their branches or tufts opposite or whorled. Male Perianths sessile, imbricated with bractes. Capsule smooth. Leaves toothed at the end.*

12. Xerotes Rigida; *Rigid Xerotes.* Stem very short; stalks and spikes much shorter than the foliage; leaves two-ranked, cartilaginous, convex beneath, abrupt, with two marginal teeth at the end, smooth at the edges, dilated and entire at the base, a span long, full a quarter of an inch broad, thick, rigid, smooth, greatly dilated, and bordered with a membrane at the base, singularly abrupt, and three-pointed at the end; common flower-stalk terminal, thick, sharply two-edged, sometimes triangular, smooth; tufts of flowers one above another, not numerous, forming an interrupted, branched, upright spike, each accompanied by several unequal, lanceolate, acute bractes; three alternate stamina longer than the rest, and bear eloven not bordered antheræ.—Found in the south part of New Holland.

13. Xerotes Montana; *Mountain Xerotes.* Stem none; leaves elongated, linear, flat, membranous, smooth-edged, their sharp point with two very short lateral teeth; female spike undivided, many times shorter than its stalk.—Found near Port Jackson.

14. Xerotes Fluviatilis; *River Xerotes.* Stem none; leaves elongated, narrow, channelled, smooth-edged, two or three toothed, with an acute sinus at the extremity; female spikes divided or simple; bractes rather rigid, twice as long as the tufts of flowers.—Found on the banks of rivers in New South Wales.

15. Xerotes Longifolia; *Long-leaved Xerotes.* Stem none; leaves elongated, linear, coriaceous, erect, irregularly toothed at the point, rough-edged, a foot and half long, somewhat striated, dilated at the base, and bordered in that part with a membrane, which at length separates, and becomes torn:

panicles lanceolate, rather dense, with opposite branches; flower-stalk flattish; flowers more numerous and crowded than in the twelfth species, with long taper-pointed bractes; capsule ovate, acute, thrice as long as the calix, chestnut-coloured, pale yellow at the base, its coat separating in irregular fragments; antheræ uniform.—Found near Port Jackson and at Cape Diemen.

16. Xerotes Hystrix; *Porcupine Xerotes.* Stem none; leaves elongated, linear, lax, smooth-edged, somewhat toothed at the extremity, a foot and half or two feet long, spreading; stalk rather convex on both sides; male panicles repeatedly compound, with whorled branches; flower-stalks of the male plant numerous, erect, two-edged, though convex at each side, from one to one and a half feet high, somewhat zigzag occasionally, each bearing a flattish panicle, from six to fourteen inches long, composed of numerous triangular branches, from four to eight in a whorl, beset with numerous tufts or whorls of sessile flowers, accompanied by several chaffy inner bractes, and subtended by about three long, spreading, external ones, with needle-like points; bractes leafy, rigid, spinous, pointed.—Found near Port Jackson. It deserves a place in the green-house for its fragrance and singular appearance.

17. Xerotes Arenaria; *Sand Xerotes.* Stem none; leaves elongated, linear, smooth-edged, jagged, and toothed at the end; male panicle simple, with opposite branches; tufts of flowers globose; bractes awl-shaped, reflexed; flowers obtuse.—Discovered in the tropical parts of New Holland.

**** *Male Panicle whorled; Flowers stalked, in drooping tufts; Capsule rugged; Leaves entire at the point.*

18. Xerotes Distans; *Distant-flowered Xerotes.* Stem none; leaves very long, channelled, very rough at the edges; male panicle with undivided branches, and distant tufts of flowers; partial stalks shorter than the calix. The male panicles are a foot long; calix about a line and half.—Native of the tropical part of New Holland.

19. Xerotes Media; *Intermediate Xerotes.* Stem none; leaves very long, channelled, smooth-edged; branches of the male panicle undivided; flowers five or six in each tuft, their partial stalks scarcely so long as their very short calix; female spike divided in the lower part, each branch bearing one head of flowers; calix only one third of a line in length; male panicle six inches.—Native of New Holland.

20. Xerotes Decomposita; *Compound Xerotes.* Stem none; leaves very long, channelled, smooth-edged; male panicle repeatedly compound; tufts of few flowers; partial stalks hardly so long as the calix; male panicles a foot long.—Native of the tropical part of New Holland.

21. Xerotes Multiflora; *Many flowered Xerotes.* Stem none; leaves very long, channelled, smooth at the back and edges; male panicle with undivided branches, each bearing from one to three many-flowered tufts; partial stalks longer than the calix.—Found in the tropical parts of New Holland.

22. Xerotes Æmula; *Rough Long-leaved Xerotes.* Stem none; leaves very long, channelled, erect, rough at the back and edges; male panicle with undivided branches, each bearing from one to three many-flowered tufts; partial stalks longer than the calix. The roughness of the leaves distinguishes this from the preceding species.—Found in the country near Port Jackson.

23. Xerotes Banksii; *Banksian Xerotes.* Caulescent: leaves two-ranked, flat, rough-edged; female panicle dense, about the length of its two-edged stalk; branches quadrangular, very short.—Found in the tropical part of New Holland.

***** *Flowers of each sex in a cylindrical catkin-like Spike.*

24. Xerotes Hastilis; *Spear-stalked Xerotes.* Stem none; spike very long; stalk round; leaves elongated.—Native of the southern coast of New Holland.

Ximenia; a genus of the class Octandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, very small, in four pointed permanent segments. *Corolla:* petals four, oblong, hairy internally, their lower half erect, forming a tube, their upper part revolute. *Stamina:* filamenta eight, erect, short; antheræ erect, longer than the filamenta. *Pistil:* germen superior, oblong; style thread-shaped, the length of the stamina; stigma obtuse. *Pericarp:* drupe nearly ovate. *Seed:* nut solitary, roundish. Essential Character. *Calix:* four-cleft. *Petals:* four, hairy internally, revolute at the upper part. *Drupe:* superior. *Nut:* solitary.——The species are,

1. Ximenia Americana; *Thorny Ximenia.* Branches spinous, round, striated; leaves oblong, two or three together, in alternate tufts, from buds of many years' duration, stalked, elliptic-oblong, obtuse, with a minute point, rarely emarginate, entire, single-ribbed, smooth on both sides, about two inches long; footstalks a quarter of an inch long, smooth; thorns lateral, erect, longer than the footstalks, awl-shaped, stout, but sparingly produced; flower-stalks axillary, or rather from the same bud as the leaves, not half their length, deflexed, round, divided into from three to five smooth, single-flowered, partial stalks; calix spreading, quadrangular; petals four, whitish, shaggy from the base almost to the apex, on the inside, smooth externally; fruit the size of a small apple, yellow when ripe: the pulp, being sweet, is eaten by negroes and children. The flowers smell like burnt frankincense. The stem is shrubby or arboreous.—It is a native of the island of Hispaniola, and ripens its fruit there in December. This, and the third species, are propagated by seeds, which must be procured from the countries where they naturally grow. They should be sown in pots filled with light earth, and plunged into a good hot-bed of tanners' bark. If the seeds be fresh, the plants will appear in six weeks or two months. When they are about three feet high, they must be each carefully transplanted into a separate small pot, filled with light earth, and plunged into a good hot-bed of tanners' bark, shaded from the sun, till they have taken new root. During the first summer they may be kept in the tan-bed, under frames, where they will thrive better than in the stove, but in autumn, when the nights grow cool, they must be plunged into the tan-bed, where they must be always kept, observing to shift them into larger pots when it is required. They require a large share of free air in warm seasons; but do not flower readily in this country.

2. Ximenia Elliptica; *Elliptical Ximenia.* Thorns none; leaves elliptic-lanceolate; stalks many-flowered.—Native of New Caledonia.

3. Ximenia Inermis; *Jamaica Ximenia.* Thorns none; leaves ovate; stalks single-flowered. It is a bushy tree, not above eight or nine feet high, with a trunk of about four inches and a half in diameter.—Native of Jamaica.

Xiphidium; a genus of the class Triandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* inferior, of six petals, regular, permanent, the three outer ones largest. *Stamina:* filamenta three, linear, opposite to the three inner petals; antheræ ovate. *Pistil:* germen superior, globose; style thread-shaped; stigma simple. *Pericarp:* capsule at first fleshy, then dry, roundish, with three furrows, and three cells. *Seeds:* numerous, roundish, pointed, inserted into a fleshy, central, nearly globular receptacle. *Observe.* The regularity of the flower at once distinguishes this genus

from *Wachendorfia*. ESSENTIAL CHARACTER. *Corolla:* regular, of six petals. *Capsule:* superior, of three cells, with many seeds.——The species are,

1. Xiphidium Album; *White-flowered Xiphidium.* Leaves smooth; petals linear-lanceolate.—Native of the West Indies.

2. Xiphidium Cœruleum; *Blue-flowered Xiphidium.* Leaves numerous, alternate, sessile, somewhat sheathing, sword-shaped, pointed, entire, or minutely serrated, striated, with numerous longitudinal ribs; cluster compound, terminal, erect, of many spreading, simply racemose branches, more or less hairy; with a very minute bracte under each partial flowerstalk; flowers not half an inch in diameter; three outer petals green, and often downy at the back, white or blue in front, as are the three inner on both sides. Root perennial, somewhat creeping, jointed; stem a foot or more in height, round, simple, as thick as the little finger, leafy in the lower part, more or less minutely hairy.—Native of South America, as well as of the islands Tobago and St. Kitt's.

Xylocarpus; a genus of the class Octandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth inferior, of one leaf, club-shaped, coriaceous, somewhat coloured, with four roundish teeth. *Corolla:* petals four, ovate-oblong, rather coriaceous, widely spreading, twice the length of the calix; nectary erect, ovate, inflated, somewhat fleshy, with eight marginal segments. *Stamina:* filamenta no other than the eight segments of the nectary, linear, obtuse, emarginate, shorter than the petals; antheræ eight, attached to the inner side of the filamenta, and of the same length, linear, oblong. *Pistil:* germen superior, ovate, smooth, slightly rugged at the base; style very short and thick; stigma abrupt, broad, bordered, its margin furrowed, its disk furrowed crosswise, and perforated. *Pericarp:* drupe large, globose, dry, with a thick coat, externally smooth, marked with four or five furrows, internally woody and fibrous. *Seeds:* nuts eight, ten, or more, angular, unequal, irregular; their outer skin soft, and rather silky, inner woody and fibrous; kernel in some degree woody, brittle, with a prominent embryo. ESSENTIAL CHARACTER. *Calix:* oblong, with four teeth. *Petals:* four. *Nectary:* inflated, with eight teeth, bearing the antheræ. *Drupe:* superior, dry, woody, with four or five furrows. *Nuts:* numerous, angular, irregular.——The only known species is,

1. Xylocarpus Granatum; *Indian Wooden Pomegranate.* Leaves opposite, stalked, spreading, oblong, obovate, or elliptical, acute, entire, rather larger than those of an apple-tree, dark green, smooth and shining on the upper side, veiny beneath, with a prominent midrib; footstalks short, roundish, spreading, a little curved, rugged, of a chestnut brown; clusters scattered, or axillary, stalked, rather spreading, shorter than the leaves; their subdivisions opposite, or three-forked, with round, smooth, red, tough, naked stalks; flowers yellowish, or dirty white, scentless. The fruit is larger than a Pomegranate, sometimes as big as a small Melon. It contains from eight to twenty angular, unequal nuts, larger than chestnuts. The tree varies greatly in size, being sometimes little more than a shrub; the wood is elegantly veined, but so twisty and knotty that no large pieces can be obtained: its trunk is erect, with a hard deeply-cracked bark; the head dense, roundish, or oblong.—Native of the muddy thickets on the sea-shores of Amboyna, Ceylon, and other parts of the East Indies.

Xyloma; a genus of the class Cryptogamia, order Fungi. ESSENTIAL CHARACTER. Flat, nearly orbicular. *Receptacle:* various, hard, somewhat fleshy internally, either remaining closed, or bursting unequally. *Observe.* This genus is distinguished by its internal solidity, being of a corky or woody substance, having nothing of a gelatinous nature; and, from the minuteness of the species, are good subjects for microscopical observation.——The species are,

* *Compound. Several Receptacles combined; rather large.*

1. Xyloma Salicinum; *Sallow-leaf Xyloma.* Thick, tuberculated, internally cartilaginous, and white at the base. Persoon remarks, that this is generally closed, though he has found it, in the spring, breaking the upper part, into several portions, like the shell of a tortoise, from the interstices of which the fine powdery seeds fly off like smoke. It is black, and about an inch and half broad. Common on the leaves of *Salix Capræa.*

2. Xyloma Andromedæ; *Marsh Rosemary Xyloma.* Oblong, thickish, with rib-like elevations, polished. It is rather thick for its size; the lower stratum white and firm, as in the preceding. It is found, in summer, on the leaves of *Andromeda Polifolia,* which appear as if spotted with pitch in consequence. Sometimes each fungus is as long as the whole leaf, sometimes only half as long.

3. Xyloma Acerinum; *Maple Xyloma.* Dilated, somewhat orbicular, thin, flat, black, slightly corrugated towards the centre. It consists of numerous, black, opaque inseparable patches, scattered over the upper side of the leaf, each about a quarter or one third of an inch in diameter; the margin sometimes variously and elegantly notched or fringed, and always circumscribed by a very striking yellow, or tawny discoloration of the leaf.—Found in autumn on the leaves of *Acer Platanoides* and *Campestre.*

4. Xyloma Punctatum; *Sycamore Xyloma.* Dilated, thin, imperfectly orbicular, somewhat convex, black; receptacles unequal, aggregate, parallel, oblong, blunt, superficial.—It is frequent on the faded or fallen leaves of *Acer Pseudoplatanus,* which is seldom found free from it in autumn and winter. The patches of this parasite are from half an inch to an inch wide, closely united with the leaf, slightly convex above, and rather concave at the under side, which is rather blackened by them, especially at the circumference of each.

5. Xyloma Stellare; *Starry Xyloma.* Thin, pitchy, the margin fringed with radiating fibres; about half an inch broad, more or less, of a handsome appearance, with an uniform smooth disk, very black; the marginal fringe either black or grayish.—Sometimes found on the leaves of *Phyteuma Spicatum.*

6. Xyloma Rubrum; *Red Xyloma.* Aggregate, orbicular, somewhat confluent, red. The patches are each from two to four lines broad, rather thick, with darker coloured superficial dots, visible only with a microscope. The genus of this species is doubtful.—It generally occurs in autumn on the leaves of *Prunus Domestica.*

** *Simple. Receptacles solitary, scattered, generally cupped or dotted: smaller.*

7. Xyloma Pezizoides; *Cup-like Xyloma.* Rather crowded, orbicular, black, opening at length with an upright somewhat crenate border, and a pale olive or greenish disk.—Found upon fallen leaves of Oak, in December; and upon Beech leaves, but not in such perfection: something larger than a Mustard-seed.

8. Xyloma Sphærioides; *Dot-like Xyloma.* Scattered, dot-like, softish, with an open disk, and a collapsed, inflexed border. The outside is black; the disk, which is rarely all displayed, appears paler.—Found upon the leaves of *Salix Capræa.*

9. Xyloma Hysterioides; *Oblong Xyloma.* Elliptical, shining, ranged nearly parallel. Each plant is a third of a line long, black, solid within: a longitudinal line seems to

mark the place where it finally bursts.—Found upon fallen Hawthorn leaves in spring.

10. Xyloma Salignum; *Willow Xyloma.* Aggregate, and rather crowded, orbicular, thin, with a somewhat convex disk.—Found upon the leaves of *Salix Capræa.*

11. Xyloma Populinum; *Aspen Xyloma.* Aggregate, flattened, variously shaped, smooth, opaque, black. This is about a line broad; the disk is grayish in some places.—Found in the spring on the old leaves of *Populus Tremula.*

12. Xyloma Concentricum; *Concentric Xyloma.* Simple; receptacles small, orbicular, depressed, somewhat conical, concentrical, of a sooty gray. Receptacles like small scattered dots, at first black, afterwards sooty or grayish, bursting finally at the summit.—Found on the half-decayed leaves of *Populus Tremula.*

13. Xyloma Fagineum; *Beech Xyloma.* Minute, crowded, of a shining black, orbicular, plaited, a little depressed.—Found like black dots on the under side of fallen and dried Beech leaves.

14. Xyloma Alneum; *Alder Xyloma.* Minute, scattered, roundish, plaited.—This species consists of a few black distinct dots, which are found in summer upon green Alder leaves.

Xylomelum; a genus of the class Tetrandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* petals four, regular, equal, linear, externally hairy, a little dilated and concave at the tip, revolute soon after expansion; nectary four glands at the base of the germen. *Stamina:* filamenta four, very short, inserted rather above the middle of each petal, and becoming prominent by its recurvation; antheræ linear, inflexed, of two lateral parallel lobes, with a membranous edge, imperfect in some of the flowers. *Pistil:* germen superior, roundish; style ereet, rigid, the length of the petals, deciduous; stigma vertical, club-shaped, obtuse, often small and abortive. *Pericarp:* follicle woody, very thick, ovate, of one excentric small cell, and bursting into two divarieated half valves at the point. *Seed:* two, roundish, compressed, each with a terminal, oblong, rather oblique, membranous wing, as long as the follicle. Essential Character. *Petals:* four, bearing the petals above the middle, regular, revolute. *Nectariferous Glands:* four. *Stigma:* club-shaped. *Style:* deciduous. *Follicle:* woody, of one excentric cell, with two winged seeds.——The only known species is,

1. Xylomelum Pyriforme; *Wooden Pear.* It is a tree, with opposite branches, downy and rusty when young; leaves opposite, stalked, five inches long, lanceolate, acute at each end, entire, rather coriaceous, smooth, with one rib, and many prominent reticulated veins, pale and yellowish beneath, clothed, when they first come out, with dense, deciduous, rusty down; footstalks flattish, an inch long, smooth; stipules none; spikes axillary, opposite, catkin-like, cylindrical, dense, much shorter than the leaves, many-flowered, shaggy with rusty down; flowers sessile, hardly an inch long, in pairs, each pair accompanied with one small downy bracte. The fruit is ovate, or inversely pear-shaped, very hard, even, downy, two or three inches in length; seeds and wings brown.—Found on the eastern coast of New Holland, growing on stony hilly ground.

Xylophylla; a genus of the class Monœcia, order Monadelphia.—Generic Character. *Male. Calix:* perianth in six deep regular segments; the three innermost largest. *Corolla:* petals none, unless the calix or its inner segments be taken for such; nectary of six globular glands. *Stamina:* filamenta united into a very short column; antheræ three or six, roundish, two-lobed. *Female,* on the same plant, and in the same situation, as the male. *Calix:* and *Nectary:* as in the male. *Pistil:* germen superior, sessile, roundish; styles three, short, spreading; stigmas three-cleft. *Pericarp:* capsule roundish, with three furrows, three cells, and six elastic valves. *Seeds:* two in each cell, roundish. Essential Character. *Male. Calix:* in six deep segments, three of them interior. *Petals:* none. *Nectary:* of six globose glands. *Female. Calix* and *Nectary:* like the male. *Styles:* three. *Stigmas:* three-cleft. *Capsule:* of three cells, with six elastic valves. *Seeds:* two in each cell.—The plants of this genus are increased by sowing the seeds in pots in the early spring, and plunging them in a hot-bed; when the plants are come up two or three inches in growth, they should be pricked out in separate pots, replunging them in the bark-bed: they may afterwards be managed as other stove plants, of a similar growth. Some of the species may be raised in a hot-bed by offsets, slips, and cuttings. They require the constant protection of the stove in winter, but in the hot summer months may be set out in their pots, in a sheltered situation, being taken in on the approach of cold nights. They afford variety, and are curiosities in the stove, among other plants of similar growth.——The species are,

1. Xylophylla Longifolia; *Long-leaved Sea-side Laurel.* Leaves linear, alternately toothed; flowers solitary at each tooth. Trunk shrubby, almost as thick as a man's arm, dividing above into many round branches, as thick as the finger. The calix is red, resembling a small clove, bearing a roundish-oblong fruit like a Bay-berry; when opened, a small nucleus is found resembling a grain of rice, fixed on the stalk, and tasting sweet like a filbert.—Found only on the lofty, stony, cold mountains of the isle of Ceram.

2. Xylophylla Latifolia; *Broad-leaved Sea-side Laurel.* Leaves rhomboid, crenate; notches crowded, each bearing one or more stalked flowers. The stem is four or five feet high, with a round bushy head; leaves a foot long, alternate, stalked, alternately pinnate; leaflets twelve or more, nearly sessile, one and a half or two inches long, ovate-rhomboid, acute, hard and rigid, erect, striated, smooth, entire towards the base; flowers copious, small, green, on simple crimson stalks; those of the female flowers much the longest. This elegant and singular shrub flowers in a stove copiously in August and September.—Native of lime-stone rocks, near the sea-side, in the West Indies.

3. Xylophylla Arbuscula; *Lanceolate-leaved Sea-side Laurel.* Leaves pinnate, lanceolate, pointed, crenate; notches crowded, each bearing one or more stalked flowers. This is suspected to be the same as the last, though the leaves are narrower.—Native of the sloping sides of lofty mountains, in the southern parts of Jamaica.

4. Xylophylla Falcata; *Sickle-leaved Sea-side Laurel.* Leaves scattered, linear-lanceolate, somewhat falcate, distantly toothed. Stem five or six feet high, shrubby, with round branches; leaves not pinnate, with a flat stalk, as in the two last species, but scattered irregularly over the branches, each proceeding from a scaly bud, simple, five or six inches long, one third of an inch wide, rigid, striated, tapering at the end, entire towards the base, alternately toothed in the upper part; the teeth an inch or more asunder. Flowers nearly sessile, many together at each tooth, crimson, on short stalks, some male and some female, but fewer of the latter in each tuft.—Native of the Bahamas.

5. Xylophylla Angustifolia; *Narrow-leaved Sea-side Laurel.* Leaves pinnate, linear-lanceolate, rather distantly toothed, scarcely curved; flowers on short stalks, polygamous, one or more from each tooth; they are red, the males palest. Stem only two feet in height.—Native of rocky situations, in the western parts of Jamaica.

6. Xylophylla Linearis; *Linear Sea-side Laurel.* Leaves pinnate, linear, tapering, pliant, crenate; their common stalk bordered, scattered, depressed; flowers several from each notch, white, monœcious, on capillary stalks, four lines in length. Stem hardly a foot high, erect, with round branches. —Native of shady, stony banks of rivers in the western parts of Jamaica.

7. Xylophilla Montana; *Mountain Sea-side Laurel.* Leaves somewhat two-ranked, elliptic-lanceolate, coriaceous, deeply crenate, nearly sessile, either blunt or acute, obliquely striated, rigid, brownish-green, smooth, with deep many-flowered notches. Flowers monœcious, nearly sessile, many from each notch; the males eight or ten, pale red; females solitary among the males, deep purple. Branches round, two-edged at the extremity. This is a shrub, six feet high, easily distinguished from all the species, which it in other respects resembles, by the permanency and texture of the ultimate branches, which are often forked, nearly erect, with annular scars.—It occurs upon lime-stone rocks, in the western parts of Jamaica.

8. Xylophylla Ramiflora; *Siberian Sea-side-Laurel.* Leaves elliptical, stalked, scattered, thin, hardly an inch in length, blunt, crenate, or somewhat wavy; flowers axillary, six or eight together, with minute red stipules or bractes; segments of the calix five, concave, white, with a coloured margin; antheræ five, thick, obtuse, furrowed at the outside; styles three, thread-shaped, simple, the length of the stamina. Stem bushy, with many straight wand-like leafy branches, each a span long. This is a hardy shrub, flowering in July and August.—Native of the deserts of Siberia.

Xylopia; a genus of the class Polyandria, order Polygynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in from three to five deep, broad, ovate, coriaceous, rather acute, permanent segments. *Corolla:* petals six, sessile, linear-lanceolate, coriaceous, much longer than the calix; the three outermost largest. *Stamina:* filamenta none; antheræ numerous, oblong, quadrangular, abrupt, parallel, crowded, seated on the tumid nearly globose receptacle, in several rows. *Pistil:* germina several, on short stalks, compressed; styles tapering, crowded together; stigmas simple. *Pericarp:* capsules several, stalked, coriaceous, compressed, bluntly angular, of one cell and two valves, bursting at the top. *Seeds:* one or two, obovate, polished, tunicated at the base. Essential Character. *Calix:* lobed, coriaceous. *Petals:* six, the three outermost largest. *Capsules:* stalked, angular, compressed, of two valves. *Seeds:* one or two, tunicated.——The species are,

1. Xylopia Muricata; *Rough-fruited Bitter-wood.* Leaves ovate-lanceolate, pointed, clothed with close-pressed hairs beneath: branches zigzag, nearly smooth. A small tree, fifteen to twenty feet high; the branches towards the extremity slightly silky. The leaves are alternate, on short thick stalks, spreading, with a blunt or emarginate smooth point, two inches or more long, their margin entire, slightly revolute; their upper surface smooth and shining, reticulated with veins, under paler, more opaque, clothed with fine, scattered, close, silky hairs, after a while deciduous; midrib stout, rough with minute tubercles at the back. Flower-stalks copious, axillary, solitary, short, knotty, bearing from two to five flowers; calix three-lobed, scarcely downy; petals half an inch long, densely silky on both sides, the three innermost very narrow, triangular-awl-shaped; capsules nearly ovate, sometimes as many as fifteen, coriaceous, covered with little points, of one cell and two valves, containing one or two oval seeds, each with a cup-like tunic at the bottom; fruit muricated.—Native of Jamaica.

2. Xylopia Frutescens; *Shrubby Silky Bitter-wood.* Leaves lanceolate, pointed, glaucous and silky beneath; branches silky; stalks with few flowers; capsules smooth. The smoothness of the fruit, the silkiness of the branches, and the narrowness of the leaves, sufficiently distinguish the present plant. The fruit is about the size of a hazel-nut, aromatic and acrid, serving, when powdered, instead of pepper.—Found in Brazil; also in Cayenne and Guiana, bearing flowers and fruit in August.

3. Xylopia Salicifolia; *Willow-leaved Bitter-wood.* Leaves oblong, with a bluntish point, silky beneath; they are narrow, an inch and half or two inches long, three or four lines broad, on short stalks, single-ribbed, without veins smooth and green above, villous beneath, with close-pressed silky hairs of a rufous gray: capsules from five to seven, gibbous, slightly pointed, not bursting; seeds one or two; stalks short, single-flowered, with small bractes. It is a tree with blackish branches, marked with white dots.—Found near Espinal in South America.

4. Xylopia Ligustrifolia; *Privet-leaved Bitter-wood.* Leaves oblong, rather acute, smooth on both sides; they are an inch and half long, four lines broad, on very short stalks, single-ribbed, veinless, somewhat shining above, paler beneath: stalks short, with few flowers, and small bractes; calix small, three-cleft; three outer petals longest, spreading at the points; capsules corrugated, not bursting; seeds one or two.—Found at Buga, in South America.

5. Xylopia Glabra; *Smooth Bitter-wood.* Leaves ovate-oblong, pointed, quite smooth on both sides; stalks single-flowered, solitary, or in pairs; fruit smooth. Browne says that the wood, bark, and berries, have an agreeable bitter taste, not unlike that of the orange-seed, and would probably prove excellent medicines. Wild pigeons feed much upon the berries, and derive their delicate bitterish flavour from this food. The berries are agreeable to the palate, and grateful to the stomach. The bark and wood are agreeable while fresh, but that delicacy diminishes greatly after they are dried. The wood is good timber, but must not be exposed to the weather.—Found in the mountains at the back of Bull Bay in Jamaica, where it grew to a considerable size, being fifty or sixty feet high; also in Barbadoes.

6. Xylopia Nitida; *Shining-leaved Bitter-wood.* Leaves oblong-lanceolate, smooth, polished on the upper side; they are somewhat elliptical, two or three inches long, and nine or ten lines broad, green, veiny, pale, and rather silky, with minute close hairs beneath, the margin a little revolute. Stalks branched, many-flowered; clusters small, corymbose, of four or five flowers, whose stalks are embraced by little roundish bractes; calix nearly entire, coriaceous, brown, pitcher-shaped, scarcely divided; bud of the petals oblong, triangular, acute. This is a tree of a middling size, with straight, round, rugged branches.—Found on the Oyac mountains of Cayenne, sloping down to the sea.

7. Xylopia Acuminata; *Long-pointed Bitter-wood.* Leaves oblong-elliptical, very long-pointed, perfectly smooth; they are on very short footstalks, four to six inches long, two inches wide, remarkably pointed, revolute, rather coriaceous, a little shining above: capsules on long stalks, single-valved, with two seeds; they are ovate, nine or ten lines in length, pointed, each tapering down into a long stalk, imperfectly bivalve, smooth, and even: seeds obovate, black, fetid, convex at the outside, flat at the inner. Branches round, rugged, smooth.—Native of Cayenne.

8. Xylopia Prinoides; *Winter-berry Bitter-wood.* Leaves oblong-lanceolate, smooth, membranous, pointed, bluntish at the extremity; they are on short stalks, smooth on both

sides, three or four inches in length, and from twelve to fifteen lines broad, shining above, rather glaucous beneath: stalks single-flowered, axillary, very short, each bearing an extremely minute bracte; flowers solitary; calix deeply three-cleft; petals ovate, acute, scarcely two lines long, being the smallest of this genus; capsules with two valves, stalked; seeds two, flat at the inner side, convex at the outer. Branches wand-like, slightly rugged.—Native of Cayenne.

Xylosma; a genus of the class Diœcia, order Polyandria. —Generic Character. *Male.* *Calix:* perianth in four or five deep, roundish, minute, spreading segments. *Corolla:* petals none, nectary minute, annular, finely crenate, surrounding the stamina. *Stamina:* filamenta from twenty to fifty, capillary, twice the length of the calix; antheræ roundish, small. *Female,* on a distinct tree. *Calix:* as in the male. *Corolla:* petals none; nectary as in the male, surrounding the germen. *Pistil:* germen superior, roundish-ovate; style very short, cylindrical; stigma obtuse, flat, obscurely three-cleft. *Pericarp:* berry dry, oblong, imperfectly divided into two cells by a partition from the bottom. *Seeds:* two in each, triangular, convex at the back, flat at the sides. Essential Character. *Male.* *Calix:* in four or five deep segments. *Petals:* none. *Nectary:* annular, crenate. *Stamina:* from twenty to fifty. *Female.* *Calix* and *Nectary:* as in the male. *Style:* very short. *Stigma:* slightly three-cleft. *Berry:* dry, of two incomplete cells. *Seeds:* two to each cell.——The species are,

1. Xylosma Suaveolens; *Serrated Sweet Wood.* Leaves ovate, serrated. It appears to be uncertain whether this be the Red Sanders Wood of the South Sea islands, the scent of which resembles that of the East Indian Wood of the same name. The Red Sanders Wood Tree was kept as long as possible from the knowledge of the European voyagers. The inhabitants of the Society islands employ the wood of this species to give a fragrant scent to Cocoa-nut oil for anointing their hair.

2. Xylosma Orbiculatum; *Entire-leaved Sweet Wood.* Leaves roundish, entire.—Native of Savage Island.

Xylostroma; a genus of the class Cryptogamia, order Fungi. Essential Character. Expanded, coriaceous, two-sided, shapeless, concealed; surface smooth and even; seminal globules very minute, attached to internal fibres. ——The only species is,

1. Xylostroma Giganteum; *Oak Leather.* The inside is spongy or partly hollow, occupied with branching fibres, bearing numerous little ovate capsules or receptacles. The whole fungus is very durable, remaining for years unchanged. It is generally of an uniform buff or pale tan colour; though a whitish variety, more compact than the usual sort, and another, saffron-coloured, have been noticed. This singular production is found in the centre of the trunks of growing Oaks, spreading in the form of a piece of cloth or leather, with numerous ramifications, through some of the largest trees; but whether it be like the dry rot in wrought timber, the cause or the consequence of decay, is yet unascertained.

Xyris; a genus of the class Triandria, order Monogynia. —Generic Character. *Calix:* perianth inferior, of three concave chaffy leaves; the outermost hooded, deciduous; the two lateral ones keeled, compressed, curved, acute, converging, permanent. *Corolla:* petals three, large, spreading, flat, crenate, with narrow claws, as long as the calix; nectaries three, feathery, alternate with the petals, suspected to be barren stamina. *Stamina:* filamenta three, inserted into the claws of the petals, much shorter than the border, thread-shaped, erect; antheræ oblong, incumbent. *Pistil:* germen superior, obovate, three-lobed; style one, thread-shaped, rather longer than the claws of the petals, three-cleft at the summit; stigmas obtuse, entire, or jagged. *Pericarp:* capsule roundish, of one cell and three valves, with three more or less prominent receptacles, running down the middle of each valve. *Seed:* numerous, minute, roundish, or elliptic, acute. Essential Character. *Calix:* of three unequal leaves; the two lateral ones permanent. *Petals:* three, equal. *Nectaries:* three, feathery. *Capsule:* superior, of three valves, with central receptacles. *Seeds:* numerous. —This is a genus of perennial herbs, with fibrous roots.—— The species are,

1. Xyris Indica; *East Indian Xyris.* Stalk furrowed, with many angles; head ovate; leaves sometimes a foot long, equalling the flower-stalks, lax, acute, almost the breadth of the nail. The flower-stalks are several, rather more slender than a pigeon's quill, furnished with six or eight furrows, and twisted in the lower part; head rather smaller than a hazel-nut, with roundish scales, which are from twenty-five to thirty in each head, rounded, or nearly orbicular, convex, closely imbricated, obtuse, brown, but a little polished, divided lengthwise into three nearly equal spaces, the central space slightly hoary, the others smooth.—Native of the East Indies.

2. Xyris Pubescens; *Downy-sheathed Xyris.* Stalk striated, almost cylindrical, enveloped in a downy sheath; leaves greatly elongated, a foot or foot and half long, half an inch wide, entire, pointed, dilated at the base. Roots long, as thick as the finger, with soft, rather fleshy, nearly simple fibres, as thick as a raven's quill, and producing from the crown a great number of soft, flaccid, alternate, somewhat imbricated, very smooth leaves. Stalks straight and rather slender, twisted at the lower part, where they are each embraced by a cylindrical, striated, downy sheath, three or four inches long, terminating in a little short acute leaf. Heads of flowers oval, obtuse, the size of a large pea, formed of numerous imbricated, very close, unequal, whitish scales; the outer ones a little oval, nearly flat, scarcely pointed; the inner narrower, obtuse, rather concave.—Native of the West Indies.

3. Xyris Macrocephala; *Great-headed Xyris.* Stalk with one acute angle, taller than the foliage, round in the lower part, somewhat two-edged further up, with one convex and one acute side; head and scales ovate; the latter gray at the back; the former, when in fruit, twice as big as a hazel-nut, ovate, with obtuse scales. This differs from the other species in the breadth of its leaves, and the size of the head.—Native of Cayenne.

4. Xyris Platycaulis; *Broad-stalked Xyris.* Stalk compressed, dilated, striated, smooth, twisted below, with a lax, cloven, abrupt sheath at the base. The stalks are a foot high, and two or three lines broad; sheath at least three inches long, smooth, striated, rather lax, cloven lengthwise, obliquely truncated at the summit; heads globose, abrupt at the summit, hardly so large as a pea, with broad, obtuse, concave, shining, chestnut-coloured scales, the outer ones keeled towards their point.—Native of Madagascar.

5. Xyris Anceps; *Small-headed Two-edged Xyris.* Stalk two-edged, smooth, a foot or more in height, twisted, smooth, by no means striated; head nearly globose, scarcely so large as a pea, with roundish, convex, hardly emarginate scales; leaves rather rigid, narrow, but one-third or one-fourth of the height of the stalks.—Native of Madagascar, Malabar, and probably also of Guiana.

6. Xyris Complanata; *Flat-stalked Xyris.* Stalk compressed flat, dilated, nearly straight, cartilaginous and rough at the edges, four times as long as the sword-shaped, straight,

bordered, roughish leaves; spike oblong or cylindrical; scales orbicular, tumid.—Native of New Holland.

7. Xyris Scabra: *Rough Xyris.* Stalk two-edged, twisted, with rather acute and rough angles; leaves linear; roughish head ovate or oblong.—Native of New Holland.

8. Xyris Lævis; *Smooth Xyris.* Stalk two-edged, smooth, as well as the narrow linear leaves; head nearly ovate; scales imbricated every way; keels of the calix-leaves fringed.—Found in New Holland.

9. Xyris Americana; *Blue American Xyris.* Stalks two-edged in the upper part, round in the lower part, with two prominent lines running down it, a foot or more in height; head ovate-oblong, rather bigger than a pea; scales polished, emarginate, with a small callous intermediate point. The corolla is said to be blue; and the leaves grassy, narrow and acute, half the length of the stalk.—Native of moist pastures in Brazil.

10. Xyris Caroliniana; *Carolina Xyris.* Stalk two-edged; head ovate, acute, small. This species is extremely variable; but is said to be distinguished from the last in having more rigid leaves, and large acute heads; the leaves vary in length; and the flowers are yellow.—Native of Carolina; and found in low grassy fields, on a sandy soil, from New Jersey to Florida. It is perennial, and flowers from June to August.

11. Xyris Torta; *Twisted-leaved Xyris.* Leaves linear, spirally twisted, as well as the stalk, which is two-edged below, quadrangular at the upper part; they are from one to ten inches long, a line broad, acute, many-ribbed, roughish at the edges, perfectly grassy; the outermost degenerating into broad, short, chestnut-coloured, pointed, imbricated scales: stalks solitary, about two feet high, nearly round, though two-edged and striated at the bottom, as well as more twisted than the leaves, but the upper part least, more distinctly two-edged, having towards the top four, sometimes unequal, angles: head globose, the size of a large white currant, obtuse, of a shining chestnut colour: scales polished, rounded, somewhat emarginate, pointless, with a small silky disk; they are almost orbicular, convex, dilated and thin at the edges; two or three of the lowermost are smaller, flatter, and slightly keeled.—Found in North America.

12. Xyris Pusilla; *Dwarf Broad-leaved Xyris.* Stalk two-edged, smooth, like the short, sword-shaped, two-ranked, equitant leaves, from two to six inches high, of a pale green, a little zigzag and twisted, somewhat quadrangular, sheathed at the base, with one or two leaves, which, like those growing from the root, are about an inch long, and two or three lines broad, slightly incurved at the point, of a pale shining green colour, with several ribs, and, in a dry state, have a finely dotted or reticulated surface: head orbicular, compressed, of a few shining, somewhat keeled, and pointed scales, which are orbicular, convex, of a shining chestnut brown, pale at the edges; the two lowermost equal, destitute of flowers, which in an early state cover the whole head, and are furnished with a strong green pointed keel.—Found in the tropical part of New Holland.

13. Xyris Denticulata; *Tooth-leaved Xyris.* Stalk roundish, smooth, slender, striated or angular towards the top; leaves short, linear, awl-shaped, rough with minute marginal teeth, from one to two inches long, not a line broad, their fine reticulations seeming to form the teeth at the margin and keel: head globose, twice as large as in the preceding species, consisting of more numerous bright chestnut scales, withth in, pale, often jagged margins, and a small green keel or point, not extending beyond the scale; the scales orbicular, shining, keeled at the summit, the two lowermost barren. The root consists of very small fibres.—Found in the tropical part of New Holland.

14. Xyris Paludosa; *Bog Xyris.* Stalk roundish, smooth, angular at the top; leaves somewhat tubular, that of the stalk longer than the sheath; head nearly globular; scales orbicular, shining, imbricated every way.—Found in the tropical part of New Holland.

15. Xyris Capensis; *Cape Xyris.* Stalk solitary, thread-shaped, striated, smooth, a foot high; leaves linear, very short, few, radical, smooth, and many times shorter than the stalk; flowers yellow; stigmas three, tumid, revolute, whitish.—Native of the Cape.

16. Xyris Brevifolia; *Short-leaved American Xyris.* Stalk thread-shaped, a span high, round and slender; leaves awl-shaped, compressed, narrow, an inch and a half long; head globose, the size of a black pepper-corn; scales broadish-oblong, the outermost narrowest, keeled.—Native of boggy meadows in Lower Carolina and Georgia: perennial.

17. Xyris Pauciflora; *Few-flowered Xyris.* Stalk quadrangular, from one to six or eight inches high, erect, straight, slender, striated, roughish; leaves linear, rough with minute marginal teeth, erect, sometimes nearly as tall as the stalk, grassy, very narrow, taper-pointed, striated; head nearly globular, the size of a large pea; scales shining, orbicular, spreading at the point, with a short triangular keel, chestnut-coloured, with a membranous, dilated, shining margin, of a golden yellow, and each tipped with a green, triangular, projecting keel or point, originating from the brown disk, but not extending beyond the membranous margin, with which it is incorporated; the prominence of this point gives the head a squarrose appearance. The root is a small dense tuft of pale fibres.—Native of the East Indies, and the tropical part of New Holland.

18. Xyris Bracteata; *Bracteated Xyris.* Stalk triangular, a foot and a half high, slender and rushy, even, smooth to the touch, though the most acute angle is roughish; leaves linear, their margins, and the base of the keel, rough; head roundish, or rather ovate than perfectly globose, one-third of an inch long; scales with a hoary disk, and brown membranous margin, the lower ones oblong, empty, with a linear disk, which is elliptic, oblong, convex, not keeled, of a hoary or glaucous hue, finely dotted, not downy; their margin at each side about half as broad, membranous, of a shining brown, paler outwards; there are several more scales at the bottom of each head, which are destitute of flowers, shorter, much narrower, abrupt, oblong, not elliptical, with a peculiarly narrow disk, and have the appearance of bractes; corolla rather large, yellow, turning white in decay.—Native of Port Jackson, New South Wales.

19. Xyris Juncea; *Rushy Xyris.* Stalk roundish, slightly compressed, rather zigzag, smooth, as well as the awl-shaped leaves, only eight or ten inches high; head globose; scales ovate, undivided, imbricated every way, their disk of the same colour as the margin; stigmas many-cleft.—Found near Port Jackson, New South Wales.

20. Xyris Gracilis; *Slender Xyris.* Stalk thread-shaped, smooth, scarcely twisted, somewhat compressed, seldom above a foot high; head oval, consisting of few flowers, small, obovate; scales imbricated every way; their disk hoary; margin blackish. The disk resembles that of the eighteenth species, but the membranous margin of the scales is of a darker brown, and at the upper part of each quite black, as if burnt. Some of the lowest scales are smaller, linear-oblong, and of a more uniform brown; stigmas undivided, long.—Native of New Holland, and Van Diemen's island.

21. Xyris Filiformis; *Thread-shaped Xyris.* Stalk thread-

shaped, compressed, solitary, six or eght inches high, very slender; root small and fibrous; leaves linear-awl-shaped, compressed, two-ranked, four or five, seldom more, very narrow, tapering, but rather obtuse at the point; their surface minutely speckled, and more or less evidently reticulated or dotted; head and scales elliptical; disk and margin uniform, with slight traces of a keel. The head is about the size of hemp-seed, but more oblong, acute at each end, of a copper-brown, not very shining; the two lowermost scales empty, rather palest, most oblong, and strongly keeled, the rest elliptical, bluntly pointed, very smooth and even, without any limited disk, but sometimes marked with beautiful concentric veins; their keel scarcely discernible, except in the form of a short pale elevation near the apex, but not projecting into a point; corolla yellow, small.—Found in marshy sandy ground, at Sierra Leone.

22. Xyris Flexifolia; *Wavy-leaved Xyris.* Stalk thread-shaped, twisted, smooth, as well as the zigzag, slender, slightly compressed leaves, from six to twelve inches high; head oval, with few flowers; stigmas undivided.—Found on the southern coast of New Holland.

23. Xyris Teretifolia; *Cylindrical-leaved Xyris.* Stalk and leaves round, straight, and roughish, the former eighteen inches high; head ovate, many-flowered; scales imbricated every way, torn into many segments.—Found on the southern coast of New Holland.

24. Xyris Lacera; *Jagged-headed Xyris.* Stalk round, smooth; head nearly globular, many-flowered; scales imbricated every way, torn into many segments.—Native of New Holland, on the southern coast.

25. Xyris Subulata; *Awl-leaved Peruvian Xyris.* Stalk thread-shaped, roughish at the top; root perennial; leaves linear, awl-shaped, their sheaths woolly at the margin; head oblong, containing two or three yellow flowers. These plants grow close in patches.—Native of marshy cool mountainous parts of Peru, and flowering there in September.

26. Xyris Vivipara; *Viviparous Xyris.* Stalk somewhat compressed, roughish at the top, about a foot high, enveloped at the base with a striated, keeled, bluntish, smooth, rough-backed sheath, an inch and a half long; leaves linear-sword-shaped, their sheaths fringed, all radical, two-ranked, from two to four inches long, erect; head globular, at length leafy and viviparous, rather abrupt, the size of a pepper-corn; scales roundish-ovate, bluntish, brownish, coriaceous, smooth, rather transparent at the margin. After flowering, the centre of the head throws out a leafy crown, which becomes a young plant; but we are not informed whether this leafy tuft originates in the vegetation of one or two of the seeds, or in the germen being supplanted in the flower by a bud, or in a proliferous elongation of the stalk, wholly independent of the parts of fructification. Root fibrous, perennial.—Found on the banks of the Oronoko.

27. Xyris Operculata; *Imbricated Xyris.* Capsule partly three-celled; stalk round, or slightly angular, about eighteen inches high, quite smooth; leaves thread-shaped; head obovate, full half an inch long, with five rows of very numerous obovate scales, whose broad convex disk is of a bronze-like hue; the margin brown and narrow, more or less jagged, with a deciduous tooth-like fringe: the scales are beardless, imbricated, in five rows, with numerous empty ones, gradually smaller at the base; flowers large, of a bright yellow colour; stigmas obtuse,—Native of Port Jackson.

28. Xyris Lanata; *Woolly Xyris.* Stalk round, smooth; leaves linear, narrow; head nearly globular; scales woolly at the extremity, imbricated in five rows, with several empty ones, gradually smaller at the base..—Found in New Holland.

Xysmalobium; a genus of the class Pentandria, order Digynia.—Generic Character. *Calix:* perianth inferior, of one leaf, in five deep, lanceolate, acute, permanent segments. *Corolla:* of one petal, in five deep, ovate, spreading, rather oblique segments; crown of the stamina in a single row of ten deep segments, five of them fleshy, roundish, opposite to the antheræ, simple at the inner side, five intermediate ones smaller. *Stamina:* filamenta scarcely any; antheræ five, each tipped with an ovate bluntish membrane; masses of pollen ten, compressed, smooth, pendulous, with rather broad connecting processes. *Pistil:* germina two, ovate, pointed; styles very short; common stigma pointless. *Pericarp:* follicles two, inflated, clothed all over with numerous, long, slender, tapering, hairy, filamentous processes. *Seeds:* numerous, imbricated, crowned with silky down. Essential Character. Masses of pollen ten, smooth, pendulous. *Crown:* simple, in ten deep segments, the intermediate ones minute. *Corolla:* spreading. *Follicles:* shaggy.—This is a genus of upright shrubs, with opposite, and sometimes alternate leaves; umbels lateral, either axillary or between the footstalks; flowers rather large; and the border of the corolla sometimes bearded.——The species are,

1. Xysmalobium Undulatum; *Wave-leaved Xysmalobium.* Leaves undulated, naked. The thick, white, perennial root, early in the spring sends out two or three round, green, leafy stems; the leaves are alternate, sessile, three or four inches long, ovate-lanceolate, gradually tapering to a bluntish point, with a thick midrib, and numerous interbranching veins, nearly smooth on both sides, undulated and roughish at the margin; umbels axillary, stalked, much shorter than the leaves, with hairy stalks, and linear hairy bractes; flowers green, their segments densely bearded at the extremity, with white shaggy hairs; follicles covered with spreading hairy filamenta, an inch long. This is a green-house plant, flowering in July; and when wounded in any part, discharges a copious milky fluid.—Native of the Cape of Good Hope.

2. Xysmalobium Grandiflorum; *Large-flowered Xysmalobium.* Leaves stalked, hairy; stem simple, erect, hairy; flowers large, axillary, stalked; corolla smooth, speckled.—Native of the Cape of Good Hope.

YAR

YAM. See *Dioscorea.*

Yard Manure.—To prevent the vegetation of weeds in this manure, it should be turned up in the farm-yard in rows when it has become two feet deep, leaving sufficient room between each row, to admit the fresh dung from the stables, cow-houses, and sties. After the manure, thus thrown up, has attained a fair heat, turning it over again generally destroys, or at least arrests, the growth of weeds, and renders it fit to be laid upon the land. In Norfolk, the prevailing opinion is, that long dung is best for strong land, and short for light soils: but the general practice is, of spreading short in all cases. Many intelligent Essex farmers use long dung,

YAR

or yard-manure, with great advantage; though the general custom even there is to clamp and employ that which is in the short state. Some farmers dislike to see their yard-manure long in the heaps, on account of the loss in turning. It has been found by long and extensive experience, that in dunging for Wheat, long fresh dung is superior to any other, and the crop where it is applied always certain. A slight incipient fermentation is unquestionably useful in the heaps of this kind of manure, for by it the woody fibres are disposed to decay and dissolve when it is carried to the land, or ploughed into the soil. These woody fibres are also collected in great proportion among the yard dung; yet too great a degree of fermentation is very injurious to mixed yard-manure when heaped, and it is better that there should be no fermentation at all before the manure is used, than that it should be suffered to proceed too far, because too much fermentation dissipates or destroys the most useful part of the manure. During the violent fermentation which is necessary for reducing farm-yard manure to the state in which it is termed short muck or dung, not only a large quantity of fluid, but likewise of gaseous material, is lost, by which the weight of the manure is reduced by one half, and sometimes two-thirds, and the principal elastic matter disengaged, as carbonic acid, with some ammonia; both of which, if retained by the moisture in the soil, would supply the plants with effectual nourishment. The dissipation of gaseous matter, when pushed to the extreme, as in the case of short dung, has another disadvantage attending it, in the loss of heat, which if excited in the soil, is useful in promoting the germination of the seeds, and assists the plant in those stages when it is most liable to disease; and the fermentation of the manure in the soil is peculiarly favourable to the Wheat-crop, by preserving a genial temperature beneath the surface late in the autumn, and during winter. It is also a general principle in chemistry, that in all cases of decomposition, substances combine much more readily at the time of their disengagement than after they have been perfectly formed: and in fermentation beneath the soil, the fluid matter produced is applied instantly, even while it is warm, to the organs of the plant, and therefore is more likely to be efficient than short dung, which has passed through the process, and all the principles of which have entered into new combinations. The application of yard-manure in the long state, is highly advantageous with regard to the quantity and extent of the improvement which may be produced, as nearly four loads of it are generally required to form one of the short manure. But the main objection against slightly fermented yard-manure is, that weeds rise more luxuriantly and in greater numbers where it is had recourse to: though the seeds thus carried out will certainly sprout, it is but seldom that can occur to any extent; and if the land be foul, any kind of manure will accelerate the growth of the weeds. There is another question connected with this subject, which is not of less interest or importance to the farmer to have decided, which is, that of the superior advantage of consuming the straw of the farm by animals, or of having it trodden into manure with the dung in the yards. Some are against the former of these practices; though probably a majority approve it, and have also recourse to buying oil-cake, very often at a loss, in order that their straw may be trodden into dung or manure by fattening beasts, which nevertheless is excellent yard economy. See *Manure*.

Yarrow. See *Achillea*.

Yellow Rattle. See *Rhinanthus*.

Yellow Root. See *Hydrastis*.

Yellow Succory. See *Picris*.

Yellow Weed. See *Reseda*.

Yew Tree. See *Taxus*.

Yucca; a genus of the class Hexandria, order Monogynia.—Generic Character. *Calix:* none. *Corolla:* bell-shaped, in six deep, ovate, very large, equal, moderately spreading segments, connected by their claws; nectaries none. *Stamina:* filamenta six, inserted into the base of the corolla, very short, swelling upwards, reflexed; antheræ minute, roundish. *Pistil:* germen superior, oblong, bluntly triangular, with six furrows, rather longer than the stamina; style none; stigma obtuse, with three furrows, its lobes cloven, the centre pervious. *Pericarp:* berry oblong, bluntly hexagonal, fleshy, perforated at the summit, of six cells, three of the partitions thicker than the three intermediate ones. *Seeds:* very numerous, in a single row, separated from each other by transverse membranes, roundish-obovate, flat depressed, attached by their pointed base to the inner angle of the cell. Essential Character. *Corolla:* inferior, bell-shaped, its segments without nectaries. *Stamina:* club-shaped. *Style:* none. *Berry:* hexagonal, of six cells. *Seeds:* numerous, flat.—This is a handsome perennial genus, more or less caulescent, with numerous, long, simple, rigid, or coriaceous, pungent leaves; and copious panicled, white, liliaceous, very elegant, though generally inodorous flowers. Some of the species are tolerably hardy in our gardens, but do not blossom constantly, nor very readily.——The species are,

1. Yucca Gloriosa; *Common Adam's Needle.* Caulescent: leaves lanceolate, straight, furrowed, their edges smooth and entire. The stem in our gardens is seldom two feet in height, somewhat branched, thick, tough, crowned at the summit of each branch, if divided, with a profusion of crowded leaves spreading in every direction, each a foot and half or two feet long, tapering to a hard spinous point, contracted in the lower part, but dilated at the very base, where they half clasp the stem; their upper surface is of a fine green, smooth, furrowed longitudinally, especially towards the end; the under pale and more even; the edges quite even and smooth: panicle terminal, compound, erect, composed of perhaps an hundred drooping flowers, not much inferior in size and beauty to those of the White Water Lily, but more cream-coloured, tinged at the base and points with crimson, destitute of scent; partial stalks about an inch long, round, smooth, with a pair of membranous ibractes at the base; stigma in three distinct spreading lobes.—Native of Peru and North America: on the sea-shore of Carolina flowering in July and August, and there attaining the height of ten feet.—*Propagation and Culture.* The plants of this genus may all be raised by offsets or suckers, from the roots and heads of the old plants as well as by seed. The offsets and suckers may be taken off any time in spring or summer, being laid in some dry place for a few days till the wounded part caused by the separation is dried and healed over, when they may be planted out separately in pots of light sandy compost, and placed in a shady situation till they have taken root in a perfect manner; but they succeed better when assisted by a hot-bed. To raise them from seed, it should be procured from abroad, and sown in pots of light earth, plunging them into a hot-bed, where they will soon come up. As soon as they are two or three inches high, prick them out separately in small pots of light sandy mould, replunging them in the hot-bed to forward their growth, allowing them moderate waterings and fresh air daily, and gradually hardening them to the full air, so as to be set out in June to remain till October, when they should be removed into the green-house for the winter. It will be prudent to preserve a few of each sort

in pots. They are all very ornamental. This, and the next species, after they have been hardened in the dry borders where the soil is light, and where the situation is warm and sheltered, will make a fine appearance, as also will the others among potted plants in green-house collections.

2. Yucca Recurvifolia; *Drooping-leaved Adam's Needle.* Caulescent: leaves linear-lanceolate, furrowed, recurved and drooping, their edges at length somewhat filamentous; flowers of a greenish yellow, with a tinge of purple, having a strong smell, with something like a citron flavour. Stem about three feet high. The three inner segments of the corolla are somewhat of the broadest.—Native of the sandy shores of Georgia.

3. Yucca Aloifolia; *Aloe-leaved Adam's Needle.* Caulescent: leaves linear-lanceolate, even, straight, their edges bordered with fine callous notches. Stem generally simple, rising even in our green-house to the height of fifteen to eighteen feet; for the most part naked, round, three or four inches in diameter, scarred from fallen leaves. The upper part, for the space of a foot or more, is thickly beset with leaves, spreading in every direction; the lower ones pointing downwards, the upper ones nearly upwards, only a few in the centre being horizontal. The leaves are narrower, and stiffer than in the preceding species; they are straight, and distinguished by their crenate edges, as well as even surface. The panicle also is more dense and cylindrical, from two to three feet high. Flowers white, externally tinged with purple; stigma abrupt, of three shorter, less dilated, and spreading lobes. This species will thrive for many years with very little earth, in pots not more than a foot deep. It rarely flowers, and afterwards the head decays at the top, throwing out lateral shoots, and the plant becomes branched; but its elegant simplicity is destroyed, and no more flowers, at least in our gardens, are ever produced.—Native of South America. See the first species.

4. Yucca Draconis: *Drooping-leaved Adam's Needle.* Caulescent: leaves linear-lanceolate, even, reflexed, crenate; segments of the corolla spreading, somewhat recurved. Ciusius says, the Indians use the fibres of the leaves of this species, obtained by maceration and beating, as a fine kind of thread, like flax or silk; they also make strong cordage of it for tying the rafters of their huts together.—Native of South Carolina.

5. Yucca Filamentosa; *Thready Adam's Needle.* Stem none; leaves lanceolate, entire, coarsely filamentous at the edges; they are numerous, a foot long, spreading in the form of a rose from the crown of the root; their points spinous, but short; their surfaces both striated, a little glaucous, rough to the touch with minute harsh prickles; their edges beset with long recurved threads: flower-stalks solitary, erect, from four to five feet high, round, smooth, leafless, bearing several scattered, oblong, membranous, reddish-brown bractes, such as also accompany the partial stalks: panicle compound, lax, and spreading, of numerous large and handsome, pendulous, cream-coloured, bell-shaped flowers, their segments taper-pointed: filamenta rough or glandular, with very small antheræ: stigma with spreading, somewhat recurved, and cloven lobes, like the first species.—Found upon the shores of Virginia and Carolina.

6. Yucca Angustifolia; *Narrow-leaved Dwarf Adam's Needle.* Stem none; leaves linear, elongated, rigid, sparingly filamentous at the edges; fruit obovate-cylindrical. Perennial; flowering in July and August.—Found by Mr. Thomas Nuttall on the banks of the Missouri.

ZAC

ZACINTHA; a genus of the class Syngenesia, order Polygamia-Æqualis.—Generic Character. *Common Calix:* double; the outermost short, erect, of several lanceolate leaves, membranous at the edges; innermost larger, simple, furrowed, of eight permanent, linear, acute, converging leaves, at length swelling and very prominent at the base. *Corolla:* compound, imbricated, uniform; florets equal, perfect, of one petal, ligulate, linear, abrupt, with five teeth. *Stamina:* filamenta five, capillary, very short; antheræ united into a cylindrical tube. *Pistil:* germen ovate-oblong; style thread-shaped, the length of the stamina; stigma two, reflexed. *Pericarp:* none, except the interior calix, which becomes woody, closed, depressed, with a point, having eight rounded protuberant angles, each scale enfolding one of the marginal seeds. *Seeds:* solitary to each floret; the marginal ones ovate-oblong, incurved, compressed at the sides, gibbous at the back, tapering below, striated, longitudinally channelled, and villous in front; central ones oblong, slightly incurved, quadrangular, compressed at the back, striated, smooth; down sessile, somewhat feathery; receptacle naked. Essential Character. *Receptacle:* naked. *Seeds:* of the circumference, incurved; of the centre, straight. *Down:* very short, finely feathery. Outer *Calix:* membranous; inner, with eight protuberances.——The following is the only known species,

1. Zacintha Verrucosa; *Warty Zacintha.* Root annual. Stems somewhat leafy, round, smooth, branched and forked, spreading, from a span to eighteen inches high: leaves runcinate, smooth, the radical ones largest and most numerous; flowers yellow, small. The swelling part of the calix after flowering assumes a purple colour.—Native of Italy, Crete, Lemnos, Zante, and Mount Athos.

ZAM

Zamia; a genus of the class Dicœcia, order Polyandria.—Generic Character. *Male. Calix:* catkin ovate, tesselated scales horizontal, obtuse, thickened towards the end, permanent. *Corolla:* none. *Stamina:* filamenta none; antheræ numerous, sessile, crowded on the under side of each scale, especially towards the extremity, elliptical, smooth, of two valves and one cell, splitting lengthwise. *Female. Calix:* catkin ovate, tesselated; scales horizontal, obtuse, more or less peltate, permanent. *Corolla:* none. *Pistil:* germina two, oval, sessile, horizontal, inflexed, on the under side of each scale, near the extremity; style very short, rather conical; stigma obtuse, undivided, pervious. *Pericarp:* drupa roundish, somewhat angular, of one cell; nut hard, roundish, or elliptical, of one cell. *Observe.* This genus, which is not very distinct, is most nearly allied to *Cycas,* but differs essentially in the female part of the fructification being a catkin, the scales of which bear two germina underneath; instead of an assemblage of fronds or leafy receptacles, bearing an indeterminate number upon their margins. The herbage is perennial, generally without a stem; leaves abruptly pinnate, singularly hard, rigid, and often spinous, rarely lobed; catkins radical, stalks. Essential Character. *Male. Catkin:* tesselated; scales abrupt. *Antheræ:* oval, sessile at the under side of each scale. *Female. Catkin:* tessel-

ated; scales peltate. *Drupas:* two, at the under side of each scale. These plants may be raised from seeds, and by other means, in pots plunged in the bark-beds of hot-houses and stoves, where they must constantly be kept in light rich earth or mould, having the management of similar exotics. They form a pleasing variety in collections of tender plants. ——The species are,

1. Zamia Cycadifolia; *Sago-Palm-leaved Zamia.* Leaflets very numerous, two-ranked, linear, entire, with simple spinous points; common stalk semicylindrical, channelled, downy; leaflets, when full grown, from fifty to eighty in number, rigid, parallel, acute, pungent, each about three inches long, the lowermost gradually shortest, and rather more distant; catkin of the fruit elongated, somewhat cylindrical. The thick globular scaly head of the root, which is nearly a foot in diameter, bears numerous spreading pectinate leaves; the stalk of each is in its naked part two feet long, as thick as a swan's quill, all over downy, as is also its leafy portion, and the young leaflets themselves. The ripe fruit is ovate-oblong, about fifteen inches in length, and five in diameter, brown, each scale bearing two ovate, angular, orange-coloured drupes, about an inch long, their points directed towards the base of the scale; nut not much smaller, ovate, angular.—Native of the Cape of Good Hope.

2. Zamia Pungens; *Needle Zamia.* Leaflets awl-shaped, spreading, straight, rigid, pointed, entire, their outer margin rounded at the base; common stalk nearly cylindrical, unarmed. Leaflets very thick and coriaceous, much fewer than in the preceding species, mostly opposite, four or five inches long, and one broad, their under surface somewhat striated, their upper smooth and shining; margin quite entire; point simple, spinous, stout, and rigid.—Native of the Cape.

3. Zamia Tridentata; *Three-toothed Zamia.* Leaflets linear, obscurely furrowed, smooth, with three spinous teeth at the end; common stalk semicylindrical, channelled. Leaflets fourteen to sixteen pair, linear, tapering at the ends, with two lanceolate, pointed, terminal teeth, and a third situated a little lower at the outer edge; each leaflet two to two and a half inches long.—Native of the Cape.

4. Zamia Angustifolia; *Narrow-leaved Zamia.* Leaves linear, elongated, entire, obtuse, with two terminal callous points; common stalk semicylindrical. The root is hardly bigger than a large radish; its ovate crown enveloped in a few pointed very broad scales; leaves about a yard high, with slender stalks and leaflets, the latter drooping, a span long, and two lines broad; catkins three inches long, on stalks about the same length; the male ones most slender, and nearly cylindrical; fruit ovate, three inches long, of a thick, ovate, or elliptical figure, with a blunt point; drupes concealed, red.—Native of the Bahamas.

5. Zamia Tenuis; *Slender Zamia.* Leaflets linear, obtuse, somewhat revolute, tapering at the base, with one or two obsolete teeth near the extremity; common stalk triangular, smooth. This is an intermediate species between the preceding and following, agreeing with the fourth species in the form of its leaflets, but are broader, and their stalk triangular; and with the sixth, in its stalks, though the leaflets are narrower, and are not minutely serrated towards the point.—Native of the Bahama Islands.

6. Zamia Media; *Intermediate Zamia.* Leaflets linear-lanceolate, obtuse, flat, obscurely serrated towards the point; common stalk triangular, smooth. Leaflets from fourteen to twenty pair, five inches long, and one third or half an inch broad, flat, for the most part entire, except a few shallow distant serratures towards the extremity, bluntish, and without any spinous termination; female catkins on short thick stalks, ovate, with a blunt point; fruit oval, brown, rough, three inches long. Crown of the root as large as the fist; leaves two feet long, besides their naked stalk, which is half as much.—Native of the West Indies.

7. Zamia Debilis; *Lax-leaved Zamia.* Leaflets lanceolate, acute, pointless, serrated towards the point; common stalk triangular, smooth. The leaflets are five or six pair, half an inch broad, though only two and a half or three inches long, and are distinguished from all the foregoing by their conspicuous serratures, all, however, near the end, the greater part of the leaflet being entire; the upper side is smooth and shining, the under furrowed and striated. It flowers in the stove in July and August.—Native of the East Indies.

8. Zamia Integrifolia; *Dwarf Zamia.* Leaflets smooth, striated, lanceolate, rounded, obtuse, and finely serrated at the end, tapering at the base; common stalk smooth, somewhat quadrangular. The crown of the root is sometimes as thick as a man's arm, dividing below into several stout branches and fibres; leaves usually about eighteen inches, sometimes three feet long. The leaflets are from ten to twenty pair, opposite or alternate, each two and a half or three inches long, varying in breadth, from one quarter to three-fourths of an inch, entire, rather shining, strongly striated on both sides, with many parallel ribs, the extremity rounded and pointless, with a greater or less number of slight tooth-like serratures in proportion to its width; catkins on short stalks, ovate, clothed with dark brown pubescence; the males about two inches long; fruit three inches long, elliptical, pointed, downy; its scales finally widely separating, each of them peltate and angular, supported by a rather slender angular stalk, above an inch in length, and remaining long after the fruit has fallen. Each drupe is elliptical, about half an inch or more in length, with a small quantity of sweet orange-coloured pulp, and a large slightly-pointed nut.—Native of East Florida, and also of Hispaniola.

9. Zamia Muricata; *Prickly-stalked Zamia.* Leaflets oblong, pointed, smooth, striated, serrated from the middle to the extremity; common stalk spinous. The leaflets are about four pair in number, six inches long, tapering at the base, striated, and ribbed on both sides, sharply serrated in their upper half; footstalk channelled, armed with very short scattered blunt spines.—Found near Porto Cabello in South America.

10. Zamia Furfuracea; *Broad Rusty-leaved Zamia.* Leaflets elliptic-oblong, pointless, copiously serrated from the middle to the extremity, striated and hairy beneath; common stalk spinous. The crown of the root is often a foot in diameter, and the leaves are from one to two feet long, exclusive of their prickly stalks. The number of the leaflets is usually eight or nine pair, three of four inches long, and one or one and a quarter broad, very rigid and coriaceous, shining, and roughish to the touch on the upper side, more furrowed, and clothed with shaggy chaffy pubescence, which gives them a rusty or tawny hue, underneath. Their serratures or teeth are numerous, obtuse, very irregular; catkins ovate, hoary, and downy, about three inches long, on stalks about the same length.—Native of the West Indies.

11. Zamia Spiralis; *Spiral Zamia.* Leaflets numerous, linear, very smooth, somewhat curved, with a few spinous teeth at the extremity; catkins smooth, with pointed scales, those of the males wedge-shaped. The leaves are very smooth, of a fine green, a yard or more long, spreading, each composed of from thirty to forty pair of long narrow leaflets, tipped with from three to five spinous teeth; footstalks said to be somewhat spiral. The catkins are stalked, cylindrical, about five inches long, and two in diameter,

squarrose, smooth, not downy nor hairy; scales of the male ones obovate-wedge-shaped, an inch long, with a short, broad, sharp, ascending, polished point; their upper side smooth and naked, under nearly covered with an uninterrupted heart-shaped assemblage of crowded oval anthers, the size of Poppy-seed; scales of the female catkins stalked, gibbous, two-edged, and depressed, larger than the male ones, each tipped with an erect, sword-shaped, pungent, smooth point, an inch long, and, as the fruit ripens, extended to three inches, the gibbous fleshy part of the scale being then also much enlarged; germens two, ovate, sessile, close together, at the inner edge of this fleshy part of the scale, and directed horizontally inward; drupes roundish, gibbous, an inch or an inch and half in diameter, orange-coloured, with a rather thin pulp, and a large, ovate, hard nut, not bursting, the kernel of which, after keeping twenty-five years, remained as horny, semitransparent, and hard, as the shell. These nuts are about the size of small chestnuts, and the whole cone filled with them is about the size of a man's head. They were said to be eaten roasted by the natives of New South Wales, but did not agree with English stomachs.—Native of New South Wales.

12. Zamia Longifolia; *Tall-leaved Zamia.* Leaflets numerous, elliptic-lanceolate, pointless, entire, clothed with shaggy down; scales of the male catkins wedge-shaped, with abrupt quadrangular points. The crown of the root is scaly, smooth, and a foot in diameter; leaves slightly spreading, from five to seven feet high; their stalks are quadrangular, without spines; leaflets from forty to fifty or sixty pair, two-ranked, three or four inches long, and one broad, coriaceous, striated beneath, clothed with a cobweb-like down, easily rubbed off. —Native of southern Africa.

13. Zamia Lanuginosa; *Woolly-scaled Zamia.* Leaflets lanceolate, smooth, spinous-pointed, with a few unilateral spinous teeth; radical scales woolly. The root consists of numerous very thick tap-shaped radicles, its crown being as large as a man's head, and covered with imbricated deltoid pointed scales two or three inches broad, all clothed with soft dense hoary wool; leaves a yard high, or more, dark green, very smooth and shining, with unarmed, quadrangular stalks, and from twenty-five to thirty pair of linear-lanceolate leaflets.—Native of southern Africa.

14. Zamia Horrida; *Gray Thorny Zamia.* Leaflets lanceolate, glaucous, acute, spinous-pointed, with a few unilateral, lanceolate, spinous teeth; radical scales smooth. The leaves and their stalks are all over finely glaucous, which distinguishes the plant from the rest of its genus. The scaly crown of the root is as large as the preceding species, but the scales are not woolly. This is distinguished by the smooth crown of the root, and the glaucous colour of the herbage.—Native of southern Africa.

15. Zamia Cycadis; *Bread Tree Zamia.* Leaflets lanceolate, spinous-pointed, smooth, entire, tapering at the base; scales of the catkins abrupt, obtuse, pointless. The crown of the root is large, round, and imbricated with scales; leaves from a span to two feet long, of rather numerous and crowded leaflets, each two and a half inches in length, and about a quarter of an inch broad; common stalks smooth; catkins stalked, ovate; the male a span long, its scales somewhat triangular, very obtuse, rugged, smooth, flat on the upper sides, keeled underneath, and covered with anthers the size of Millet-seed: female catkin larger than the male, nearly a foot long, green, and smooth, its scales stalked, with a quadrangular, peltate, thick termination, lodging a pair of ovate angular drupes with a red pulp; nut in each the size of an acorn, not very hard, with a white solid kernel. Thunberg informs us, that the older plants which have acquired a stem, are broken off or cut down by the Caffres and Hottentots; and the pith, which is of considerable thickness, being tied up in the skin of a sheep or calf, previously well rubbed with grease, is buried in the ground. After remaining there a month or longer, it is taken up in a putrifying state, and being bruised between two stones, and moistened with water, forms a sort of paste, which is made into little round cakes about an inch in thickness: these are baked in wood-ashes, and are esteemed a great luxury.—Native of the north-east part of southern Africa, growing on the sides of hills on dry open spots, especially where the ground has been cleared by burning.

Zannichellia; a genus of the class Monœcia, order Monandria.—Generic Character. *Male. Calix:* none. *Corolla:* none. *Stamina:* filamentum one, simple, elongated, erect; anther ovate-oblong, erect. *Female,* close to the male. *Calix:* perianth of one leaf, inferior, hollow, swelling, oblique, with two or three teeth. *Corolla:* none. *Pistil:* germina from four to eight, stalked, oblong, converging; styles as many, simple, rather spreading; stigmas ovate, peltate, flat, spreading outwards. *Pericarp:* none. *Seeds:* as many as the germina, naked, stalked, oblong, compressed, a little incurved, beaked with the permanent styles, tuberculated at the back, with a simple coriaceous coat. Essential Character. *Male. Calix:* none. *Corolla:* none. *Filamentum:* elongated, erect. *Anther:* oblong. *Female. Calix:* of one leaf. *Corolla:* none. *Germina:* four or more. *Stigmas:* peltate. *Seeds:* stalked, naked.——The species are,

1. Zannichellia Palustris; *Marsh Horned-Pondweed.* Anther of four cells, tawny; stigmas entire. Root annual; stem slender, floating, branched, round, leafy, and smooth, with the habit of a *Potamogeton*; leaves linear, grassy, sessile, narrow, acute, and entire, two or three inches long; bractea membranous, tubular, axillary, including a pair of green flowers, one male, the other female; seeds blackish when ripe, rugged or toothed at the back.—Native of ponds, ditches, and rivulets, all over Europe, and said also to be found near the sweet springs in Virginia.

2. Zannichellia Dentata; *Toothed Horned-Pondweed.* Anther of two cells; stigmas toothed. This is rather smaller than the preceding species, but differs most essentially in having only two cells to the anther, and remarkably toothed stigmas. The seeds also are tuberculated all over, not merely toothed at the back or keel.—Found with the first species, in the neighbourhood of Florence, as well as in the mountain-pools of the adjacent country.

Zanonia; a genus of the class Diœcia, order Pentandria. —Generic Character. *Male. Calix:* perianth of three ovate spreading leaves, shorter than the corolla. *Corolla:* of one petal, in five deep, spreading, pointed, inflexed, equal segments. *Stamina:* filamenta five, spreading, the length of the calix; antheræ simple. *Female,* on a separate plant. *Calix:* perianth as in the male, seated on the germen, deciduous. *Corolla:* as in the male. *Pistil:* germen oblong-club-shaped, inferior; styles three, spreading, conical, reflexed, permanent; stigmas divided, crisped. *Pericarp:* berry large, elongated, abrupt, tapering at the base, encompassed near the top with a crisped suture, of three cells. *Seeds:* two in each cell, rounded-oblong, flat, in the centre of a lanceolate scale or wing. Essential Character. *Male. Calix:* of three leaves. *Corolla:* in five deep segments. *Female. Calix:* superior, of three leaves. *Corolla:* in five deep segments. *Styles:* three. *Berry:* of three cells, with a lid. *Seeds:* winged, two in each cell.——The only species known is,

1. Zanonia Indica; *Climbing Indian Cucumber.* Leaves

alternate, stalked, ovate-oblong, acute, entire, smooth; flowers in lax drooping clusters, which in the male appear to be somewhat compound. The herbaceous branching stem appears to climb by means of simple spiral axillary tendrils; fruit oblong, abrupt, obscurely triangular.—Native of Malabar and Ceylon.

Zea; a genus of the class Monœcia, order Triandria.—Generic Character. *Male Flowers*, disposed in distinct lax spikes. *Calix*: glume two-flowered, of two ovate-oblong, swelling, pointed, beardless valves, the outermost rather longest. *Corolla*: glume of two, oblong, beardless valves, about the length of the calix, the outermost swelling, obtuse, the innermost terminating in two teeth; nectary of two very short fleshy scales, dilated upwards, abrupt, furrowed at the summit. *Stamina*: filamenta three, capillary; antheræ somewhat prismatic, cloven, bursting at the top. *Female Flowers*, in a very dense spike, below the male, on the same plant, concealed by the leaves. *Calix*: glume single-flowered, of two permanent roundish thick valves, membranous and fringed at the margin, the outer one thickest. *Corolla*: glume of four unequal, membranous, transparent, broad, short, permanent valves. *Pistil*: germen very small; style thread-shaped, extremely long, pendulous; stigma simple, downy towards the summit. *Pericarp*: none. *Common Receptacle*: very large and long, with five or more angles, and as many rows of cells, transversely excavated, in each of which are imbedded the fruits of two flowers, surrounded with their own calix and corolla. *Seed*: solitary, roundish, stalked, longer than the glumes, angular and compressed at the base. *Observe*. Two out of the four valves of the female corolla appear to belong to an abortive flower. Essential Character. *Male Flowers*, in distinct spikes. *Calix*: a two-flowered beardless glume. *Corolla*: beardless. *Female*. *Calix*: a glume of two valves. *Corolla*: of four valves. *Style*: one, thread-shaped, pendulous. *Seeds*: solitary, imbedded in an oblong receptacle.——The species are,

1. Zea Mays; *Common Maize*, or *Indian Corn*. Leaves entire; they are sheathing, lanceolate, concave, acute, ribbed, two or three feet long, and three or four inches broad: root annual, consisting of innumerable fibres; stem erect, somewhat branched, round, stout, jointed, leafy, from five to ten feet high; male flowers in numerous aggregate terminal spikes, each three or four inches long, grayish, downy, with purple antheræ; female ones below, in a generally simple cylindrical spike, covered by the large sheaths of the upper leaves; styles six or eight inches long, very numerous, of a shining yellowish or reddish hue, hanging down like a long silken tassel; seeds white, yellow, red, or purplish, forming a heavy tesselated cone-like naked spike, from six to ten inches long. There are innumerable varieties, in the size, figure, colour, and qualities of the grain, which, though valuable for many purposes, and yielding an abundant crop, is far inferior to Wheat as bread-corn. Pursh mentions a variety recently imported from a place on the Missouri, which promises to be particularly valuable, as ripening earlier than any other sort, and yielding an excellent produce.—Indian Corn is given to horses, cattle, and hogs, without shelling, and only husked in the ear; but when given to fowls, or offered for sale, it is rubbed off by burning a cob in the fire till hard, and then rubbing the corn therewith. It is sometimes given to pigs, but oftener, ground, to fowls; and is the most nutritious grain, except Wheat, either for human sustenance, or provender for brute animals.—*Propagation and Culture*. Maize is cultivated in gardens and pleasure-grounds for the sake of its singular tall growth. It may be raised by sowing the seed in the spring, in a dry warm situation, where the plants are intended to remain, in patches of two or three seeds or more in each, about an inch and half deep: when they come up, they should be thinned out to one or two of the strongest. But to have the plants more forward, so as to produce ripe seed-spikes more effectually, some should be sown in a hot-bed at the same time, and when the plants are three or four inches high, be forwarded by pricking them out upon another hot-bed, either under a deep frame or an awning of hoop arches, to be covered with mats occasionally, allowing them plenty of free air; and in May, if they have acquired sufficient growth, they should be transplanted with balls of earth about their roots into the full ground in the borders or shrubbery clumps, in warm sunny situations, being well watered; and when the summer proves warm and dry they often produce perfect heads, and ripen seed well. It is necessary to prop their tall stalks with stakes, whenever they are much exposed to wind and rain. A late writer, (who planted a small quantity of this sort of grain in his garden, which turned out superior to his expectation,) is of opinion, that this crop may be raised to advantage in the field, on some light soils, particularly the poor sands of Norfolk and Suffolk, or on any hot burning lands, because the countries where it grows naturally are light hot soils. He advises the drill method of cultivating it, as the small hillocks in planting the seeds separately, make the land unsightly, and improper for other crops. But to raise the greatest produce in corn, he conceives, the hills are the best way; but when the crop is intended for fodder, then drills are to be preferred. The seed is to be covered an inch deep; when the corn first appears above the surface, the drills must be examined, to see whether it all comes up properly; and if it has not, there must be fresh seeds put into the vacant places, to prevent a loss in the crop. As soon as these fresh plants have taken root in the ground, the crop should be examined again to see whether any have died away, or the birds have taken the seed. The plants must also be thinned to two on a hill, and strong ones substituted for the weak. In the cultivation, while growing in the hill way, the hoe must be often used, and earth frequently given to them, as the land cannot be made too light for this sort of produce: but when it is in drills, hoe it like garden peas. When the corn gets out of the milk, the blades below must be all pulled off while green; tie them up in small bunches about the size of a birch-broom, and hang them on the top of the stalks of the corn; for at the same time that the blades are pulled, the tops must be cut off, and set up in round bunches to dry, and tied round the topmost part to keep them from falling; and they must be harvested as soon as they are dried. The blades are generally ready in four or five days, but the tops take longer: when these blades and tops are properly harvested, they are excellent food; and as this crop will be thus matured, and cleared off, by the end of August, the land might afterwards be ploughed and sown with Rye. The writer, already quoted, is of opinion, that if seeds were required, it would be very proper to sow them at that time on this poor hot land; as the warm season being over, they would have sufficient time to take root before winter. If only Rye were wanted, it might be eaten with sheep in the spring, or during the winter: but the stalks must stand for the corn to ripen after the rye is sown; and the corn ought to hang on the stalk till it is hard. In America, it is often December before the white corn can be pulled, or September for the yellow corn: if it is pulled before it is hard, and the cob is not perfectly dry, it will mould and spoil, and the corn will be apt to rot; hence care should be taken not to pull it too soon.

Zea. See *Triticum Spelta.*

Zedoary. See *Kæmpferia Rotunda.*

Zerumbet. See *Amomum.*

Zeugites; a genus of the class Triandria, order Digynia. —Generic Character. *Common Calix:* a glume of two valves; the outer one broadest, concave, abrupt, and jagged, ribbed; membranous at the edges; the inner narrower, sharper, and keeled. *Male Florets:* two, smallest, on a common stalk, the length of the solitary female florets, within the common calix. *Perianth:* none. *Corolla:* glume of two ovate-oblong, compressed, bluntish, awnless, equal valves. *Stamina:* filamenta three, capillary, the length of the corolla; antheræ oblong, cloven at each end. *Female,* within the larger glume of the common calix, sessile. *Perianth:* none. *Corolla:* glume of one oblong concave valve, twice the size of the calix, bordered towards the top with a dilated membrane, awned; the awn terminal, capillary, straight, half as long again as the glume. *Pistil:* germen oblong; style divided; stigmas long, shaggy. *Pericarp:* none. *Seed:* solitary, oblong. Essential Character. *Common Calix:* of two valves, with three flowers; the female one sessile; the males stalked. *Corolla:* of the males, of two beardless valves; of the female, of one awned valve. *Style:* divided. *Seed:* oblong.——The only known species is,

1. Zeugites Americanus; *Jamaica Yoke Grass.* Root perennial; stem two feet high, much branched, ascending, round, jointed, polished, brownish, leafy, rather slender; leaves alternate, on slender stalks, each with a long sheathing base, reclinate, or nearly pendulous, ovate, acute, entire, smooth, many-ribbed, from an inch to an inch and a half long, and from half an inch to an inch broad; panicles terminal, from the sheaths of the uppermost leaves, compound, spreading, with smooth slender branches; glumes green, striated, smooth. —Native of Jamaica, in a rich soil, and a shady situation.

Zieria; a genus of the class Tetrandria, order Monogynia. —Generic Character. *Calix:* perianth inferior, of one leaf, in four deep, ovate, rather acute, equal, permanent segments. *Corolla:* petals four, ovate, pointed, somewhat coriaceous, downy, equal, longer than the calix, alternate with its segments. *Stamina:* filamenta four, alternate with the petals, awl-shaped, simple, smooth, inflexed, much shorter than the corolla, each inserted into a globular gland, projecting above their base at the inside; antheræ terminal, roundish, with a minute point. *Pistil:* germen superior, roundish, four-lobed; style terminal, erect, columnar, the length of the stamens, deciduous; stigmas capitate, four-lobed. *Pericarp:* capsules four, connected at their inner edge, each compressed, abrupt, of two valves and one cell. *Seeds:* solitary, oval, compressed, each enclosed in a horny elastic tunic of two valves. *Observe.* This genus is essentially characterized by the insertion of each of its stamina into the outside of one of four large glands, standing on the receptacle, at the base of the germen, as well as by the simplicity of those stamina, in the other parts of their structure. All the species abound with resinous dots on their leaves, stalks, and calix, lodging an essential oil, the qualities of which are more or less acrid and aromatic. Essential Character. *Calix:* in four deep segments. *Petals:* four. *Stamina:* smooth, each inserted into a gland. *Style:* simple. *Stigma:* four-lobed. *Capsules:* four, combined. *Seeds:* with an elastic tunic.——The species are,

1. Zieria Lanceolata; *Lanceolate Zieria.* Clusters axillary, repeatedly three-forked; leaflets lanceolate, flat, acute; branches and stalks warty. The stem is bushy, of humble growth, three feet high, with round, purple, leafy branches; footstalks channelled, nearly an inch long, destitute of stipules, each bearing three lanceolate, flat, entire, smooth, single-ribbed leaflets, contracted at each end, the middle one rather the largest, being two inches, or two and a half in length; panicles opposite, axillary, often two together, somewhat leafy, repeatedly forked, many-flowered, various in length, spreading, slightly downy, their stalks quadrangular, purplish; flowers white, each about the size of a privet blossom, with yellow antheræ; capsules brown, dotted with glands.—Native of Port Jackson, New South Wales.

2. Zieria Lævigata; *Smooth Zieria.* Clusters axillary, three-forked, corymbose; leaflets linear, revolute; branches and stalks very smooth. The leaves are smaller than in the foregoing species, with a somewhat glaucous hue; flowers rather larger, much fewer, the panicles being always solitary, less compound, and situated chiefly towards the upper part of each branch; stalks acutely quadrangular, and very smooth; calix brown or reddish, taper-pointed, quite smooth; petals downy on both sides, like a piece of woollen cloth. This is a handsome plant.—Found near Port Jackson.

3. Zieria Pauciflora; *Few-flowered Zieria.* Stalks axillary, with one or three flowers; leaflets linear, obovate, somewhat revolute; branches and stalks hairy; segments of the calix lanceolate, taper-pointed. A small shrub, with small, round, scarcely quadrangular branches, more or less clothed with erect bristly hairs; the leaves are about half the size of the last species, with their leaflets dilated upwards, and obtuse, a little crenate towards the end, copiously dotted, rarely hairy, on the upper side, sometimes very hairy beneath, but occasionally quite smooth; the flowers are very small, often quite solitary, on an axillary stalk, sometimes there are three flowers on each stalk; segments of the calix broad at the base, but tapering suddenly into a long point; petals minutely dotted with tufts of starry hairs, giving them a warty or granulated aspect; capsules tuberculated, curiously reticulated on the inside; seeds black, rather opaque, with a shining, white, at length convoluted, tunic, whose edge is minutely fringed.—Native of New South Wales.

4. Zieria Cytisoides; *Downy Zieria.* Stalks axillary, three-forked, leafy; leaflets obovate, entire, downy on both sides; branches and stalks downy. Branches round; footstalks half an inch long; calix very downy, its segments broad and ovate; petals about twice as long, and of the same shape, downy.—Native of New South Wales.

Zingiber; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* perianth superior, of one leaf, tubular, sheathing, membranous, splitting at one side. *Corolla:* of one petal; tube twice the length of the calix, a little swelling upwards; outer border ringent, the upper lip undivided; lower in two deep, equal, deflexed segments; inner border a large spreading three-lobed lip, of which the middle segment is the largest, all of them more or less wavy and crenate. *Stamina:* filamenta one, erect, oblong, extended beyond the anther in an awl-shaped incurved beak, involute at the edges, embracing the style; anther attached by its beak, below the beak of the filament, oblong, of two close, parallel, linear lobes, meeting round the style, bursting in front. *Pistil:* germen inferiór, roundish, small, crowned with a pair of glands; style thread-shaped, embraced by the filament, and scarcely extending beyond its beak; stigma small, concave, fringed, projecting a little beyond the point of the beak. *Pericarp:* capsule (uncertain.) Essential Character. *Anther:* two-lobed. *Filament:* elongated beyond the anther, with an awl-shaped, channelled beak, embracing the style. Outer border of the *corolla* ringent; inner a three-lobed lip.——The species are,

1. Zingiber Officinale; *Narrow-leaved Ginger.* Bractes ovate, acute; segments of the outer border of the corolla linear,

revolute; middle lobe of the lip entire. Root perennial, tuberous, fleshy, with long stout fibres, well known for its hot gratefully aromatic flavour, and cordial qualities. The whole herb is smooth, and partakes of the flavour of the root; barren stems several, erect, herbaceous, wand-like, leafy, about three feet high; leaves alternate, linear-lanceolate, acute, entire, single-ribbed, spreading, with long, close, sheathing, upright footstalks; flower-stalks radical, a foot high, clothed with tubular sheathing bractes; spikes solitary, erect, club-shaped, enveloped in broader, shorter, less pointed, crowded bractes, each accompanied by a solitary sessile flower, twice its own length, of a delicate texture and short duration; the outer border of the corolla is of a very pale yellow or straw colour, revolute; the upper segment rather the broadest; lip, as well as the incurved point of the filament, spotted with crimson.—Native of the East Indies: it is grown in the West Indies. See also *Amomum* and *Costus*.

2. Zingiber Zerumbet; *Broad-leaved Ginger*. Bractes ovate, obtuse; segments of the outer border of the corolla straight; middle lobe of the lip cloven, slightly wavy; ribs and sheaths of the leaves smooth. This species is frequent in our stoves, where it often flowers at the end of autumn; and many persons who grow it think themselves possessed of the real Ginger. In fact, the habits of the two plants are very similar, but the barren stems of this species are rather the tallest, being four or five feet high, with elliptic-lanceolate leaves, silky beneath when young; flower-stalks eighteen inches or two feet high, thick, and firm; spike ovate; flowers pale yellow, inodurous, only lasting a few hours. The roots are said to be bitter, without the flavour and pungency of the true Ginger.—Native of the East Indies.

3. Zingiber Casumunar; *Casumunar*, or *Hairy Ginger*. Bractes ovate, rather acute; segments of the outer border of the corolla straight; middle lobe of the lip cloven, dilated, crisped, and crenate; rib and sheaths of the leaves hairy. The roots were anciently used as a powerful stimulant and tonic, in hysteric, paralytic, and other nervous disorders, possessing a warm bitterish flavour, with the smell of Ginger; but they have long been ejected from the Materia Medica: their shape is less elongated and compressed than that of Ginger, and more annulated, tuberous, or knotty; herbage most like the last species, but distinguished by the hairy sheath and midrib of the leaves; flower-stalks not above six or eight inches high; spike ovate, brownish; corolla pale yellow.—Native of the East Indies. This species may be propagated by cuttings of its root.

4. Zingiber Mioga; *Japanese Ginger*. Bractes ovate, acute; spikes nearly sessile; segments of the outer border of the corolla erect, acute; middle lobe of the lip concave, entire. The leafy stems are one to three feet high, and with the foliage resemble that of the preceding species; the flower-stalk is radical, remarkably short, or scarcely any; spike ovate, with numerous large, white, pointed, striated, concave bractes, the outer ones largest, concealing many within. The flowers smell faintly like Butterburr, and have a yellow, very concave, undivided lip, and a white border. Filamentum greenish-white, beaked, embracing the style.—Found in Japan, flowering in September.

5. Zingiber Roseum; *Rose-coloured Ginger*. Bractes lanceolate, coloured; spike nearly sessile; segments of the outer border of the corolla revolute; middle lobe of the lip flat, entire. Root creeping, cylindrical, branched, not knotty; leafy stems two to three feet high; spikes nearly sessile at the root, ovate, two or three inches long. The Telingas call this plant *Bumacatchicay*.—Native of the moist valleys of Hindoostan; flowering in the rainy season.

6. Zingiber Purpureum; *Purple Ginger*. Bractes ovate, coloured; segments of the outer border of the corolla erect; middle lobe of the lip undivided.—Native of the East Indies, flowering in September.

Zinnia; a genus of the class Syngenesia, order Polygamia-Superflua.—Generic Character. *Common Calix:* ovate-cylindrical, smooth, imbricated with numerous, obtuse, erect, permanent scales. *Corolla:* compound, radiated; florets of the elevated disk several, all perfect, funnel-shaped, five-cleft, internally villous; those of the radius from five to ten, ligulate, roundish or oblong, abrupt, larger than the disk, permanent. *Stamina:* in the perfect florets; filamenta five, very short; antheræ united into a cylindrical tube. *Pistil:* in the perfect florets; germen oblong, with two very unequal awns; style thread-shaped, cloven half way down; stigmas two, erect, obtuse: in the female florets, germen oblong, triangular, without awns; style capillary, cloven half way down; stigmas two, recurved. *Pericarp:* none, except the unchanged calix. *Seeds:* in the perfect florets solitary, oblong, quadrangular, compressed: down of two points, one of them awned; in the female florets solitary, pointless, crowned with the permanent petal. *Receptacle:* chaffy, with tongue-shaped, channelled, deciduous scales, the length of the calix. Essential Character. *Receptacle:* chaffy. *Seed-down:* of two erect, unequal awns. *Calix:* imbricated, somewhat ovate. *Florets* of the radius: from five to ten, permanent, undivided.—The species are,

1. Zinnia Pauciflora; *Yellow Zinnia*. Flowers sessile; leaves somewhat heart-shaped, sessile, clasping the stem. Root annual; stem erect, three or four feet high, branched, angular, leafy; leaves opposite, two or three inches long; flowers solitary at the ends of the branches, nearly or quite sessile, with the uppermost pair of leaves close to the base of the calix; disk brownish; radius yellow. This is not so handsome as the following species.—Native of Peru.—This, and the next, are cultivated by sowing their seeds upon a slight hot-bed in March, and when the plants are a few inches high they should be pricked out on another bed, previously prepared to receive them, where they should remain till the advance of summer, when they may be taken up and planted out in the borders of the pleasure-ground, where they blow and complete their seeds for the year following. Their leaves and flowers produce a fine effect.

2. Zinnia Multiflora; *Common Red Zinnia*. Flowers stalked; leaves opposite, ovate-lanceolate. This has a more hairy stem, with narrower and more elongated leaves than the preceding species. The rays are yellow, orange, and sometimes brick-red; the last colour is most common in Europe. The flowers stand each on a hollow, deeply-furrowed, terminal stalk, from one to two inches long, much thicker than the stem, and gradually swelling upwards; the disk is conical and acute, composed of reddish or tawny florets, accompanied by the prominent dark green or blackish scales of the receptacle; the radius consists of ten or more broad, elliptical, usually emarginate florets, of a deep brick-red, and very smooth above, pale greenish and rough beneath, reticulated with veins, and finally becoming rigid or membranous.—Native of North America: found on the banks of the Mississippi; flowering in July and August.

3. Zinnia Verticillata; *Whorl-leaved Zinnia*. Flowers stalked; leaves whorled, ovate-lanceolate; radiant florets very numerous. This is suspected to be a mere variety of the last. Cultivation, it is supposed, renders the flowers so very splendid, by their multiplied radius of a deep scarlet, and the broader, and less conical or pointed disk, than in the foregoing species.—Native of Mexico.

4. Zinnia Elegans; *Purple-flowered Zinnia.* Flowers stalked; leaves opposite, ovate-heart-shaped, sessile, clasping the stem, harsh on both sides; scales of the receptacle jagged and fringed; tubular florets with a hairy disk. The herbage of this species is stouter, the leaves broader and harsher to the touch, than in any other of the genus. The flowers, in a cultivated state, at least are as large as in the preceding species, with a conical, but rather obtuse disk; the prominent orange-coloured scales of the receptacle have many finely-fringed segments; the upper surface of the yellow tubular florets is densely shaggy; the radius consists of numerous, spreading, obovate florets, of a deep lilac or light purple colour, less harsh or scariose after flowering than in the second species. It is a tender annual, flowering from Midsummer to the end of autumn.—Native of Mexico.

5. Zinnia Tenuiflora; *Slender-flowered Zinnia.* Flowers stalked; leaves opposite, ovate-lanceolate, pointed; calix cylindrical; radiant florets linear, revolute. Leaves narrower, and nearly as smooth, as in the preceding species; the flowers are the smallest of their genus, and distinguished by their bright red, narrow, revolute radiant florets, very rough at the edges; the tubular florets are yellow, and roughish in the disk.—Native of Mexico. This is a very distinct species, but requires the same treatment as the rest. They may all perhaps succeed in favourable seasons, as hardy annuals, but are better raised with artificial heat in the spring.

Zizania; a genus of the class Monœcia, order Hexandria.—Generic Character. *Male. Calix:* none. *Corolla:* glume of two lanceolate, membranous, ribbed, clasping valves, one rather larger than the other, and most pointed; nectary of two ovate obtuse scales. *Stamina:* filamenta six, capillary, very short, equal; antheræ pendulous, linear, notched at each end, shorter than the corolla. *Female*, in the same panicle, larger. *Calix:* none. *Corolla:* glume of two valves, closed, except a vacancy at each side just above the base; the outer valve largest, concave, long, straight, rigid, revolute at the edges, embracing the inner at each side, and terminating in a long straight awn; the inner narrower, lanceolate, involute at the edges; nectary of two acute scales. *Stamina:* sometimes present, though minute and imperfect, with small incomplete antheræ. *Pistil:* germen superior, oblong; styles two, spreading, capillary, short; stigmas feathery, projecting between the valves of the corolla. *Seed:* solitary, oblong, even, polished, naked, unconnected with the glumes. Essential Character. *Male. Calix:* none. *Corolla:* of two valves, the outer one pointed. *Female. Calix:* none. *Corolla:* of two unequal closed valves, the outermost largest, revolute at the edges, with a terminal awn. *Styles:* two, divaricated. *Seed:* solitary, enclosed in the plaited corolla, but unconnected with it.——The species are,

1. Zizania Aquatica; *Canadian Wild Rice*, or *Tuscarora.* Panicle pyramidal, compound, with numerous male flowers in the lower part, spiked and female above. Root annual, consisting of long stout hairy fibres; stems several, two or three feet high, round, jointed, hollow, leafy; leaves grassy, long, narrow, smooth, with long, close, striated, smooth sheaths; stipula short, somewhat membranous, decurrent, entire; panicle two feet or more in length, erect.—It is common in all the waters from Canada to Florida: flowering in July and August.

2. Zizania Effusa; *Jamaica Wild Rice.* Panicle loose, much branched; male and female flowers interspersed. The stems are as thick as the little finger, and appear to be several feet high; leaves longer and broader than in the preceding species, with a strong midrib; panicle large, with numerous, whorled, repeatedly compound branches. Sloane calls this the Trumpet Reed.—It is common in all the lagoons of Jamaica.

3. Zizania Miliacea; *Millet-seeded Wild Rice.* Panicle loose, much branched; male and female flowers interspersed; glumes with short awns; seed ovate, smooth. Stem thick; permanent corolla tumid, and, like the seed, somewhat ovate, with very short awns: perennial, flowering in July and August.—Found in the inundated meadows and ditches of Pennsylvania and Carolina. Perennial.

4. Zizania Fluitans; *Floating Wild Rice.* Spikes solitary, axillary, about four-flowered, the upper ones male; glumes beardless. It is of a humble stature, with slender branched floating stems; leaves floating, linear, flat; spikes bristle-shaped, the lower ones female. All the glumes are destitute of awns. Perennial.—Found upon the banks of lakes Champlain and St. Lawrence, flowering in July. Perennial.

5. Zizania Terrestris; *Land Wild Rice.* Panicle nearly simple. Stems round, leafy, jointed; leaves long, narruw, green, rigid, sharply pointed; flower-stalks slender, from the sheaths of the leaves; glumes leafy, bearing round, blackish, glassy buds, which, when bruised with the juice of Beetle-nut, and applied to the tongue, are supposed to cure the thrush to which children are subject.—Found in sandy ground upon the coast of Malabar.

Ziziphora; a genus of the class Diandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, tubular, cylindrical, very long, striated, bristly, with five minute marginal teeth, and bearded in the orifice. *Corolla:* of one petal, ringent; tube cylindrical, the length of the calix; border minute, its upper leaf ovate, flat, reflexed, undivided, lower spreading, broadest, in three round equal segments. *Stamina:* filamenta two, simple, spreading, about the length of the corolla; antheræ oblong, distant. *Pistil:* germen superior, four-cleft; style bristle-shaped, the length of the corolla; stigma cloven-pointed, inflexed. *Pericarp:* none, except the calix remaining unchanged, a little gibbous at the base. *Seeds:* four, oblong, obtuse, gibbous at one side, angular at the other, very much shorter than the calix. Essential Character. *Corolla:* ringent, its upper lip reflexed, flat, undivided. *Calix:* thread-shaped. *Seeds:* four. The plants of this genus are slender, generally aromatic herbs, or diminutive shrubs, of humble growth, with the habit of Thyme.——The species are,

1. Ziziphora Capitata; *Oval-leaved Ziziphora.* Flowers fasciculated, terminal; leaves ovate, hardly an inch long, furrowed with parallel veins. Root fibrous, branched, and zigzag; stem erect, three or four inches high, when cultivated much taller, square, leafy, usually with two opposite spreading branches, besides the central part, clothed all over with fine, short, curved, hoary pubescence; footstalks one-eighth as long as the leaves; bractes four at the top of each branch, nearly sessile, like the leaves, but larger, more pointed and fringed, somewhat heart-shaped at the base, about the length of the flowers, which are numerous in each head; calix half an inch long, furrowed, bristly, a little wavy, with slender, sharp, purple teeth; corolla with a white downy zigzag tube, and pale purplish border; stamina prominent, about as long as the lower lip, with bluish antheræ. It is a hardy annual, flowering in July and August.—Native of Syria, Tauria, and the isle of Cyprus.

2. Ziziphora Hispanica; *Spanish Ziziphora.* Flowers axillary; leaves obovate, pointed, many-ribbed. Root annual; stems three or four inches high, cross-branched and bushy, downy with minute recurved hairs; branches leafy; flowers two or three together, sessile; calix tapering upwards, strongly furrowed, hispid, about the length of the leaves; corolla externally downy. The dried leaves retain a powerful smell of Pennyroyal.—Native of Spain.

3. Ziziphora Spicata; *Spiked Ziziphora.* Flowers in racemose spikes, imbricated; bractes ovate, acute, ribbed; leaves lanceolate, somewhat toothed. Stem from ten to eighteen inches high, throwing out from the base a branch or two as tall as itself; flowers several, on short stalks, standing near together. This is suspected to be a variety of the preceding species, but seems to differ in having the stem-leaves lanceolate, narrower than those that accompany the flowers, which are ovate, not obovate. Annual.—Native of Spain.

4. Ziziphora Tenuior; *Spear-leaved Ziziphora.* Flowers axillary; leaves ovate-lanceolate, taper-pointed, acute, entire. Root annual; stem a span high, with many square downy leafy branches; calix about half the length of the leaves, hoary, with fine recurved pubescence, more or less intermixed with long prominent bristly hairs; its lower part swelling much as the seeds ripen; corolla pale, hairy externally, with a dilated throat.—Native of Syria.

5. Ziziphora Acinoides; *Basil-leaved Ziziphora.* Flowers axillary; leaves ovate, stalked, many-ribbed, somewhat serrated, dotted with pellucid spots; stems diffuse, branched, bluntly quadrangular, finely downy; calix cylindrical, strongly ribbed, not downy, but beset with numerous prominent horizontal hairs; corolla hairy, its border larger than the first and second species, scarcely so long as the third, of a light purple or lilac colour, the lip especially; antheræ large, ovate, purple.—Native of Siberia.

6. Ziziphora Taurica; *Narrow-leaved Ziziphora.* Flowers axillary; leaves linear-lanceolate, striated, obtuse, entire. Root annual, long, tapering and zigzag; stems one or more, scarcely divided, except at the bottom, ascending, nearly a span long, not composed of opposite branches crossing each other, as in the fourth species.—Native of Mount Caucasus and its neighbourhood, among limestone rocks, or about the stony banks of torrents, flowering in June and July.

7. Ziziphora Serpyllacea; *Thyme-headed Ziziphora.* Clusters terminal, capitate, somewhat leafy; leaves lanceolate, naked, even, obtuse; stems rather shrubby, ascending, woody, and their branches hoary, with fine recurved dense hairs; flowers stalked, crowded at the summit of each branch into a close tuft, some of the lowermost axillary; flower-stalks round, clothed with the finest possible hoary pubescence, as are also the strong ribs of the calix, the teeth of which are fringed with long white hairs.—Native of the grassy hills of Caucasus, flowering from June to August.

8. Ziziphora Dasyantha; *Hairy-headed Ziziphora.* Clusters terminal, capitate, somewhat leafy; calix densely hairy; leaves ovate, obtuse, notched; stems procumbent. Root perennial and rather woody, as is the lower part of the spreading, nearly prostrate, hairy, purplish stems; flowers numerous, crowded into very dense oval heads.—Native of mountainous parts of Georgia, flowering from July to September.

Ziziphus; a genus of the class Pentandria, order Monogynia.—Generic Character. *Calix:* perianth inferior, of one leaf, nearly flat, in five spreading, ovate, equal, coloured, deciduous segments. *Corolla:* petals five, minute, obovate, between the segments of the calix, but much shorter, opposite to the stamina, spreading horizontally. *Stamina:* filamenta five, short, lying over the petals, and not half so long; antheræ roundish, of two lobes. *Pistil:* germen superior, orbicular, depressed; style one, very short; stigmas two or three, obtuse. *Pericarp:* drupe oval or roundish, pulpy, of one cell. *Seed:* nut solitary, the shape of the drupe, of one or two cells, with solitary kernels. Essential Character. *Calix:* flattish, in five deep segments. *Petals:* five, opposite to the stamina. *Drupe:* superior. *Nut:* of one or two cells.——The species are,

* *Without thorns or prickles.*

1. Ziziphus Lineata; *Veiny Jujube.* Stem erect, unarmed; leaves roundish-ovate, obtuse, wavy; clusters terminal, their lower flowers axillary. This is a bushy shrub, often as tall as a man, with copious, alternate, round, leafy, finely downy branches; flowers about the ends of the branches, stalked, partly axillary, partly collected into terminal smooth clusters; calix a little concave or bell-shaped at the base; its segments lanceolate, as also are the petals; antheræ black before they burst; drupe small, oval, seated on the orbicular permanent base of the calix.—Found on the French island, in the river of Canton, flowering in September.

2. Ziziphus Volubilis; *Twining Jujube.* Stem twining, unarmed; leaves ovate, acute, somewhat wavy; umbels axillary and terminal, stalked. Flowers small, greenish-yellow; fruit oblong, violet-coloured; branches round and smooth.—Found in deep swamps near the sea-coast from Virginia to Carolina, flowering in June.

3. Ziziphus Peruviana; *Peruvian Jujube.* Stem unarmed; leaves elliptic-obovate, sparingly and minutely toothed, somewhat angular, rather fleshy, smooth; petals acute, longer than the calix. This is an evergreen, branching, loosely spreading shrub, about three feet high, smooth in every part; branches a little zigzag, nearly round; petals oval, pointed, flat, larger than the calix.—Native of Peru.

4. Ziziphus Emarginata; *Notched Jujube.* Stem erect, unarmed; leaves roundish-ovate, emarginate; umbels axillary, stalked; petals none. Stem shrubby; branches round, erect, rigid, with smooth gray bark, and angular extremities; footstalks short; calix concave, with a spreading limb, in five acute segments, divided as it were into two cavities; filamenta very short, inserted below the divisions of the calix; antheræ ovate, embraced at each side by the hollows in the segments of the calix; stigmas two, obtuse.—Found in the island of St. Bartholomew.

** *With prickly Branches.*

5. Ziziphus Lotus; *Lotus Jujube.* Prickles in pairs, one of them hooked; leaves elliptic-oblong, slightly crenate, three-ribbed, smooth on both sides. This has the habit of a Rhamnus, and the flowers of the Common Jujube; but the fruit is rounder, smaller, and sweeter, about the size of sloes, with a large stone. It is produced on every part of the branches, like gooseberries, whereas that of the Common Jujube grows only on the slender annual shoots thrown out from the ends of the branches. The latter (the 15th species) is twenty feet or more high, with a large furrowed stem, twisted branches, knotty at the extremities, and larger oblong leaves; while this is only three or four inches high, with numerous shoots from the same root, which are smoother, straighter, and paler or whitish; the leaves small, round, and more rigid. The prickles grow in pairs, both of them very straight, slender, and sharp, when young, but in process of time one becomes thickened and hooked, the other much elongated, remaining quite straight. The Arabs call this plant *Seedra.*—Native of Africa, particularly of Tunis, in a tract called Jereed, formerly the country of the *Lotophagi.*

6. Ziziphus Napeca; *Smooth Indian Jujube.* Prickles generally in pairs, hooked; corymbs axillary, many-flowered; leaves ovate, acute, finely serrated, smooth on both sides; fruit elliptical. Branches somewhat zigzag, round, or a little angular, with smooth whitish bark, rough with mealy down when young, like the flower-buds, stalks, and young leaves; prickles stout, recurved, dark brown; footstalks a quarter of an inch long, a little downy; flowers very numerous, in dense, compound, downy or mealy, corymbose clusters, on short axillary stalks; drupe like an olive, elliptical, or somewhat

ovate, its flavour acid and astringent.—In Ceylon, Amboyna, and other islands of the West Indies, of which this fruit is a native, it is seldom eaten, but with salt, or as a sauce, to excite appetite.

7. Ziziphus Jujuba; *White-leaved Indian Jujube.* Prickles solitary, deflexed; corymbs axillary, many-flowered; leaves roundish-ovate, obtuse, downy, and snow-white beneath. When wild it becomes a moderately-sized tree; the branches, flower-buds, stalks, and backs of the leaves, are all white, with a fine, dense, entangled, rather starry pubescence; flowers white, sometimes six-cleft, and hexandrous; style divided; drupe globular, or somewhat heart-shaped; nut rugged, with two green kernels. The fruit is agreeably acid. In England it is a stove-plant, flowering in April and May.—Native of the East Indies.

8. Ziziphus Xylopyrus; *Wooden-fruited Indian Jujube.* Prickles solitary, recurved; leaves ovate, rather acute, somewhat heart-shaped, downy beneath; flowers corymbose. This tree is seldom higher than a man; branches hoary; flowers in axillary stalked corymbs; calix downy; drupe dry, insipid, slightly astringent, larger than a cherry; nut rugged.—Native of desert places, at the bottom of hills, in the East Indies.

9. Ziziphus Oenoplia; *Velvet-leaved Jujube.* Prickles solitary, conical, recurved; leaves unequally ovate or half heart-shaped, acute, silky beneath. This is a small tree with downy branches, and short thick hooked prickles; flowers in little dense silky axillary tufts.—Native of Ceylon.

10. Ziziphus Iguanea; *Lizard Jujube.* Prickles in pairs, unequal, divaricated; leaves ovate, pointed, serrated, smooth on both sides; clusters axillary, monœcious; petals wanting; fruit roundish. This is an inelegant training shrub, with round, zigzag, scarcely downy branches. The prickles are long and slender, in pairs under each footstalk, one of them always straight, the shortest curved, but not remarkably; flowers small, yellow; drupe roundish, yellow, with a sweet pulp, and a rugged one-celled nut.—It is found in the West Indies, and on the continent of America, in bushy, rocky, or stony places, frequented by the Lacerta Iguana, which is fond of the fruit, and hence its trivial name.

11. Ziziphus Chinensis; *Chinese Jujube.* Young branches prickly, downy, old ones unarmed; leaves ovate-oblong, sharply serrated; petals reflexed under the calix. It is a shrub three or four feet high, losing its slender unequal bristle-like prickles as the branches advance; footstalks short and downy; flowers small, whitish, axillary, solitary, or in pairs, remarkable for their having petals so completely reflexed and concealed by the calix, as not to be visible when viewed vertically.—Native of China.

12. Ziziphus Rotundifolia; *Round-leaved Jujube.* Prickles in pairs, one of them recurved; leaves roundish-oval, downy beneath. Branches slender, cylindrical; prickles small; footstalks very short.—Native of Ceylon.

13. Ziziphus Angulata; *Angular-branched Jujube.* Prickles in pairs, straight; leaves roundish-oval, somewhat toothed, smooth on both sides; branches acutely angular; which strikingly distinguishes this species from all the rest.—Native country unknown.

14. Ziziphus Vulgaris; *Common Jujube.* Prickles in pairs, unequal; leaves ovate, abrupt, bluntly serrated, smooth; flowers in axillary tufts; fruit elliptical. When wild it attains the size of a small tree, with round, smooth, glaucous branches, zigzag and leafy when young. The prickles make no appearance on the young leafy shoots, but the following year they become strong thorns, one of them an inch long, the other much shorter, and sometimes, but not always, recurved; flowers yellowish, on short stalks, in little axillary tufts, not much longer than the footstalks; petals obtuse, half the length of the calix; stigmas two or three; drupe the size and shape of an olive, blood-red, sweet, mucilaginous, esteemed good in soreness or inflammation of the mouth and throat, but not received in our present practice.—Native of the south of Europe. This has been long cultivated in England, but requires the shelter of a green-house, and never bears any thing but blossoms.

15. Ziziphus Spina Christi; *Christ's-thorn Jujube.* Prickles in pairs, straight; corymbs axillary, stalked, many-flowered; leaves ovate, finely crenate, smooth on both sides; fruit globose, the size and shape of a sloe; footstalks scarcely an inch long, downy on their upper side; bractes awl-shaped.—Native of Ethiopia and Palestine.

Zoegea; a genus of the class Syngenesia, order Polygamia-Frustranea.—Generic Character. *Common Calix:* ovate, imbricated, of numerous lanceolate fringed scales, the inner ones linear-lanceolate, chaffy, longest. *Corolla:* compound, radiant; florets of the disk numerous, perfect, of one petal, with a slender tube, and a limb in five deep lanceolate erect segments, those of the radius fewer, neuter, of one flat, ligulate, abrupt, sharply five-toothed petal. *Stamina:* in the florets of the disk; filamenta five, short; antheræ united into a cylindrical tube. *Pistil:* in the same florets; germen short; style capillary, very long, erect; stigma short, cloven: in the radiant florets; germen a rudiment only, without style or stigma. *Pericarp:* no other than the unaltered closed calix. *Seeds:* in the florets of the disk, solitary. *Down:* bristly; in the radius none. *Receptacle:* bristly. *Observe.* This genus differs from *Cantaurea* only in its flat or ligulate, not tubular, florets of the radius. Essential Character. *Receptacle:* bristly. *Seed-down:* of simple bristles. *Florets:* of the radius ligulate. *Calix:* imbricated.——The species are,

1. Zoegea Leptaurea; *Yellow Zoegea.* The stem is much branched, spreading in every direction, leafy, angular, and roughish, twelve or eighteen inches high; leaves alternate, distant, roughish, entire, the lower ones pinnatifid, the rest undivided, obtuse, tapering down into a footstalk; flowers solitary, on long terminal stalks, large, nearly two inches broad; scales of the calix delicately fringed with tawny bristles; corolla of a shining golden yellow. It is a hardy annual, flowering in July and August.—Native of Siberia.

2. Zoegea Capensis. See *Athanasia Pumila.*

Zornia; a genus of the class Diadelphia, order Decandria.—Generic Character. *Calix:* perianth inferior, of one leaf, bell-shaped, two-lipped; upper lip broad, abrupt, emarginate, lower in three deep segments, the middle one longest. *Corolla:* papilionaceous; standard inversely heart-shaped, reflexed, revolute at the sides; wings ovate, erect, smaller than the standard; keel divided at the base, bluntly rectangular, the length of the wings. *Stamina:* filamenta in two sets; antheræ, five of them oblong, five alternate ones globose. *Pistil:* germen ovate; style awl-shaped, horizontal; stigma simple. *Pericarp:* legume of several roundish, compressed, single-seeded joints, hispid, with barbed prickles, not bursting. *Seeds:* solitary, kidney-shaped. These plants are herbaceous, with one or two pairs of conjugate leaves, without an odd one; flowers small, in axillary spikes, with large leafy bractes. Essential Character. *Calix:* bell-shaped, two-lipped; the upper lip abrupt. *Standard:* revolute. *Keel:* angular; five alternate antheræ oblong, five globose. *Legume:* of several single-seeded close hispid joints.——The species are,

1. Zornia Angustifolia; *Narrow-leaved Zornia.* Leaflets

two, lanceolate, uniform; bractes ovate, ribbed, fringed, imperfectly reticulated, shorter than the legume, marked with glandular dots; prickles of the legume rough. Root annual, tapering, warty; stems several, diffuse, from four or five inches to a foot long, round, slender, zigzag, smooth, leafy, with short alternate branches; leaves simply conjugate, alternate; stipules half arrow-shaped, ribbed, entire, pointed at each end; flowers yellow, in axillary, solitary, stalked, lax, bracteated spikes, longer than the leaves; each spike of from three to eight alternate flowers.—Native of the East Indies, in a sandy soil.

2. Zornia Reticulata; *Reticulated Zornia.* Leaflets two, lanceolate, the lower ones elliptical; bractes ovate, as long as the legume, strongly reticulated and fringed, without glandular dots; legume and its prickles downy. The root, though said to be annual, is somewhat woody; herb larger than the last, and quite specifically distinct; the stems are straight, a foot long, scarcely branched; spike many-flowered; flowers yellow, the standard sometimes purplish. The bractes also afford a clear specific distinction in their strongly marked, elevated, veiny reticulations, and the total want of resinous or glandular dots, though their whole surface is minutely granulated, something like those of the preceding species.——Native of the savannas of Jamaica.

3. Zornia Conjugata; *Ovate Zornia.* Leaflets two, ovate, uniform; bractes ovate, ribbed, fringed, imperfectly reticulated, shorter than the legume, without glandular dots; legumes fringed; its disk and prickles smooth; flowers yellow. This is the size of the preceding, but differs essentially.—Native of Ceylon and Tranquebar.

4. Zornia Latifolia; *Broad-leaved Zornia.* Leaflets two, roundish-ovate, the lower ones orbicular; bractes linear-lanceolate, ribbed, somewhat hairy, longer than the downy legumes. Root woody, annual; stems several, prostrate, from six inches to a foot long, straight, round, downy; corolla yellow.—Found in Guiana.

5. Zornia Heterophylla; *Various-leaved Zornia.* Leaflets three or four, lanceolate; stipules half arrow-shaped; base of the bractes elongated and acute. Stem herbaceous, decumbent, thread-shaped, smooth, a foot or more in length; footstalks rather longer than the leaflets; spikes axillary, many times longer than the leaves, at least the lower spikes, and consisting of ten or twelve flowers, concealed by the ovate three-ribbed bractes, each of which is elongated at the base into an ovate-acute appendage, nearly half its own length.—Native of the Cape.

6. Zornia Tetraphylla; *Four-leaved Zornia.* Leaflets four, lanceolate; stipules ovate; base of the bractes somewhat elongated, obtuse. This is about a foot high, much branched; flowers yellow. Perennial.—Native of the sandy fields of Lower Carolina.

Zosima; a genus of the class Pentandria, order Digynia.—Generic Character. *General* and *partial Umbel:* of many unequal rays. *General* and *partial Involucrum:* of many, linear-lanceolate, acute, unequal, villous, permanent leaves. *Perianth:* of five unequal, very short, permanent teeth. *Corolla:* universal, nearly regular, and uniform; flowers partly perfect and fertile; the central and lateral ones, in each umbel, male: partial of five, nearly equal, spreading, inversely heart-shaped, deflexed petals, rather concave on each side at the keel, tapering at the base, obliquely inflexed at the point, which is linear-lanceolate, acute, involute, channelled. *Stamina:* filamenta five, spreading or deflexed, straight, longer than the involute corolla, dilated at the base; antheræ versatile, roundish, two-lobed. *Pistil,* in the perfect florets; germen inferior, ovate, compressed, villous; styles two, thread-shaped, channelled, their tumid base wavy and crenate at the margin, at length reflexed and permanent; stigmas simple, obtuse. *Pericarp:* fruit roundish-obovate, compressed, finely downy, bordered; the border externally tumid, and somewhat corrugated, internally striated, emarginate at the summit, crowned with the styles on their short, nearly sessile, crisped base, thickened at the bottom; the disk elevated and striated. *Seeds:* two, of a similar shape, convex in the middle, with three elevated narrow central ribs, and two marginal ones; their interstices in the upper half occupied by four coloured stripes. Essential Character. *General* and *Partial Involucrum:* of many permanent leaves. *Corolla:* uniform; some flowers male. *Calix:* tumid, five-toothed. *Petals:* nearly equal, obovate, inflexed. *Fruit:* roundish-obovate, compressed, villous, with a corrugated border; the disk ribbed.——The only known species is,

1. Zosima Orientalis; *Oriental Zosima.* Leaves opposite, stalked, thrice pinnate, hoary with short pubescence; leaflets small, wedge-shaped, lobed, entire at the edges; umbels two or three inches in diameter, on long stalks, terminal; partial ones of from twelve to fifteen milk-white or yellowish-green flowers; stem erect, nearly two feet high, cylindrical, furrowed, somewhat branched and slightly leafy, about the thickness of a swan's quill; root biennial, tap-shaped, milky. The whole herb, when bruised, smells like Smallage.—Native of Persia, Georgia, and other countries about Mount Caucasus, flowering in the early part of summer.

Zostera; a genus of the class Monandria, order Monogynia.—Generic Character. *Calix:* spadix linear, flat, sheathed by the base of a leaf, bearing an indeterminate number of flowers on one side; perianth none. *Corolla:* none. *Stamina:* filamenta none; anther sessile, erect, closely pressed to the spadix, simple, cylindrical, a little wavy, tapering at the end. *Pistil:* germen solitary, parallel to the anther, and of nearly a similar shape; style one, obliquely curved, shorter than the germens; stigmas two, linear, acute, spreading. *Pericarp:* capsule pendulous, elliptical, membranous, of one cell, not bursting. *Seed:* solitary, oblong, striated. Essential Character. *Spadix:* linear, sheathed by the base of a leaf, bearing the flowers on one side. *Perianth* and *Corolla:* none. *Anther:* sessile. *Stigmas:* two, linear. *Capsule:* with one seed.——The species are,

1. Zostera Marina; *Common Grass-Wrack.* Leaves entire, obscurely three-ribbed; stem slightly compressed. Root perennial, fibrous; stems roundish, smooth, trailing to a great extent, throwing out fibres here and there; their branches floating and leafy. Though the whole herb is flaccid and tender, yet it is said to be used by the Swedes for thatching; but answers better, like other sea-weeds, for manure.—Native of the sea-shore, or salt muddy ditches and creeks throughout Europe, flowering in autumn. There are many varieties, some of which, it is suspected, will prove distinct species when examined.

2. Zostera Uninervis; *Single-ribbed Grass-Wrack.* Leaves entire, single-ribbed; stem compressed, swelling at the joints.—Found on the coast of the Red Sea, near Mucha, growing under water, and resembling overflown grass.

Zoysia; a genus of the class Triandria, order Digynia.—Generic Character. *Calix:* glume of one valve, single-flowered, ovate-oblong, compressed, cartilaginous, smooth, rigid, keeled, incurved, gaping at the apex of one edge, convex on the one side, flattish on the other. *Corolla:* glume of two thin membranous valves, enclosed within the calix, awnless; nectary none. *Stamina:* filamenta three, capillary, short; antheræ hastate. *Pistil:* germen superior, linear,

minute; styles two, the length of the calix; stigmas prominent, feathery. *Pericarp:* none, except the permanent glumes. *Seed:* solitary, linear, invested with the calix and corolla. ESSENTIAL CHARACTER. *Calix:* of one valve, single-flowered, compressed, cartilaginous. *Corolla:* of two membranous valves within the calix. *Stigmas:* feathery. *Seed:* linear, invested with the glumes.——The only known species is,

1. Zoysia Pungens; *Sharp-pointed Zoysia.* This is a small perennial grass, with creeping roots; stems alternate, ascending, slender, three or four inches long; leaves two-ranked, spreading, involute, sharp-pointed, smooth, an inch or an inch and a half long, with pale, furrowed, close sheaths, concealing the joints of the stem; stipula of several spreading hairs; clusters terminal, solitary, quite simple, of ten or twelve, nearly sessile, alternate, erect flowers, remarkable for their smooth ivory-like glumes, about two lines in length, out of which project the feathery stigmas.—Found in sandy ground, upon the coast of Malabar; and near Port Jackson in New South Wales.

Zuccagnia; a genus of the class Decandria, order Monogynia.——GENERIC CHARACTER. *Calix:* perianth inferior, of one leaf, coloured; tube turbinate; border in five deep, oblong, obtuse, permanent segments, the lower ones a little the longest. *Corolla:* petals five, obovate, inserted into the calix, the uppermost broadest, vaulted. *Stamina:* filamenta ten, awl-shaped, ascending, hairy in their lower part, about as long as the corolla; antheræ roundish, of two lobes, divided by a furrow. *Pistil:* germen superior, roundish, compressed; style capillary, of the length and position of the stamina, smooth; stigma funnel-shaped. *Pericarp:* legume ovate, oblique, compressed, hairy, of one cell and two valves. *Seed:* solitary, ovate, compressed, attached by its stalk to the summit of the legume. ESSENTIAL CHARACTER. *Calix:* bell-shaped, its border in five permanent segments. *Petals:* five, obovate, the upper one broadest, vaulted. *Legume:* of one cell, and two valves. *Seed:* solitary.——The only known species is,

1. Zuccagnia Punctata; *Dotted Zuccagnia.* Leaves alternate, abruptly pinnate, of numerous, alternate, sessile, elliptical, entire, glutinous leaflets, each one-third of an inch long, marked on both sides with blackish resinous dots; clusters terminal, solitary, simple, of several rather small flowers; petals saffron-coloured, with darker veins; anthers deep orange. Stem shrubby, about four or five feet high, with numerous twisted glutinous branches.—Native of Chili, found on hills, bearing flowers, as well as seed, in January.

Zwingera; a genus of the class Decandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth inferior, small, in five deep, ovate, acute segments. *Corolla:* petals five, oblong, obtuse, spreading. *Stamina:* filamenta ten, capillary, dilated and hairy at the base, shorter than the corolla; antheræ ovate. *Pistil:* germen superior, seated on a glandular receptacle, roundish, with five deep furrows; style longer than the stamina, thread-shaped, striated; stigmas five, simple. *Pericarp:* capsules five, coriaceous, ovate, spreading, of one cell. *Seeds:* solitary, ovate. ESSENTIAL CHARACTER. *Calix:* in five deep segments. *Petals:* five. *Filamenta:* dilated and hairy at the lower part. *Capsules:* five, coriaceous, seated on a fleshy receptacle. *Seed:* solitary. ——The only known species is,

1. Zwingera Amara; *Bitter Zwingera.* Leaves alternate, stalked, either ternate or pinnate, of two or three pair, with an odd one, of elliptic-lanceolate, pointed, emarginate, entire, smooth leaflets, the largest of which is three and a half inches long, and an inch or more in breadth; flowers five or six together, in little axillary clusters; petals whitish, surrounded with a green disk; fruit yellow, the inner rind green and bitter. This shrub is not more than seven or eight feet high; the stem is three or four inches in diameter, with a soft white wood.—Native of Guiana, flowering and fruiting in June.

Zygophyllum; a genus of the class Decandria, order Monogynia.—GENERIC CHARACTER. *Calix:* perianth inferior, of five ovate, obtuse, concave, erect leaves. *Corolla:* petals five, dilated upwards, obtuse, emarginate, rather longer than the calix; nectary of ten converging, pointed leaves, or scales, sometimes divided, embracing the germen, each of them attached to one of the filaments, near its base. *Stamina:* filaments ten, awl-shaped, attached to the outside of the nectary, shorter than the corolla; anthers oblong, incumbent. *Pistil:* germen superior, oblong, tapering at the base; style awl-shaped, the length of the stamens; stigma simple. *Pericarp:* capsule oblong, or roundish, with five angles and five intermediate furrows, five cells and five valves; the partitions linear, from the middle of each valve. *Seeds:* several, roundish, kidney-shaped, inserted alternately, in two rows, into the middle of the valves. *Observe.* Linnæus notices, that the seed-vessel differs in shape in the different species, and in some the flowers are four-cleft and octandrous. ESSENTIAL CHARACTER. *Calix:* of five leaves. *Petals:* five. *Nectary:* of ten scales, embracing the germen, and bearing the stamina. *Capsule:* of five cells, superior.——The species are,

1. Zygophyllum Simplex; *Cylindrical-leaved Bean Caper.* Leaves simple, sessile, cylindrical. This is the most common of all plants in the driest parts of the deserts of Arabia, where it is known by the name of *Garmal*, and esteemed very good, by the Arabs, for removing specks in the eyes, for which purpose they apply the bruised leaves, mixed with water. The root is simple, tapering, apparently annual; stem prostrate, repeatedly forked, round, smooth; flowers yellow; petals round, with long claws.

2. Zygophyllum Cordifolium; *Heart-leaved Bean Caper.* Leaves simple, sessile, opposite, roundish, somewhat heart-shaped. This is a green-house shrub, flowering in October. —Native of the Cape of Good Hope.

3. Zygophyllum Fabago; *Common Bean Caper.* Leaves conjugate, stalked; leaflets obovate; calix smooth; petals entire; capsule oblong; stem herbaceous. The root is tapering, fleshy, producing from its crown several spreading, alternately branched, leafy, round, herbaceous smooth stems, about two feet high. The flowers are yellow, on simple, axillary stalks. This is a hardy herbaceous perennial, flowering in autumn.—Native of Syria, Persia, Barbary, &c. This is propagated from seeds, which should be sown in the spring, in pots filled with light sandy mould, or on a hot-bed. When the plants have grown a few inches, remove them into separate pots, plunging them into a hot-bed, admitting air so as gradually to harden them to the open ground. They should be protected for a winter or two, and then turned out into borders or other parts, where the situation is warm, and the soil dry and rubbishy, as they are of a succulent nature.—The seventh, eighth, ninth, and eleventh species, are capable of being increased by cuttings and seeds; the cuttings should be planted out in the spring or summer, in pots filled with light sandy mould, and plunged in a hot-bed; being occasionally watered, they will quickly push forth roots, and shoot at top; and when sown in the summer months, may be planted, or have the pots fixed in a shady place, where they require often watering, to take root. In each method they must be potted off separately towards autumn, in order to be moved into the green-house or glass-case in the beginning of autumn. The seeds should be sown in the spring in pots of light earth,

and plunged into a hot-bed, where they soon come up: when a little advanced in growth, prick them out in separate small pots; then water and replunge them into the hot-bed till they are firmly rooted, when they should be gradually hardened to the full air. In June set them out, to remain till the autumn, when they should be placed in the green-house, or wherever they can have adequate protection, during winter.

4. Zygophyllum Fœtidum; *Fœtid Bean Caper.* Leaves conjugate, stalked; leaflets obovate; calix downy; petals jagged; capsule roundish; stem shrubby. This is a hardy green-house shrub, flowering throughout the summer. The leaves have a strong fox-like scent.—Native of the Cape.

5. Zygophyllum Maculatum; *Spotted-flowered Bean Caper.* Leaves conjugate, stalked; leaflets linear-lanceolate; petals yellow with a red spot.—Native of the Cape.

6. Zygophyllum Coccineum; *Scarlet-flowered Bean Caper.* Leaves conjugate, on a fleshy stalk; leaflets cylindrical, smooth; capsule oblong. The stem is shrubby, ascending, much branched, about a foot and a half high; the petals red, pointed.—This plant, which all cattle refuse to eat, abounds in the desert between Cairo and Suez.

7. Zygophyllum Album; *White Bean Caper.* Leaves conjugate, on a fleshy stalk; leaflets obovate, downy and hoary; capsule roundish, five-lobed. The stem is woody, diffuse, much branched, and very leafy; the petals white, obtuse; crenate.—Native of Egypt, Cyprus, Barbary, &c. See the third species.

8. Zygophyllum Morgsana; *Four-leaved Bean Caper.* Leaves conjugate, nearly sessile; leaflets obovate, flat, smooth; stem shrubby; capsule roundish, tumid, five-lobed. This is a green-house shrub, flowering here during most part of the summer. The branches are quadrangular; flowers large, yellow; petals obovate, entire, streaked with purple at the base.—Native of the Cape. See the third species.

9. Zygophyllum Sessilifolium; *Sessile-leaved Bean Caper.* Leaves conjugate, sessile; leaflets obovate, flat, smooth; stem shrubby; capsule globose, undivided. Flowers drooping, orange-coloured. This green-house shrub flowers in July and August.—Native of the Cape. See the third species.

10. Zygophyllum Fulvum; *Tawny Bean Caper.* Leaves conjugate, sessile; leaflets obovate, flat, smooth; stem shrubby; capsule ovate, five-angled, acute.—Native of the Cape.

11. Zygophyllum Spinosum; *Spinous Bean Caper.* Leaves conjugate, sessile; leaflets linear, fleshy, smooth, flat above; stem shrubby; permanent stipules hooked, spinous. Stem bushy, shrubby, about a foot high, branched from top to bottom; the branches acutely quadrangular; leaves numerous; flowers drooping, large and handsome, on longish, solitary, lateral stalks; calix reddish; petals yellow, fading to white, nearly or quite entire.—Native of the Cape. See the third species.

12. Zygophyllum Microphyllum; *Small-leaved Bean Caper.* Leaves conjugate, somewhat stalked; leaflets inversely heart-shaped, smooth; stem shrubby, with ascending branches; capsule roundish, abrupt, of five compressed lobes; style permanent; flowers drooping, rather small, yellow. This is a hard, small-leaved, rigid, much-branched shrub.—Found at the Cape.

13. Zygophyllum Retrofractum; *Recurved Bean Caper.* Leaves conjugate, stalked; leaflets obovate, smooth; stem shrubby, with spreading recurved branches; flower-stalks shorter than the leaves.—Native of the Cape.

14. Zygophyllum Æstuans; *Surinam Bean Caper.* Leaves conjugate, sessile; leaflets obovate, abrupt; stem herbaceous, diffuse; stipulas five at each joint.—Found at Surinam.

15. Zygophyllum Lanatum; *Woolly-jointed Bean Caper.* Leavea ternate; leaflets papillary beneath; styles five; stem zigzag, woolly at the joints. The genus of this plant is doubtful.—Native of Sierra Leone.

16. Zygophyllum Arboreum; *Tree Bean Caper.* Leaves abruptly pinnate; stem arboreous. This is a very handsome tree, forty feet high; the trunk being about six feet; the head dense, widely spreading, and very ornamental; clusters axillary and terminal; flowers large and handsome, scentless; calix yellowish-green, smooth; petals orange-coloured, roundish, emarginate, cleaved. When it blossoms, this tree affords a most magnificent spectacle, from the innumerable flowers covering the bright green leafy head. The natives give the name of *Guay-acan* to this tree, the timber of which being hard, is used for cabinet work. The trunk is said to harden into stone by lying in the earth, being incorruptible; which seems to have arisen from its being found in a petrified state, as wood, otherwise perishable, often may be seen in our own country. It flowers in July.—Native of South America, on the sandy shore about Carthagena.

A SHORT TREATISE ON GARDENING.

Gardening is a branch of agriculture, that combines ornament with utility, and employs the utmost vigilance of cultivation to maintain and improve the excellency of vegetable productions. Gardens are of the greatest antiquity; in every age and country, gardening seems to have been the favourite study of mankind, and its pursuit a sort of passion engrafted on the species. They are usually considered as of three classes; the Flower Garden, Fruit Garden, and Kitchen Garden. The green-house, hot-house, and nursery, are repositories for productions belonging to all these classes.

Of the Situation, Soil, and Plan of a Garden.

As a garden usually takes up but a small portion of ground, and as the object of it is often not so much for the profit as the recreation and rational enjoyment which it affords to the proprietor, it will be always desirable to fix it in the most pleasant situation of which the selection is admissible. A site is to be preferred, which is neither very elevated nor very low; and which forms a gentle declivity, screened, if possible, from north and north-easterly winds. Of the two, a situation is better when too low, than when too high, on account of its greater warmth, unless the vicinity contains much stagnant water or marshy ground. The nature of the exposure of a garden is a matter of considerable importance: the best is that of the south-east; but, in an extensive and complete garden, it is desirable that part of it should have a northern aspect, in order that late crops should be raised with advantage. A plentiful supply of water is of great consequence, and running water is better than any other; pond-water will answer equally well for watering plants, but it will not be so wholesome in a garden, if entirely stagnant. Water drawn fresh from a spring is too cold for watering plants; and if no other can be procured, it should be exposed some time to the atmosphere before it is used.

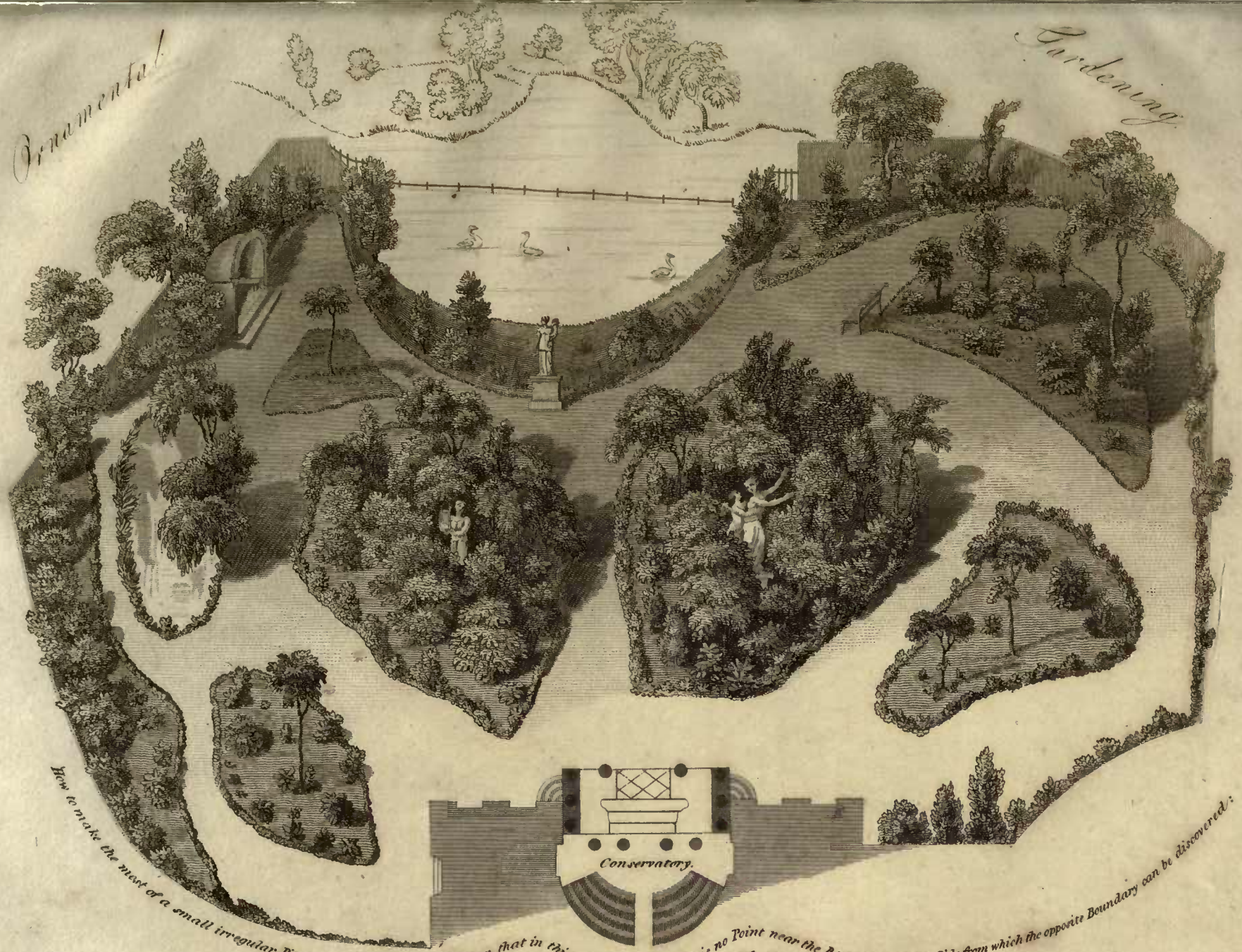
There are various opinions respecting the most proper and advantageous forms of a garden; but though much must depend on the nature of the situation, yet the square shape, or that approaching nearest to it, is probably the most convenient. But where this shape cannot be adopted, some ingenuity will be required to lay the ground out to the best advantage. The annexed Engraving, "How to make the most of a small irregular Piece of Ground," will convey to the tasteful gardener some ideas on this subject.

The size of Kitchen Gardens should always be fully sufficient for the extent of the family, varying from half an acre to a larger extent, within the fence. That of half an acre will, where there are wall and espalier trees, furnish sufficient employment for one man, and afford due supplies of vegetables and fruit for a family of more than a dozen persons.

Unless the soil of a garden be good, and sufficiently deep for the largest plants it is designed to maintain, the subsequent labour it will require will be immense, without being successful; and its productions will constantly exhibit symptoms of disease, which no attention can eradicate. A mellow loam, which is friable when tolerably dry, and neither clammy nor wholly unadhesive when wet, may be fully approved, as moderate labour and expense will fit it for any purpose, if it be sufficiently deep. Its depth should never be less than two feet, where trees and shrubs are required; even three feet is rather shallow; and for a really fine garden, even four feet of good soil may be considered necessary. Some think a medium loam the most proper, as being capable of sustaining different degrees of lightness in different parts, by the addition of sand and other similar materials, so as to suit different sorts of vegetables; and in others, of various degrees of tenacity and heaviness, by the use of clay or other cohesive substances. Where the under-soil is of the retentive kind, great care should be taken to have it well drained, since, unless this be effectually accomplished, healthy vegetables or trees can seldom be produced. In cases where fruit-trees, especially those of the finer sorts, as well as Apple and Pear kinds, are to be planted, a greater depth of good soil, as well as a greater degree of dryness, is in general necessary: if these do not exist, the expense of the garden will in the end be the least possible, if it be artificially increased. It is advisable to make the soil uniformly deep in every part, as well where the gravelled walks are to be made, as for the borders.

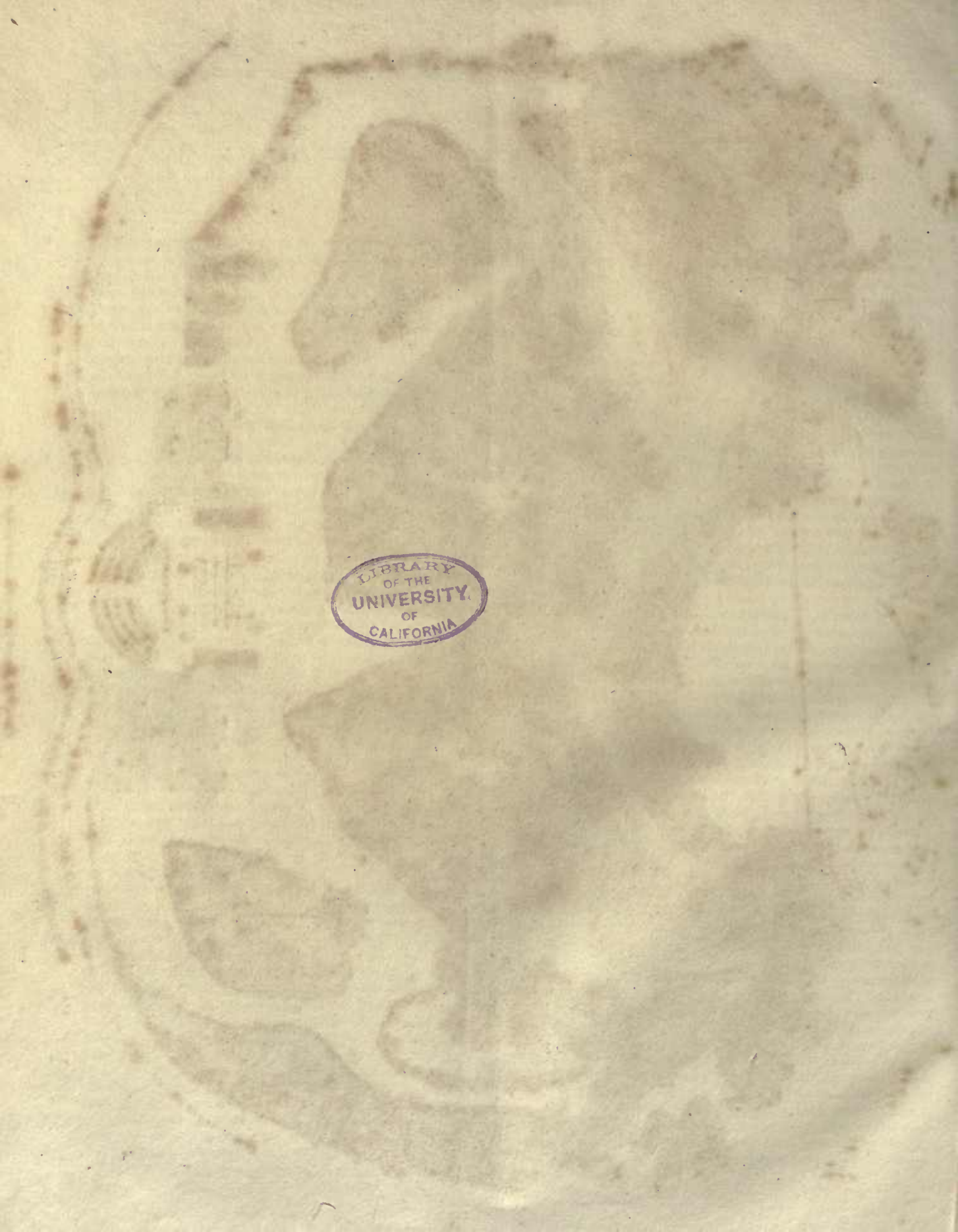
Where Gardens of the Ornamental or Flower kinds are wanted, they should be laid out so as to have open, sunny, sheltered exposures; forming, if possible, the connections between the pleasure-grounds and the kitchen-gardens, according to the general nature and situations of such grounds, so as to afford the most striking effect and variety that are possible. The nature of their forms may vary in proportion to the distribution of the lands, and the particular circumstances of their situation, being made square, circular, oblong, or in any other manner, according to the taste of the proprietor; the parts approaching the pleasure-grounds being mostly separated by walks, and the introduction of different sorts of the most curious, hardy, flowering, shrubby plants. The interior parts should have a neat ornamental distribution, so as to produce the most striking variety when the flowers are in bloom, and afford the greatest convenience in their cultivation. Gardens of this nature should contain all the different sorts of hardy, curious, ornamental flowering plants, whether of the bulbous, tuberous, or fibrous-rooted kinds, and be constantly kept in the neatest order.

The Kitchen Garden should be laid out in different methods, according to the differences in the circumstances of the ground. It is sometimes so managed, as to constitute a part of, or communicate with, the pleasure-ground; but where there is a sufficient extent of land, it is better to be distinct, or detached from it; and, in every case, as much concealed from the house as possible. The most convenient distribution is at some distance behind it; but on the sides it may answer very well, especially when not too contiguous, or so situated as to interrupt any particular prospect or view of the adjacent country. With regard to the nature of the situation most proper for this purpose, it should, when convenient, be where there is a gentle declination towards the south or south-east, in order that it may have the full advantage of the morning sun.



How to make the most of a small irregular Piece of Ground.— It will be seen, that in this Arrangement there is no Point near the Boundary on one Side from which the opposite Boundary can be discovered: Where the View is let into the adjacent Country, the Fence is sunk below the level of the Ground, and a little above the Water.

Published by Nuttall, Fisher & Dixon, Liverpool, March, 1818.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Ornamental Gardening.

Suggestions for making a regular form of Ground picturesque, by giving Views into the neighbouring Scenery.

H. Fisher Son & Cº London, 1828

Mr. Miller recommends the following rules to be observed in the disposition of a large garden: There ought always to be a descent of at least three steps from the house to the garden; this will render the house more dry and wholesome, and the prospect, on entering the garden, more extensive. The first thing that ought to present itself to view, should be an open lawn of grass; which ought to be considerably broader than the front of the building; and if the depth be one-half more than the width, it will have a better effect: if, on the sides of the lawn, there are trees planted irregularly, by way of open groves, the regularity of the lawn will be broken, and the whole rendered more like nature. For the convenience of walking in damp weather, the whole should be surrounded with a gravel walk, on the outside of which should be borders, three or four feet wide, for flowers; and from the back of these, the prospect will be agreeably terminated by a slope of evergreen shrubs; which, however, should never be suffered to curtail any agreeable prospect. The walks should lead by gentle windings through the different plantations, where shade and seclusion may be enjoyed at pleasure. Running water, where it can be introduced, has a much more agreeable effect than stagnant ponds. The several parts of the garden should be diversified; but wherever the eye takes in the whole at once, the two sides should be similar. Every where the greatest art is required to avoid the *appearance of art:* nothing is more offensive to the eye of taste, than trees and shrubs cut to symmetrical figures.—See the annexed Engraving for "Suggestions for making a regular form of ground picturesque, by giving views into the neighbouring scenery."

In the Kitchen Garden, which is often conjoined with the Fruit Garden, the border should be about eight or ten feet broad: the borders exposed to the south are fittest for early plants, and those exposed to the north for late ones, taking care not to plant any deep-rooting plants, especially Beans and Peas, very near the fruit-trees. The divisions of the ground must be determined by its size and shape; care should be taken not to have very small divisions, as they will require an unnecessary number of walks, and in the areas enclosed by treillages, plants will not thrive for want of a free exposure. A walk six feet broad will be sufficient for a garden of moderate size, but in a large one ten feet may be allowed; on each side of the walk, should be a border of three or four feet, between it and the espaliers. These borders are suitable for salads, and other plants, which neither take deep root nor continue long, and the sort should be varied each year.

In forming new Kitchen Garden grounds, where the soil is of a strong, stiff, heavy quality, they should be ploughed or trenched over three or four times, being exposed to the effects of frost, in pretty high ridges, for a winter, in order to bring them into a proper condition before the crops are put in. A crop of Potatoes or Beans also assists greatly to bring them into a proper state of pulverization for being planted with culinary vegetables. When the land is become sufficiently broken down and reduced, the wall and other trees, as well as different sorts of vegetable crops, may be put in. Some, however, put the fruit-trees in before this has been accomplished; but it is not a good practice, as they are liable to be injured by the digging which afterwards becomes necessary in preparing the soil in a proper manner.

In planting wall-trees, they should be set at different distances, according to their kinds: those of the Peach, Nectarine, Apricot, Plums, and Cherry descriptions, at fifteen, eighteen, or more feet; and for Figs and Pears, twenty are seldom too much, suitable aspects being chosen, according to their kinds. Between the wall-fruit trees, some at first introduce half or full standards, that the walls may at once be covered, removing them afterwards. Trees of the espalier kind are likewise frequently introduced in ranges round the main quarters, at the distance of about six feet from the side of the walk, and from fifteen to twenty in the rows, according to the sorts that are made use of. Within these ranges of espalier trees, good standards of tall growth are occasionally introduced, at the distance of thirty, forty, or more feet, in each direction. Fruit-trees, of the small shrubby kinds, such as Gooseberries, Currants, Raspberries, &c. where there are not outslips, are frequently introduced on the sides of the quarters, and as divisions to them when large, at the distance of eight or nine feet from each other. When planted in this way, they should be trained in the fan-form. But it is better, where it can be done, to have them in separate plantations, especially the first sort.

A constant attention to digging and weeding is indispensable to the success of a garden; as also the use of abundance of manure. For the properties of which, as well as Grafting, Inarching, Inoculation, &c. we refer to the different parts of this work, under their proper heads.

Of the Distribution of Crops.

This must be regulated by the nature of the situation, their particular kinds, as well as the taste and experience of the proprietor. On the narrow borders under the wall-trees, various sorts of small crops may be raised, both of the early and late kinds, according to the difference of the aspects; but all the deep-rooting sorts should be avoided, such as Cabbages, Cauliflowers, Beans, Peas, except those of the frame kind, as being injurious to the trees by the shade which they cause, as well as by depriving them of due nourishment. But the large parts of the borders next the walks are proper for raising all sorts of the more early crops, such as those of the Radish, Spinach, Lettuce, Carrots, French Beans, Salad herbs, and all the Dwarf Pea kinds that are cultivated in wide rows; those which have a southern aspect for the early crops; the eastern and western ones for succession crops of the several kinds; and the northern ones, as being more cool, for raising and pricking out many sorts of small plants, slips, and cuttings, in the summer season, when the other parts are apt to be too dry, and too much exposed to the heat of the sun.

All such borders as are next to the ranges of espalier trees, are well suited to the different low-growing crops, such as Lettuce, Spinach, Endive, Strawberries, &c. and for pricking out upon, at different seasons, many sorts of plants, to be afterwards transplanted into different situations, in order to complete their growth. But the quarters, or large divisions, should always be destined for the reception of the large principal crops, such as those of Onion, Leek, Carrot, Parsnip, Turnip, Beet, Potatoe, Cabbage, Cauliflower, Broccoli, Colewort, Kale, Pea, Bean, Scarlet Bean, Celery, Artichoke, Asparagus, and other similar kinds.

In every department, the greatest attention should be paid, to the keeping of the different parts fully cropped, as well as to neatness and regular order; and as the crops are removed from the ground in the autumn, it is often of great advantage to have it ridged up for the winter in a regular manner.

When the garden has been laid out, planted, and finished, it will be of much advantage to have a plan of it, with the names of the different trees introduced in their proper places. By this means the memory is greatly assisted, especially in extensive grounds, and the various operations performed with more regularity and exactness.

Of Planting.

The most proper seasons for planting in each year, are spring and autumn. The roots of all plants that are taken up should be preserved entire, and not thinned or lopped, unless when diseased. As planting is usually performed in rows, care should be taken that the direction of the rows be north and south: the ground and the plants will then receive the greatest portion of sunshine, and the plants will be more thriving than any other position at similar distances could render them. The modes of planting in ordinary use are the following:

1. *Hole Planting.* This mode of planting is generally employed for trees or shrubs that have attained a good size. It consists in digging holes sufficiently large to admit the whole of their roots in their natural position, or in the same position, and at the same depth, which they had previous to their removal. The earth at the bottom of the hole should be well loosened; the roots should be covered with the finest part of the soil, and none of the soil should be returned till it has been broken up and pulverized. If the plants be of the tender kind, the surface of the ground, after planting it, should be covered with long dung or turfs, to prevent its being injured by cold weather before it has properly taken hold of the soil.

2. *Trench Planting.* In digging a trench, for planting Box edgings, Asparagus, nursery plants, &c. a line is generally used as a guide; the depth and width of the trench must be proportioned to the roots it has to admit, and that side of the trench next the line is made perpendicular, or nearly so; the plants are set against the upright side, and the earth being returned, the plants are fixed by treading it down.

3. *Trenching-in Planting.* This method is adopted on light soils, where the plants are to have considerable spaces between them, and therefore a continued trench is not requisite. It is performed by two persons; a line being set up, or a mark made as a guide, one person turns out a sufficient quantity of soil to admit one plant, which the other person immediately puts into the hole, and the digger proceeding to make another hole, throws the soil he takes up into the hole last made. When the row is completed, the earth is trodden down, as in the last mode of planting.

4. *Slit Planting.* This is an expeditious mode of planting, and much used where large quantities of suckers and nursery plants are to be planted. In performing it, one person, having a line set up or marked, forms a crevice in the direction of the mark, he then draws his spade out, and forms another, by crossing the former in the middle; a boy following him, puts the sucker in at the crossing place, and finishes the operation by pressing the earth together with his foot.

5. *Drill Planting.* The drills or trenches are drawn by a hoe, at the distance and depth the seed requires; the seed is dropped in, and generally covered by manual labour. Bulbous roots, and large seeds, such as Walnuts and Beans, are frequently planted in this manner.

6. *Bedding-in Planting.* In this mode of planting, the soil having been first prepared by digging and pulverizing it thoroughly, it is formed into beds three or four feet wide, with alleys between them. The earth is then raked off the surface of each bed into the alleys, and the planting being performed, it is again spread over the surface. The depth to which the soil is drawn off, must be determined by what the seed or roots to be planted require. Bulbous roots, and large seeds, are frequently thus planted.

7. *Furrow Planting* consists in the use of the plough and the harrow, and is only employed when large tracts of ground are employed for one kind of produce.

8. *Dibbling.* The principal difference between the dibbling of the gardener and that of the agriculturist, is, that the former does not close the earth by the subsequent use of the harrow, but uses his dibble, or setting-stick, to press it together, and fix the plants as he proceeds. Herbaceous, shrubby, and fibrous-rooted plants, are very commonly set in this manner, as well as a great number of seeds.

9. *Trowel Planting.* This is easily and expeditiously performed with a garden trowel, which serves both to take up the plant, and to make the hole for its reception. A quantity of earth is usually taken up along with the plant, and a little water is used to render it less liable to droop.

10. *Planting with balls of earth about the roots.* This practice consists in the removal of a plant or tree with as much as possible of the soil adhering to its roots. It is employed for all tender plants, and for the most hardy when they are transplanted at a season improper for the operation, as in summer.

11. *Planting in pots.* Garden pots should be very little larger than what the plants require at the time they are put into them, and should be changed as the plants increase in size. They should have the hole at the bottom covered by a potsherd, or oyster-shell, and when the plants are first set in them, which is generally done with more or less earth about them, the whole of the vacant space, while the plants are held upright, should be filled up with fine mould, and a watering immediately given. In removing a plant from a small pot to a larger, the whole of the earth is generally taken up entire, and placed in the large pot, upon a bed of earth laid at the bottom of that pot, and which is enough to raise the surface of the old mould very nearly to the level it is to retain. The vacant space round the sides must then be filled up with fine mould: the plant will by this means scarcely receive the slightest interruption in its growth, and the fresh earth will in a short time cause it to be more luxuriant. If a plant appear to be diseased before it is transplanted, the whole of the earth should be taken from its roots, which should be examined, and any part found to be unsound should be cut off; and as there has probably been some fault in the earth, it will be proper to use none but fresh. The mould of potted plants should be occasionally stirred up, to the depth of an inch or two, and should be watered sufficiently often to prevent its getting dry.

Directions for the Flower Garden.

Flowers are classed into *annuals*, *biennials*, and *perennials*. The first, are those that are sown, and flower, and generally die, within the year. The second, are those sown one year, and which flower, and generally die, the next. The third, are those that do not flower the year they are sown, but the next, and continue to live years after, some fewer, some more.

Culture of Annuals. The middle of March is a good time to sow the *tender* sorts; of which the following are those usually cultivated in gardens: Amaranths, Balsams, Cockscombs, Egg-plants, Humble Plant, Ice Plant, Martynia, Scarlet Convolvulus, Sensitive Plant, Snake Melon, and Stramoniums. In order to succeed well, there should be provided fine, dry, and rich earth, good stable-dung, frames and lights, or hand-glasses, and mats to cover. A moderately-strong hot-bed, for a one-light frame, may be prepared, and, the heat being somewhat abated, the seeds should be sown thinly in drills, two or three inches asunder, on five or six inches of

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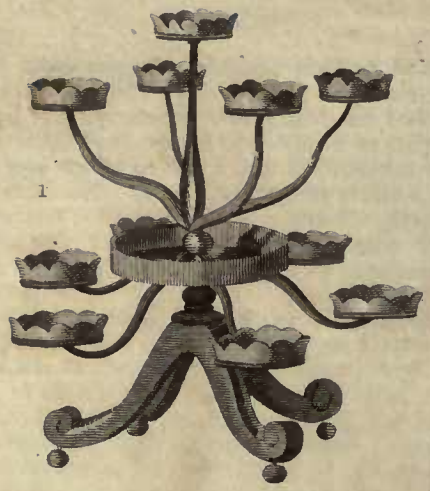
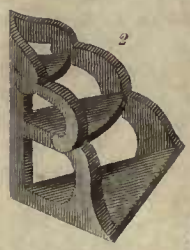
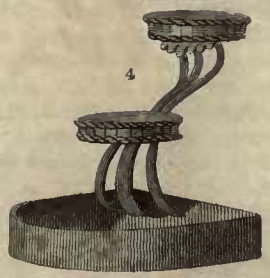
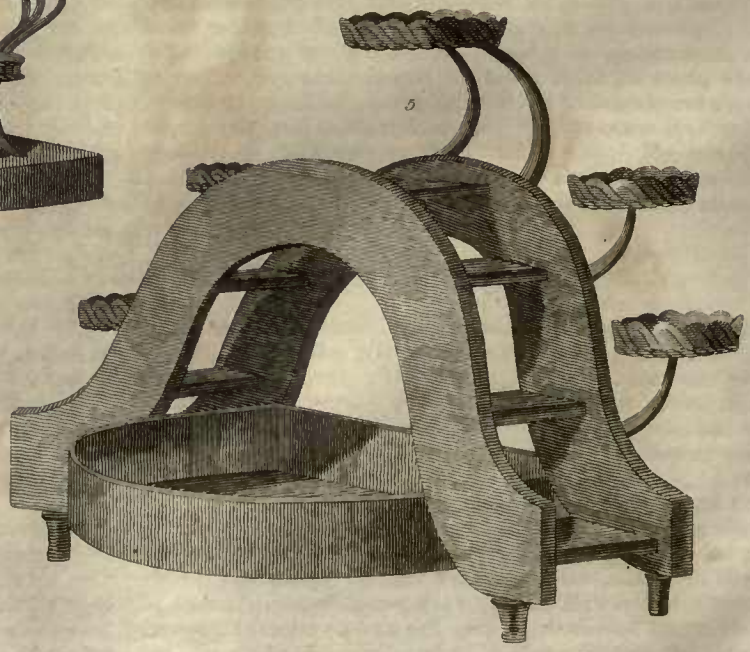
Improved Flower Stands.









W.M. Craig del. J. Davies Sc.

1. *To stand in the Middle of a Room.*—2. *For a Corner.*—3 & 4. *To stand against a Wall.*—5. *To stand in a Hall, or large Window.*
6. *To stand near a Window, or on the Landing of a Staircase, and correspond with the Candelabras; the Water being given to the uppermost Plant, will be distributed to all the others by Tubes in the Frame Work.*

Published by Henry Fisher, Caxton, London, 18??.

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Ornamental Gardening.

W. M. Craig del. R. Hicks sculp.

Designs for Classical Ornaments,
to display Flowers in Water, or in Pots, against
Walls, in Niches, or on Tables.

Published by Nuttall, Fisher & Dixon, Liverpool. 1817.

mould, or less on a weak bed; or sow in pots, plunged to the rims in earth. Cover the seeds from a quarter of an inch, or more, according to their size. Some of them will appear in a few days, and others will lie a fortnight or more, according to the circumstances of their nature, age, and the heat or moisture they meet with in the bed. Water, just warm, should be gently given them as they appear to need it; and air, as much as they can be thought to bear, a little at first, and by degrees more, for this is essential to their health and strength. Provide another bed within one month from the sowing, to set the plants out in; and, having six inches' depth of mould, place them five or six inches asunder, allotting those to the warmest part of the bed which were longest in coming up, which are of course the weakest; or they may be put out in small pots of five inches' diameter, the tallest being placed behind. If not sown till the beginning of April, this second bed may possibly do for the whole business, with proper management to keep up its heat by day, and by covering it well at night; but a third bed is commonly necessary; in order to bring the plants on forward and fine. In this second bed, it being covered over with four or five inches of mould, the plants should be in small pots, one in each, and plunged an inch deep, close to one another. As the beds get cooler, the pots are to be earthed higher, till up to the rims in mould; but, if planted without pots, the distance should be eight or nine inches asunder. As these tender annuals cannot bear the full open air till midsummer, give them as much of it as possible in the frames, by degrees, even taking off the glasses in the middle part of mild days. Keep up a heat in the third bed as long as can be, that the plants may continue in a growing state, and not get stunted by cold at bottom. It is hardly necessary to state, that the beds must be larger, and frames deeper, every time the plants are shifted. From the small pots, let them be transplanted into bigger in time, or into warm borders, where, if covered with hand-glasses set on bricks for a while, it will secure them from unkind weather, till they are got a little hardened. In this changeable climate, it is difficult to know when tender plants may be safely exposed; yet too much housing and covering is to be avoided as much as possible. Some of the tender flowers in pots may be plunged to the rims in the ground, to keep their roots cool, and for the sake of being conveniently covered; in which case, it is proper to put a bit of tile underneath to keep out the worms, which are apt to do great mischief. Good seeds from tender annuals cannot be well procured but from February-sown plants; which should begin to have protection by glass about mid-August, at least during the nights, till they are fully ripened in September.

The *less tender* annuals, viz. African Marigold, Basil, Blue Browalia, Cape Marigold, Capsicum, Chinese Aster, Chinese Hollyhock, Chinese or Indian Pink, Chrysanthemum, Convolvulus, French Marigold, Gourds, Lennia, Love-apple, Marvel of Peru, Mignonette, Nolana, Palma Christi, Persicaria, Stocks, Yellow Sultan, Tobacco, Tree Amaranthus, and Zinnia, require less care. These may have a slighter bed, about two feet thick, made for them at mid-March, or a little after, being sown and managed as directed for the tender sorts. When they are one or two inches high, they must be taken up with a ball of earth about their roots, and either transplanted on another bed, about one and a half foot thick of dung, or into the borders or ground; the small kinds at four or five, and the largest at six or eight inches asunder. Let them be watered and kept moist, and shaded from the sun till they are well settled. Spindle-rooted plants, as Stocks, &c. should be moved where they are to blow as young as may be; but fibrous-rooted ones may be shifted much older.

The *hardy annuals*, viz. Adonis, Agrostemma, Alysson, Amaranth, Amethystea, Moldavian Balm, Belvidere, Candytuft, Carthamus, Lobel's Catchfly, Caterpillar Trefoil, Red and White Clary, Convolvulus Major, Cornbottle, Spurting Cucumber, Yellow Fumitory, Hedgehog Trefoil, Honeywort, Indian Corn, Ketmia, Larkspur, Lavatera, Lupine, Mallow, Garden Marigold, Mignonette, Nasturtium, Nigella, Pansey or Heart's-ease, Sweet-scented Peas, Persicaria, Poppy, Saffower, Scarlet Bean, Starry Scabious, Stock July-flower, Strawberry Spinach, Sunflower, Tangier Pea, Venus's Looking-glass, and Xeranthemum, require the following treatment.—These may be sown from the middle to the end of March, as the best average season. But nature seems evidently to direct an autumn-sowing, for many sorts which are then shed come up at spring, and make the finest blow, and produce the best seed for propagation. A number, therefore, might be scattered on the ground at random, after being kept a little while to harden. A second, or even a third sowing of hardy annuals, may be made at two or three weeks apart, to continue the bloom, especially of those that come early, and are soon off. The middle of May is not too late. In short, of every flower that blows in summer, there may be three sowings, and two of those that come in autumn, in order to a full succession. But, as hardy annuals do not transplant well, they should be sown where they are to remain, and they must have a good soil in order to succeed. They require to be frequently watered in dry weather. A few choice sorts should be sown in pots, setting them where they have only the morning sun; and, when in flower, they will serve to put into any particular place or apartment for ornament.—The annexed Engravings of "Improved Flower Stands," will shew how such pots may be placed to the greatest advantage.

Biennials, among others, include the following varieties, viz. Canterbury Bell, China Pink, Ethiopian Colutea, Common Pink, French Honeysuckle, Globe Thistle, Hollyhock, Tree Mallow, Yellow Horned Poppy, Rocket, Scabious, Stock July-flower, Sweetwilliam, Tree Primrose, Vervain Mallow, and Wall-flower.—These are to be sown in drills, or in beds, at broadcast, the latter end of March or beginning of April, where they have only the morning sun, and the ground should be cool, or kept so by occasional waterings; the beginning of May, however, is not too late. Thin the young plants on the seed-beds soon after they appear, and keep them well weeded. They may either remain till autumn, to be planted out where they are to blow, or, if they grow too strong and crowding, let every other be drawn in summer, and planted out wider into nursery-beds, for use either in autumn or the following spring. The latter season will do for final planting, though the former is best, as the roots get established in the ground; because, if moved in the spring, they are apt to meet with a check. In severe winters, however, those moved in autumn are sometimes killed, and therefore a few may be reserved to spring; when, being moved with good balls of earth, they will not be much checked. A succession of biennials should be preserved by annual sowings.

Perennials. (Those marked thus†, are mostly propagated from seed.) Adonis, Alysson†, Anemone, Asphodel, Asters, Auricula, Bachelor's Button, Bean Caper, Bee Larkspur†, Bugloss, Campanula†, Campion, Carnation†, Cardinal Flower, Cassia, Columbine, Cowslip, Cranesbill, Crowfoot, Daffodil, Daisies, Dogtooth Violet, Dragons, Dropwort, Eternal-flower, Fennel-giant, Feverfew, Flax, Flower-de-luce, Foxglove†, Fraxinella, Fumitory, Garlic, Gentianella, Goldy Locks, Golden Rod, Greek Valerian, Hawkweed†, Hepatica, Herb Bennet, Hollyhock†, Houseleek, Lady's Mantle, Lady's Slipper, Lady's

Smock, Lily of the Valley, Lion's Tail, London Pride, Loosestrife, Lupine, Lychnidea, Madwort, Marsh Marigold, Meadow-sweet, Milfoil, Milk-Vetch, Mint, Moth-Mullein, Navelwort, Oxeye Daisy†, Everlasting Pea†, Peony, Pilewort, Pinks, Plantain, Polyanthus†, Primrose, Ragged Robin, Ranunculus, Reed, Rhubarb†, Saxifrage, Skullcap, Snap-dragon†, Sneezewort, Sidesaddle Flower, Soapwort, Solomon's Seal, Spiderwort, Spurge, Stonecrop, Sunflower, Swallow-wort, Thrift, Throatwort, Toadflax, Tradescanthia, True-love, Valerian, Vervain, Veronica, Violet, Viper's Bugloss, Wakerobin, and Willow-herb.—This class of flowers is propagated, many of them by their roots, according to their nature, as fibrous, bulbous, &c.; some by layers, suckers, offsets, slips, cuttings; and a few, such as we have already noticed, by seeds. All sorts bearing seed are occasionally propagated this way, for the purpose of producing new varieties, or to raise finer plants, as those from seed generally prove. The principal obstacle against raising from seed, is, that they are several years before they come to blow, as all bulbous and tuberous-rooted flowers are. The offsets, or parting of the roots, are planted in spring or autumn, taking care that each piece separated has some fibres of the root: this is usually done in September; and the slip of the root will itself flower the ensuing summer: if done in spring, it should precede the shooting of the stalks.

Bulbous and Tuberous-rooted Flowers, viz. Aconites, Amaryllis, Anemone, Asphodel, Bulbocodium, Colchicum, Cornflag, Crown Imperial, Cyclamen, Daffodil, Fritillaria, Fumitory, Hyacinth, Iris, Jonquil, Narcissus, Pancratiums, Polyanthus Narcissus, Ranunculus, Saffron, Sisyrinchium, Snowdrop, Squill, Star of Bethlehem, Tuberoses, and Tulips.—To raise these, they should be sown in boxes about three feet long, two wide, and six inches deep, filled with light rich earth, about the middle of August, or September, and setting them in a sunny sheltered place, under cover. Sowings may take place also in March or April, removing the boxes in May to a place where they may have only the morning sun. Thin them a little if they come up thick; and, when the stalks die, put on half an inch of fine fresh mould; and after the decay of the leaf next summer, they must be planted out in nursery-beds, two or three inches asunder, according to their nature; and some will blow the following year, as the Anemone and Ranunculus, &c. though the Hyacinth will be four or five, and the Tulip, seven or eight, first. These must be removed from the nursery-bed to another, as soon as their tops are decayed, and planted at six inches' distance; and ever after treated as blowing plants. Keep them very clear of weeds, particularly the seedlings; which protect in severe weather from frost, or heavy rain, by mats and hoops. These flowers are easily multiplied by offsets, which are small, but in other respects like the parent, whether that be bulbous or tuberous: the offsets should be separated from the main root at the time they are taken up, which should be done in dry weather. The general culture, is to take them up annually, soon after they have flowered; when their leaves and stalks turn yellow and decay, then the root is at rest, and its fibres die. When first taken up, lay them covered in dry earth for a few days, and clean and harden them in the sun; after which, they must be stored in a dry place till wanted: damp is apt to rot them. Autumn-flowering bulbs are to be taken up in May, if their leaves are decayed. Spring-flowering bulbs should be replanted in September and October; those of the summer in October or November; and those of autumn in July or August. The scaly bulbs, as Lilies, &c. should not be kept out of the ground above a month or six weeks. Those that flower in summer may be put in the ground at different times, as early and late in autumn, and early in the new year, but not later than February, to obtain a succession of bloom. If any are put in at the end of February, or beginning of March, they should remain two years for increase.

The soil that best suits bulbous and tuberous-rooted flowers, is a sandy loam; but most of the sorts are not very nice. The ground for them should, however, be well dug, that their fibres may shoot freely, and wet be completely drained from them, when much of it falls. This work should be done a week before planting, that the ground may settle. In a light soil, roots of the Ranunculus have been known to strike a yard deep, which may admonish, that in a clay bottom it is proper to lay a body of stones about eighteen inches deep, that too much moisture may not be detained to sicken the roots. The depth at which bulbs should be planted, must be according to their size, three or four inches deep, from their top. Tubers also according to their size; Anemones and Ranunculuses at two or two and a half inches, &c. Some bulbs will come up at even a foot below the ground, as Crown Imperials, &c. Their proper disposition is either in beds of from three or four feet and a half wide, for the curious sorts; or in patches, to form clusters of three, four, or five, agreeable to the room they require. There should be only one in a place of the White or Orange Lily, Crown Imperial, and such-like large bulbs. In beds, the fancy sorts of bulbs, and tubers, may be set in rows, eight or nine inches asunder, and from five to seven inches in the rows, according to their size. The distance of four inches apart is, however, by some florists, thought sufficient for Anemones and Ranunculuses; but more room is desirable where a strong bloom is required. Hyacinths should be planted at seven or eight, though they are more commonly set at six inches. Tulips should be at eight or nine, though six is often all that is allowed them. When planted, if rain does not come in about four or five days, the beds should be watered, to set them growing, that they may not mould or rot.

Of all flowers or flowering shrubs, the *Rose* seems to claim precedence. In its varieties it should be planted in all situations; but the Provence more particularly. To encourage them to bear in the latter part of the year, pulling off the first roses as soon as they begin to decay, is a mean; but to pull off all the buds, at the usual time of bloom, is a more certain method. A more sure way still, is to top the new shoots towards the end of May, or prune down to two or three eyes. Transplanting Roses in the spring, is a mean to effect a middle bloom; and, if in a north border, and cool ground, this may be done late in April, or even in May, watering, and, at the same time, pruning short. Early Roses are obtained by being trained against a south wall. The Monthly Rose thus planted, and having the light of a Cucumber frame put before it, will sometimes come as early as the end of April, or beginning of May. It is a good method to put moss round the roots of these trees in March, to keep the ground warm, and at the same time moist, which helps to produce both forward and large roses; in dry and hot situations they often require water. See the article *Rosa*.

The Kitchen Garden.

The following are the proper plants for a Kitchen Garden; directions for the culture of which will be found under their proper heads in the body of the work.—Angelica, Anise; Artichoke, of the Dutch or Globe, French, and Jerusalem sorts; Asparagus, Balm, Sweet Basil; Bean, Dwarf, French, Kidney, Lisbon, Long-podded, Mazagan, Red-blossomed, Sandwich, Spanish, White-blossomed, and Windsor sorts;

Green, Red, and White Beet; Borecole, Borage; Cauliflower; Early-purple and Late-purple Brocoli; Drum-headed, Imperial, Sea, Sugar-loaf, Scotch, and Turnip-rooted Cabbage; Cardoon, Carrot, Capsicum, Cauliflower; Common and Upright Celery; Chamomile, Chives, Chervil, Clary, Coriander, Corn-salad, Cress; Cucumber, the short green, early, long green, prickly, Dutch white, Roman, Turkey green, and white sorts; Dill; Elecampane; green curled, white, and Batavian Endive; Eschalot, Fennel, Garlic, Gourd, Horse-radish, Hyssop, Indian Cress, Kale, Lavender, Leek; Lettuce, the black coss, brown Dutch, early green cabbage, imperial, Silesian, green coss, and white coss sorts; Love apple; Annual Sweet, and Winter Perennial Sweet Marjoram; Marigold; Cautaleupe and Roman Melons; Pepper and Spear Mint; Mushroom; Black and White Mustard; Portugal, Spanish, Strasburgh, and Welsh Onion; Orach; Common, curled, and broad-leaved Parsley; Parsnep; Pea, the Charlton, golden, Reading hotspur, Spanish, green nonpareil, large and dwarf marrowfat, rouncival, egg, and sugar sorts; Pennyroyal; common and red Potatoe, as well as the common red, common early, kidney, and American sorts; the long-topped, short-topped, salmon, and white and black Spanish Radish; Rape; Rhubarb; Rocambole; Rosemary; Rue; Saffron; the common, red, broad-leafed, and narrow-leafed Sage; Salsafy; summer and winter Savory; Scorzonera; Skirret; common and French Sorrel; Spinach; Tansey; Tarragon; Thyme; the early Dutch, oblong, green, red, yellow, and white-rooted French Turnip; Water Cress, and Wormwood.

All the perennial *aromatics* are easily raised, either by slips, offsets, parting the roots, or by seed, and they may be planted in spring, summer, or autumn, in beds or borders, six to twelve inches asunder; but the annual and biennial kinds must be raised every year or two, from seeds sown in spring, in any compartment of common earth in the open ground, except the very tender sorts, such as Basil, which must be raised on hot-beds, to be transplanted out in May or June. Most of the others generally remain where they are sown in the natural ground, but they may be occasionally transplanted, the Sweet Marjoram and Summer Savory, in June, &c. and likewise the Angelica, as being of large growth, in summer. As some of these only afford their useful parts at particular seasons, as Mint, Balm, Pennyroyal, Tarragon, Sweet Marjoram, &c. they should be cut and preserved at such times for winter use, as about July and August; but autumn will be equally suitable for Marigold, Chamomile, Lavender, Sage-tops, Marjoram, and Hyssop, which often stand the winter. Parsley generally supplies green leaves all the winter; Basil and Dill only in summer. Chervil and Coriander principally in summer and autumn, of the spring and summer sowings. Anise and Angelica continue only in summer.

The Fruit Garden.

The following is a list of those Shrubs and Trees usually planted in the Fruit Garden; for the cultivation of which, reference is to be made under the proper heads in the body of the work.—Almond, the common, dwarf, Jordan, and white-flowered sorts; Apple, the common codling, June-eating, Margaret, Kentish, winter pearmain, scarlet summer, golden pippin and russet, redstreak, Kentish pippin, nonpareil, kitchen rennette, and quince sorts; black, stoneless, and white Barberry; Cherry, the common black, red Kentish, white-heart, red-heart, black-heart, Morello, Turkey, and Portugal sorts; common red and white, white grape, and black Currants; Damson; Fig; Gooseberry, the hairy red, smooth red damson, hairy green, smooth green, oval yellow, great and early amber, and common white sorts; various kinds of Grape; German, Nottingham, and Italian Medlar; Black Mulberry; Nectarine; Nut-tree; Peach; Summer Pears, as the musk, green chisel, red muscadel, jargonelle, Windsor, queen, orange, musk, and bergamotte sorts; Autumn Pears, as the autumn, Swiss, caraway, brown and white buerre, green sugar, and swan-egg sorts; Winter Pears, as the St. Germain, Chaumontelle, Colmar, Holland's bergamotte, Worcester black, and double-flowered sorts; Plums, as the damask, damson, green and blue gage, Orleans, perdigron, mogul, imperial, apricot, damascene, and bullace sorts; the Apple, Pear, and Portugal Quince; the common red, white, double-bearing, and Antwerp Raspberry; the Alpine, Chili, hautboy, and scarlet Strawberry; and the thin-shelled, thick-shelled, double, and common oval Walnut.

Directions for the *pruning* of Fruit-trees will be found at page 407 of this Volume. But the manner in which they should be *trained*, we introduce at this place. Mr. Knight has successfully adopted a method, in which a greater surface of leaf is exposed to the light, than in any of the ordinary modes, and which caused the growth of Peach-trees to be such, that at two years old they were fifteen feet wide. Beginning with plants a year old, he headed them down early in spring, and trained only two shoots from each stem, in opposite directions, and nearly horizontal, for they only rose at an elevation of five degrees; when he observed any difference in the vigour of the shoots, he depressed the strongest, or gave a greater elevation to the weakest, by which the uniformity of their growth was maintained, and in one summer they attained the length of four feet. The lateral shoots were pinched off at the first or second leaf, and were in the succeeding winter wholly destroyed. In the subsequent progress of this mode of training, the large space which would be enclosed by a semicircle resting upon the extremities of these nearly horizontal shoots, is gradually filled up by other shoots, which proceed divergently from them, until these new shoots attain an inclination of about thirty degrees, when, on the side next the centre of the tree, shoots nearly horizontal are trained from them. This mode of training has a neat appearance, besides being conducive to the health of the tree.

In addition to what has been given under *Vitis*, p. 757 of this Volume, on the cultivation of the GRAPE, the following, as being of considerable interest, is here introduced as the invention of Mr. Marsh, of Barnstaple. "The invention (says he) is a simple, cheap, and easy mode of raising Grapes, of a quality superior in flavour and perfection to any I have before met with." The building in which the Grape is produced is only four feet eight inches high in front, six feet and a half wide, and eight feet high at the back. "The front and end walls are built with brick, two feet high from the ground, and glazed in front two feet eight inches high, at each end, and on the top, like a common green-house. It fronts due south, to receive every advantage of the sun." At the end is the door. Running lengthways, on each side, are two beds of earth, two feet high, enclosed in a narrow brick wall, with a passage between them. "The back wall is plastered with mortar made of lime, smiths' cinders, and scales from the anvil, in equal parts. Those Vines which are set at the end of the Grapery are trained along the wall, and meet in the centre: the Grapery is twenty-two feet long; in which space, and at the ends, no less than ten Vines of different sorts are introduced through the wood-work on the wall, which projects for that purpose. Before the building was erected, I obtained all the information I could, from gentlemen of my

acquaintance who understood the management of Vines in France, Spain, Italy, Portugal, &c. from whom I learned, that the roots of the Vines should not be more than two feet six inches asunder, nor let to run high, and but little wood suffered to grow from each root. Observing these rules, I tried several experiments; and found the following method to be attended with singular success. Fill the two beds with rotten dung and garden earth; water the same when the sun appears the whole day, morning and evening, and so in proportion. The exhalation will supply every part of the Vine with nourishing warm water, as may be seen by examining the Vine; which appears to be one of the causes of producing the effect. In the beds, or earth-pits, Pine-apples, or any thing else, may be raised, to remain, or to be transplanted. In winter, remove the earth in the pits, place bricks on their edge, half way up from the bottom, each row three feet asunder; on the bricks place common plastering-laths on their edge; over which put some long litter taken from horse-dung, and put upon it the earth which was removed. Doors being made in the walls of the earth-pits, at the front of each partition, or six doors in each pit, put into each as much fermented horse-dung as it will hold; stop it up close with a wooden stopper, and let it remain six or eight days; then take it out, and repeat the same during the winter, or any time you please. The flavour of any fruit raised in beds so managed, is superior to what is raised in a hot-house, and fire is saved. To prevent the heat from being too great in the summer, put five squares of glass, separately framed, with an axis for each to turn on, one in each light. The air, by being rarified, will lift up the squares, and escape; after which, each square will shut again of itself, and maintain a regular heat without farther attention; but, when the sun is very intense, cold air may be admitted by sliding sashes, one at each end of the Grapery; but this will require attention, lest the grapery cool too fast. In frosty weather, it is necessary that the glass part of the Grapery should be covered with mats; and, as the buds of the Vines break early in the spring, it is also necessary to train the Vines so as not to touch the glass, lest the buds perish. When the Grapes are set, break off all superfluous shoots every second or third day; by which means you will have ripe Grapes in July, and the following eight months. One year I left some on the Vine to dry, and in March following I fund them equal to any jar-raisins imported. If these instructions are attentively observed, wine may be made in this country as rich, and of as good quality, as any imported. It will answer the purpose of every man who has a spot of ground, to build a Grapery, since no profit in horticulture will be superior to it. The whole of the expense of building my Grapery did not exceed 14*l.* and, when the Vines came into bearing, one year's produce, if sold, would have more than cleared all expenses; from which the profits may be easily calculated."

The following singular discovery has been communicated by J. Williams, Esq.—"It is a fact well known to gardeners, that Vines, when exposed in this climate to the open air, although trained to walls with southern aspects, and having every advantage of judicious culture, yet in the ordinary course of our seasons, ripen their fruit with difficulty. This remark, however, though true in general, admits of some exceptions, for I have occasionally seen trees of the common White Muscadine and Black-cluster Grapes, that have matured their fruit very well, and earlier by a fortnight or three weeks, than others of the same kinds apparently possessing similar advantages of soil and aspect. The Vines that ripened their fruit thus early, I have generally remarked were *old* trees, having trunks eight or ten feet high, before their bearing branches commenced. It occurred to me, that this disposition to ripen early, might be occasioned by the dryness and rigidity of the vessels of the old trunk, obstructing the circulation of that portion of the sap which is supposed to *descend* from the leaf. And, to prove whether or not my conjectures were correct, I made incisions through the bark on the trunks of several Vines, removing a circle of bark from each, and thus leaving the naked alburnum above an inch in width completely exposed; this was done in the months of June and July. The following autumn, the fruit growing on those trees came to great perfection, having ripened from a fortnight to three weeks earlier than usual; but in the succeeding spring the Vines did not shoot with their accustomed vigour, and I found that I had injured them by exposing the alburnum unnecessarily. In 1807 these experiments were repeated. At the end of July and beginning of August, I took annular excisions of bark from the trunks of several of my Vines; and, that the exposed alburnum might be again covered with new bark by the end of autumn, the removed circles were made rather less than a quarter of an inch in width. Two Vines of the White Frontiniac, in similar states of growth, being trained near to each other on a south wall, were selected for trial; on one of these the experiment was made; the other was left in its natural state, to form a standard of comparison. When the circle of bark had been removed about a fortnight, the berries on the experimented tree began evidently to swell faster than those on the other, and by the beginning of September shewed indications of approaching ripeness, while the fruit on the unexperimented tree remained green and small. In the beginning of October, the fruit on the tree that had the bark removed from it, was quite ripe, the other only beginning to shew a disposition to ripen, and the bunches were shortly afterwards destroyed by the autumnal frosts. In every case in which circles of bark were removed, I invariably found that the fruit not only ripened earlier, but the berries were considerably larger than usual, and more highly flavoured. The effect thus produced, I can account for only by adopting Mr. Knight's theory of the *downward* circulation of the sap, the truth of which these experiments tend strongly to confirm. I therefore imagine, by cutting through the cortex and liber, without wounding the alburnum, that the descent of that portion of the sap which has undergone preparation in the leaf, is obstructed, and confined in the branches situated *above* the incision; consequently the fruit is better nourished, and its maturation hastened. It is certainly a considerable point gained in the culture of the Vine, to be able to bring the fruit to perfection by a process so simple, and so easily performed.—But, lest there should be any misconception in the foregoing statement, I will briefly describe the exact method to be followed by any person who may be desirous of trying this mode of ripening Grapes. The best time for performing the operation on Vines growing in the open air, is towards the end of July or beginning of Augusr; and it is a material point, not to let the removed circle of bark be too wide; from one to two eighths of an inch will be a space of sufficient width; the exposed alburnum will then be covered again with new bark before the following winter, so that there will be no danger of injuring the future health of the tree. It is not of much consequence in what part of the tree the excision is made; but, in case the trunk is very large, I should then recommend, that the circles be made in the smaller branches. It is to be observed, that all shoots which come out from the root of the Vine, or from the front of the trunk situated below the incision, must be removed as often as they appear; unless bearing-wood is particularly wanted to fill up the lower part

of the wall, in which case one or two shoots may be left. vines growing in hot-houses are equally improved in point of size and flavour, as well as made to ripen earlier, by taking away circles of bark; the time for doing this, is when the fruit is set, and the berries are about the size of small shot. The removed circles may here be made wider than on Vines growing in the open air, as the bark is sooner renewed by the warmth and moisture of the hot-house. Half an inch will not be too great a width to take off in a circle from a vigorous growing Vine; but I do not recommend the operation to be performed at all weak trees.—I think that this operation may be extended to other fruits, so as to hasten their muturity, especially Figs, in which there is a most abundant flow of returning sap; and it demonstrates to us why old trees are more disposed to bear fruit than young ones. Miller informs us, that the vineyards in Italy are thought to improve every year by age, till they are fifty years old. It therefore appears to me, that nature, in the course of time, produces effects similar to what I have recommended to be done by art. For, as trees become old, the returning vessels do not convey the sap into the roots with the same facility they did when young; thus, by occasionally removing circles of bark, we only anticipate the progress of nature; in both cases a stagnation of the true sap is obtained in the fruiting-branches, and the redundant nutriment then passes into the fruit. I have sometimes found, that, after the circle of bark has been removed, a small portion of the inner bark has adhered to the alburnum; it is of the utmost importance to remove this, though ever so small, otherwise, in a very short space of time, the communication is again established with the root, and little or no effect produced. Therefore, in about ten days after the first operation has been performed, I generally look at the part from whence the bark was removed, and separate any small portion which may have escaped the knife the first time."

Flowering Shrubs and Evergreens.

To these we are indebted for much of the beauty and elegance of our gardens; and hence they justly merit every care, though they produce little or no edible fruits. They assist in forming an agreeable shade, they afford a great variety of flowers, with leaves differently tinged, and are standard ornaments, that give us pleasure without occasioning much trouble.—Many shrubs are raised from suckers, others from layers, some from cuttings, and most may be propagated from seeds, which produce the finest plants. Before they are planted out for ornament, they should be trained two or three years in a nursery, to be formed into a full and regular-shaped head. Though deciduous shrubs may be planted almost at any time, yet October is much the best month, especially if a moist season; the exception being made as to a cold and wet soil, in which all sorts of planting is best done in spring. Evergreens must be cautiously planted, and they should not be ventured upon in winter; nor even in autumn and spring, in unfavourable weather. They should be planted immediately after they are taken up, exposing their roots as little as possible to the air, and preserving them whole. If the shrubs are small, let them be removed with balls of earth to them, trimming off the projecting ends. As spring is, on the whole, the fittest time for removing evergreen shrubs, and as the deciduous sorts do then also very well, shrubberies and clumps properly enough become the work of March, a little earlier or later, according to the soil and season. Light sandy soils should always be planted in good time, and in fair weather. A good medium way is to plant the deciduous sorts the beginning of March; and, leaving places for the evergreen kinds, plant them the beginning of April. The distances of the plants must be according to the size they usually attain. Some sorts will not require more than three feet distance, others four, five, or six. The season of shrubs flowering and leafing, is a material point to provide for, by a proper distribution, that there may be a difference of decoration every month, in every part; and in this business, an equally-diversified mixture of the evergreen and deciduous sorts, is necessary to be observed. A regularity in planting shrubs is ever to be avoided, except just in the front, where there should always be some low ones, and a border of flowers, chiefly of the spring kinds, of the lowest growth, and rather bulbous-rooted. In open shrubberies, an edging of Strawberries is proper, and the hautboy sort preferable, on account of its superior show when in flower; but in these situations the Wood Strawberry is more commonly planted, as it will produce fruit with less sun and air than any other sort.

The copious catalogue of Trees and Shrubs (see page 855) will enable the gardener or planter to select such as may be most proper for particular or general purposes. And for a particular description of all known flowers, flowering shrubs, aromatic herbs, &c. with their mode of cultivation, see under their generic names in the first and second volumes.

THE GARDENER'S CALENDAR, OR MONTHLY COURSE OF LABOUR.

FIRST MONTH.—JANUARY.

In the Flower Garden and Shrubbery.—Plant Crocuses, Tulips, Snowdrops, and other bulbous roots. Plant flowering shrubs, and Box and other edgings: prune flowering shrubs, taking care to remove their suckers. Protect Tulips, Hyacinths, and other delicate flowers, from cold weather and heavy rains, by coverings of litter or mats. Plant hedges and ornamental trees. In open weather, dig over the shrubbery, and remove moss.

In the Kitchen Garden.—Prepare hot-beds for early Melons, Cucumbers, Onions, Cresses, Mustard, and Radishes. Cover Mushroom beds with straw, heath, &c. particularly during frost. Plant Asparagus in hot-beds, and give it air, except in stormy weather. Sow Peas, Beans, Carrots, Cabbage-lettuces, and curled Parsley. Provide for the succession of Peas and Beans, by sowing at intervals of a fortnight. Sow Spinach; earth up Celery and Broccoli. Pick the decayed leaves from Cauliflowers standing under glasses, and give them air at mid-day if the sun shines. In frosty weather, when other work is hindered, wheel in dung, examine trees for the nests of caterpillars, and seek out the harbours of snails and other vermin.

In the Fruit Garden.—Loosen espalier and wall fruit-trees, and in open weather prune Apple, Pear, and Quince trees; Vines, Gooseberries, Currants, and Raspberries; removing all cankered and decayed branches, and scraping off moss with a blunt iron tool. If the weather be very cold, spread rotten dung or straw, or the refuse of flax, over the roots of the trees, not immediately at the bottom of the trunk, but principally over the small roots at a distance; for the roots of trees generally extend as far as their branches. Plant new Strawberry beds; prepare hot-beds for raising the

early scarlet Strawberry. Cut grafts before the buds become large.

In the Green-house.—Both in frosty and damp or foggy weather, employ small fires. During the warmest part of every fine day, open the sashes, in order that the air in the house may be kept constantly sweet. Be extremely sparing in the use of water; Aloes, and other succulent plants, will require none. The water should have acquired the temperature of the house before it is used. Fumigate occasionally with tobacco smoke.

In the Hot-house. Carefully regulate the fires, according to the state of the weather. The temperature of the house, during the night, to be kept about 55 degrees of Fahrenheit, and in the middle of the day it should rise to about 70 degrees. Admit fresh air every day. Remove all insects that can be found, particularly examining for them the blossoms of fruit-trees. Roses and other flowers will frequently require water, but fruit-trees in blossom only seldom, and little at a time.

In the Nursery.—Repair the fences, to keep out rabbits, hares, and other animals, which are at this time very destructive, from the scarcity of food. Transplant and prune forest-trees and flowering shrubs. Trench the ground for sowing seeds in spring: make plantations of stocks for budding and grafting upon. Gather and carry away the moss, wherever it appears.

SECOND MONTH.—FEBRUARY.

Flower Garden and Shrubbery.—Finish the planting of Box and other edgings. Lay down turf where it is required, and in order to prevent the grass from becoming rank, if brought from a poor to a rich soil, place under it a layer of sand. Bulbous and tuberous-rooted flowers may still be planted, but will in general be weaker than if planted in the fall of the year. Dig over and manure the soil of the shrubbery, and finish the pruning of the shrubs. Transplant perennial flowers; sow tender annuals in hot-beds, and prepare the ground for sowing hardy annuals. Continue to cover beds of valuable flowers with mats as in last month, taking off the mats in the middle of the day. Sweep off the moss from gravel walks with a stiff broom.

Kitchen Garden.—Sow Melons, Cresses, Mustard, Radishes, and Celery. Put the Cucumbers three days old into small pots, one for each plant, and put the pots up to the rim in a hot-bed. Continue to sow Peas, Beans, Carrots, Cabbages, Savoys, and Lettuces. Examine the Cauliflowers and Lettuces under glasses. Earth up the Beans and Peas of last month's sowing. Plant Garlic, Rocambole, Chives, Eschalots, Scorzonera, Salsafy, Borage, Angelica, Marigold, curled Parsley, Potatoes, and Jerusalem Artichokes. Plant Horse-radish by cuttings; and at the end of the month, plant the last crop of Asparagus for forcing. If the heat of any of the hot-beds appears to decline too much, remove a part of the dung round the sides, and apply a quantity of fresh.

Fruit Garden.—Prune and nail up Vines, Peaches, Nectarines, and other stone-fruit trees. Transplant fruit-trees of all sorts. Plant cuttings of Gooseberries and Currants. Give air to Strawberries on hot-beds. Graft Apples, Pears, Plums, and Cherries. If gum or symptoms of canker appear, cut out the infected part.

Green-house.—As mild weather occurs or approaches, admit more or less fresh air during the day. Dissipate the damp of foggy weather, and ward off the effects of frost, by small fires. The Aloe will still require no water; plants of a less succulent nature will require a little; and others, in proportion as they approach to a hard or ligneous texture, will require the quantity of water to be increased. Frequent waterings are better than few and copious ones. Remove all decayed leaves. Remove the earth of pots to the depth of an inch, and supply its place by fresh mould.

Hot-house.—Let the temperature be about 55 degrees during the night, and 75 or 80 degrees during the middle of the day. Thin the bunches of grapes; eradicate decayed leaves and insects. Take care to keep the air in a wholesome state. Frequently water Pines, stir up the old bark, and mix with it some fresh, if there be a decay of its heat. Fumigate to destroy insects.

Nursery.—Plant Acorns, Beech-mast, and other seeds, &c. of shrubs and forest-trees: cut down seedling Chestnuts of one year old to the ground: head down grafted and budded stocks; plant cuttings, suckers, and layers in general.

THIRD MONTH.—MARCH.

Flower Garden and Shrubbery.—Give a covering of fresh earth to plants in pots, first removing a layer of the old earth. Roll gravel walks:—finish the planting of deciduous shrubs, and perennial flowers, and continue to sow annual flowers, to maintain a succession of them. Tender annuals, sown in pots, will require a gentle hot-bed, to hasten their time of flowering. Sedulously weed the flower borders. Plant evergreens with balls of earth. Plant Carnation layers in pots. Shelter tender flowers from heavy rain or sleet. Finish the laying of Turf, and at the end of the month mow the Grass.

Kitchen Garden.—Sow the general crop of Lettuces, Parsneps, and Carrots. Continue to sow Peas and Beans at intervals. Sow Spinach and Cabbage seed, Celery, and early Turnips. Make fresh plantations of Asparagus, between the rows of which sow Onions. Remove the hand-glasses from Cauliflowers, and earth them up. Sow Salading, Parsley, Horse-radish, Thyme, and aromatic and physical herbs in general. Plant Leeks and Endive for seed. Surround the hot-beds of Melons and Cucumbers with a thick lining of fresh dung, or remove them to fresh beds. Kidney-beans, Jerusalem Artichokes, Tomatoe, Mushrooms, and Capsicums, must not be forgotten.

Fruit Garden.—The blossoms of the Peach, Nectarine, and Apricot, must be protected from dry and cold winds in the night, by placing hurdles before them, or spreading old fishing nets over them, or covering them with mats. Plant and prune; graft the various kinds of stocks; shorten the shoots from the grafts of last year, and take off the heads of the budded stocks of the same age. Dress Strawberry beds, and water them, especially those on hot-beds; place wisps of straw on the ground to support the leaves, and remove all runners, unless it is intended to prepare for a new plantation of them in autumn. Hoe the soil where the Currants and Gooseberries are planted.

Green-house.—Trim Myrtles, Orange-trees, Lemon-trees, and other shrubs, to the form required. Open the sashes during the warmest part of all fine days. Frequent waterings will be required; and the washing of the plants with water is beneficial. Exclude the frost; for which purpose, at nights, a small fire will be necessary. Sow the seeds of green-house plants in hot-beds.

Hot-house.—Thin the leaves and shoots of the Vine. Admit fresh air during the middle of fine days. To maintain the heat in a regular manner, is of great consequence to the Pines, which will now begin to shew fruit. The temperature in the morning should be 60 degrees, and in the course of the day, should rise to 75 or 80 degrees.

Daily remove weeds, decayed leaves, and insects, and water the plants and hot flues.

Nursery.—Plant the layers and cuttings of deciduous trees and shrubs, and sow the seeds of the same kinds. Trench the ground intended to be sown with seeds. Perform the grafting required. Transplant the Poplars raised from cuttings to moist ground. Seed-beds require watering, if the weather be very dry: or else the earth should be kept moist with branches of Fern, Furze, Yew, or Fir, kept spread over it till rain occurs.

FOURTH MONTH.—APRIL.

Flower Garden and Shrubbery.—Finish the rolling of gravel walks, as also the repairing, rolling, and mowing, of grass lawns and walks. Finish the planting of perennials and biennials, and still continue the sowing of annuals. Weed the flower borders. Stir up and dress the soil of flowers and shrubs in pots. Finish the planting of evergreens and shrubs. Clip Box and other edgings; support the tall-growing herbaceous or flowering plants with sticks. Protect Auriculas, Tulips, and other delicate flowers, from heavy rain, high winds, and strong sunshine; for this purpose, an arch should be made of hoops, to support the mats, or other covering. Carnations and Polyanthuses may yet be sown, and edgings may yet be planted, but the latter will occasion some trouble in watering, if the weather prove dry.

Kitchen Garden.—As soon as the last sown Peas and Beans appear above ground, sow again to keep up the succession. Continue to sow Radishes, Spinach, Cresses, Mustard, Broccoli, and Lettuces, and Cardoons to transplant. Draw the earth up to Cabbages, Cauliflowers, and the Peas and Beans sown early last month. Sow Kidney-beans. Finish the planting of aromatic and medicinal herbs. Sow more Turnips, Scorzonera, Salsafy, Celery, and Parsley. Weed the beds of Onions, Lettuces, Carrots, and Leeks. After rain, look out for snails and slugs, or turn in some ducks for a short time, and they will perform the business without injuring the vegetables. Pinch off the ends of Melons which have two or three joints, to cause them to throw out runners. Take off the young shoots of Artichokes, and the tops of Beans in flower. Never suffer Melons and Cucumbers to flower near together, as they are plants of the same genus, and would cause each other to degenerate.

Fruit Garden.—Finish planting and pruning. Examine budded and grafted trees, to take off all the shoots proceeding from the stock, and close the fissures observed in the grafting clay. Water frequently, in case the weather be dry. If any trees are blighted, mix hog's dung with the soil as far as the roots extend, and water freely. Thin the fruit of Apricots. Search diligently for caterpillars, of which numbers will now be found crowded together, and if the work of destroying them be delayed, they will soon spread over the trees. Weed the Strawberry beds. Plant cuttings of Vines.

Green-house.—Give air, and water freely. Set Geraniums very near the window. Remove Myrtles and the hardiest kinds of green-house plants, to warm situations in the open air. Inoculate Orange and Lemon trees. Remove the moss from the mould of plants in pots.

Hot-house.—Regularly train the Vines, and thin the leaves where they would shade the fruit. Water Pine-apples frequently. Admit air every fine day. Have fires during the night, and on damp gloomy days. Plant seeds, cuttings, layers, and suckers, of all the stove-plants to be propagated.

Nursery.—Sow the seeds of Larches, Firs, and Pines, and transplant seedlings of these kinds. Hoe the Chestnut ground, and water all trees and shrubs, if the weather be dry. Sow the seeds of Roses, Sweet-briar, and tender trees and shrubs in general.

FIFTH MONTH.—MAY.

Flower Garden and Shrubbery.—Take up all bulbous roots of which the leaves are withered. Put Auriculas which have flowered into fresh pots, and set them in the shade, but not under the drip of trees. Trim Carnations, and stake them. Remove Balsams, Egg-plants, Sensitive plants, and other tender annuals, to a fresh hot-bed. Mignonette, and all the less tender annuals, may now be planted out in patches on the flower borders, and the seeds of hardy annuals and biennials may be sown, to keep up the succession. When there is a probability of rain, transplant perennials from the seed-beds. Carefully attend to Rose-trees, to free them from insects: fumigations of tobacco, or water in which tobacco has been steeped, will destroy all the soft green insects. Plant tuberoses from blowing in autumn: water newly-planted shrubs; and never suffer a weed to flower.

Kitchen Garden.—Give air to the hot-beds during the day; but keep up the heat of those containing Cucumbers and Melons, by fresh linings of litter. Place tiles under the Melons as they set, to prevent the moisture of the bed from staining the fruit. Earth up Peas and Beans, and cut the tops off the latter, when in flower. Prick out Celery, sow the large sorts of Kidney-beans, and continue to sow the common kind, and Peas. Sow Cresses and Mustard, thinly, for seed. Plant out Capsicums for pickling. Transplant Cabbages and Savoys for winter. Transplant Lettuces, and sow more seed. Select some of the finest Radishes for seed. Thin Cardoons; hoe Onions, Carrots, Parsneps, and Turnips. Sow Beets, and the principal crop of Broccoli. Plant out Cucumbers, which, when trained against a south wall, have a finer flavour than when suffered to creep along the ground. Thin the first crop, and sow the second of Endive. Propagate aromatic herbs, by slips or cuttings. In dry weather, frequent watering will be required.

Fruit Garden.—Pull off all buds which appear in improper places; thin Apricots for the second time, and Nectarines and Peaches for the first time. Search for snails and caterpillars, pinch curled leaves, and fumigate where it appears necessary. Take off the clay from grafts perfectly united to the stock. Prune Fig-trees, if not done last month. Weed and dress Strawberry beds. A liberal supply of water will be required in dry weather.

Green-house.—Inure the plants to a free circulation of air; water frequently. Finish sowing green-house plants. Propagate by layers and cuttings. Remove to larger pots or tubs, the plants which require it, and towards the end of the month, if the season be mild, set in the open air the remainder of the plants which are esteemed moderately hardy.

Hot-house.—Pines will require much attention; water them frequently; if the heat of the bark decline, put some fresh into the bins. Make fires in damp weather, and at night, unless in a very mild season. Propagate stove exotics by seeds, cuttings, layers, and suckers. Let the temperature of all the water used be equal to that of the house, and give air occasionally.

Nursery.—Dress the seedling beds, and remove weeds, which will now grow rapidly, and prove very injurious if allowed to remain. Water frequently. Dig over the ground of new hedges. Arch the beds with hoops, to support mats

for covering seedlings during the hottest part of the day, when the sun is powerful.

SIXTH MONTH.—JUNE.

Flower Garden and Shrubbery.—Attend to bulbous roots which require taking up. When taken up, they must not be crowded together in earthen or iron pots, where they will mildew, but after lying a few days on mats or a dry boarded floor, they should be put into drawers, or hung up in paper bags, in a dry apartment. Plant out annuals from hot-beds, in wet weather if possible, to spare the trouble of watering. Transplant seedling perennials. Clip Box and other edgings, and evergreens in general, in moist weather. After trimming the shrubs, hoe the ground. Cut down and remove the stalks of perennials which have done flowering. Weed and roll gravel walks, and mow the grass of lawns. Sow annuals to flower in autumn. Increase Carnations and Pinks by layers or cuttings. Plant bulbous roots, which are to blow in autumn. Stake and tie up flowering plants that spread too widely.

Kitchen Garden.—Sow Beans, and hotspur and dwarf marrowfat Peas, in moist ground; and if the weather be dry, prepare the seed by steeping it in water for six or eight hours. Plant out the Melons raised in pots for hand-glasses; cover with mats those in frames during the hottest part of the day. Nail up the runners of Cucumbers trained against walls. Sow Lettuces and Endive for autumn, and sow purple and Cauliflower Broccoli for winter's use, four times, at intervals of three weeks or a month. Make the last sowing of Savoys, and prick out Broccoli, Cabbages, Cauliflowers, and Celery. Hoe and set out to their proper distances, Turnips, Onions, Carrots, and Parsneps. Increase Marjoram, Thyme, and other aromatic and pot herbs, by slips, and gather before they flower those of which the leaves only are required. Dress the Asparagus beds. Sow Rape and Cole seed. Water freely.

Fruit Garden.—Cut off all the superfluous shoots of espaliers and wall-fruit trees, and train the shoots reserved to their proper distances; taking care that the nails never touch the fruit, or hinder it from swelling. Thin the fruit-branches and leaves of Apricots for the last time. Bud stone-fruit trees. Destroy insects. Rub off the useless buds of the Vine, removing always the weakest. Water the blighted and newly-planted trees, and Strawberries in flower; clear the Strawberries from suckers. To have Strawberries in autumn, cut off the heads of those just beginning to flower.

Green-house.—Admit air very freely, and, if the season be not very backward, leave the sashes open all night. All but the most delicate green-house plants may be set out; Oranges and Lemons may be inarched; these trees are frequently kept in the green-house the whole year, to screen them better from the effects of changeable weather. Propagate by cuttings and layers. The cuttings of succulent plants should be allowed a week or two to dry before they are planted. Cover the surface of pots with fresh soil every month, removing a layer of the old for that purpose, and stir it up occasionally in the intervals.

Hot-house.—Maintain a high temperature, which will in the sunshine at noon generally rise to 95 degrees, if in the morning it is above 60 degrees. To make the liberal admission of fresh air comport with this heat, fires will occasionally be necessary. Water frequently, with water at the temperature of the house. Train the shoots of the Vines required for next year's fruit.

Nursery.—Weed the young stocks designed for grafting, and remove from them suckers and moss. Examine and weed the beds of seedlings and quicks. Inoculate Roses, Apricots, Peaches, and Nectarines; examine last year's grafts; transplant seedling Pines and Firs. Water frequently, if the weather be dry.

SEVENTH MONTH.—JULY.

Flower Garden and Shrubbery.—Transplant the seedling Auriculas and Polyanthuses, and the first layers of Pinks and Carnations; transplant seedling perennials into nursery beds, as they become too thick. Plant cuttings of scarlet Lychnis, Sweetwilliams, Pinks, and Rockets, in a shady border, and keep them covered with glasses, till they have grown two or three inches. Remove the glasses over Balsams, Egg-plants, and other tender annuals, and put fresh earth on the top of each pot. Take up Lilies, Crown Imperials, &c. to separate offsets. Transplant seedling bulbs of two years' old, which have not yet been removed. Gather seeds as they become ripe. Bud Roses, variegated Hollies, and Jasmines. Transplant evergreens; water frequently the Myrtles placed against walls. Hoe and dress more or less daily.

Kitchen Garden.—Plant the principal crop of Cabbages and Endive, and the last crop of Kidney-beans; transplant the second crop of Savoys, and the first of Broccoli, and prick out the second crop of Broccoli from the seed-beds. Thin the Cauliflowers sown in May, and pricked out the last month, by transplanting about half of them. Take up Garlic, Eschalots, Rocambole, and Onions, when their leaves are withered. Sow Lettuces and Carrots for autumn. Earth up Capsicums, the Cucumbers sown last month, and the first crop of Celery. Sow Turnips on a moist bed. Pull off the side shoots of Artichokes. Shelter Melons with glasses from the heat of the sun in the middle of the day, giving them but little water while ripening, but stirring the soil about them, and destroying weeds. Sow Peas for a late crop, also Spinach in small quantities at a time, as it quickly runs up to seed. Gather flowers and leaves for drying and distilling.

Fruit Garden.—Peaches, Nectarines, Fig-trees, Pears, Cherries, and Plums, must be inspected once a week, to nail up the shoots for next year's fruit, and remove whatever is superfluous. Stirring up the soil will refresh these trees, and mixing with it hog's dung will be serviceable, if blight is observed. Bud stone-fruit trees. Great numbers of ants, wasps, and other insects, may be destroyed by hanging up bottles half filled with sugar and water, but this must be done before the fruit is ripe, or it will not be fully effective. Take off the runners of Strawberries, when they are not required for a new plantation. The ripening of Currants may be protracted for two months, by a covering of mats. Search for snails and slugs in the evening, after rain.

Green-house.—Weed and dress more or loss daily, taking off all shoots that detract from the neat appearance of the plants. Aloes and other succulent plants may be set in the open air. As the green-house will now be nearly empty, it may in part be replenished, by bringing from the hot-house such flowers and shrubs as will either be benefited or not injured by a fresher and cooler air. Aloes and other succulents may be propagated by slips; Oranges and Lemons may be budded, and the fruit of those which bear may be thinned. Watering will be frequently required, especially by fruit-bearing trees. Paint and whitewash the green-house.

Hot-house.—Admit air freely during the day, and also during the night, unless the weather be gloomy and cold, in which case the Pines will require the assistance of a little fire. Take care that the heat of the bark be well main-

tained, but not violent, or it will scorch the roots. If the bark decline in heat, stir it up, sprinkle it with a little water, and let the pots be covered to the rim; if it become too hot, draw up the pots about one-third of their depth. Water the whole of the leaves and fruit of the plants, with water at the temperature of the house.

Nursery.—In moist weather, clip young hedges, and transplant the seedling Firs and evergreens that are too crowded, instantly putting them into the earth again. Clear away weeds in every part, and remove suckers from the various kinds of Stocks. Examine grafts, and bud stone-fruit trees, and flowering shrubs, unless the weather be very dry.

EIGHTH MONTH.—AUGUST.

Flower Garden and Shrubbery.—Plants in pots require frequent watering, particularly hot-bed annuals, such as Balsams, Egg-plants, and Cockscombs, which are about to perfect their seeds. Plant Mignonette in pots to flower in winter, and set the pots in front of a south wall. Put Auriculas into fresh pots, in a light soil mixed with well-rotted dung: prick out seedling Auriculas and Polyanthuses, leaving them at the distance of three or four inches; sow fresh seeds of these flowers in boxes, and sift a quarter of an inch of earth over them. Early in the month, plant the bulbous roots that flower in autumn. Take up Lilies, Crown Imperials, and other bulbous roots that have done flowering, before they throw out fresh fibres. Increase Carnations by layers, and perennials and shrubs in general, by slips. At the end of the month, sow hardy annuals, and they will produce stronger plants than if sown in spring. Mow grass walks and lawns; weed and roll gravel walks. Continue to gather ripened seeds. Trim evergreens, edgings, and shrubs in general.

Kitchen Garden.—Sow Cabbages, Carrots, and Corn-salad or Lamb's-lettuce. Dress the Asparagus beds. Transplant Celery. Plant out Cauliflowers and Turnips. Earth up Cardoons, Celery, Broccoli, and Savoys. Sow Angelica, Chervil, Scurvy-grass, Fennel, Radishes, also White Mustard, Cress, Endive, Rapeseed, and Lettuces. Gather Mushroom spawn, and keep it in a dry place till wanted. In wet weather protect Melons with glasses, or frames covered with oiled paper. Gather for pickling the Cucumbers trained against a wall. Sow the prickly Spinach, for winter's use, in a warm situation. Diligently pick the caterpillars from Cabbages. Take up Onions of which the tops are withering, and spread them out to dry, turning them occasionally. Sow the second crop of Welsh Onions. Gather seeds and aromatic and medicinal herbs.

Fruit Garden.—Take off superfluous shoots, and leaves that shade the fruit of espaliers and wall-trees. Nail up the shoots to be reserved: destroy insects; finish budding. Refresh the roots of the trees by raking and dressing the soil. Take off the runners of Strawberries. Cover the Currants, of which the ripening is to be protracted.

Green-house.—Remove the plants which require it into larger vessels, and renew the surface-soil of all the pots. Propagate Aloes and other succulent plants by offsets, of which each should have a small pot. Bud Orange and Lemon trees, and cut off from the parent stock, the branches of trees inarched in spring. The Myrtles and other woody kinds of green-house plants will require frequent but gentle waterings.

Hot-house.—The Pines will now be fast ripening; the heat of the bark must therefore be kept up: watering will be required, but it should be given most sparingly to those which are most nearly ripe. If it be required to keep back for a week or two, the ripening of a part of the Pines, let them be taken out of the hot-house into the green-house, or even into the open air, where they should be shaded from the sun, and not watered. Shift succession Pines into larger pots where they are to bear.

Nursery.—Trench and lay the ground in ridges as a preparation for the planting of next month; it will be benefited by an exposure to the air, sun, and dews. In dry weather, shrubs and seedlings will require watering. Remove weeds as fast as they appear. Examine the state of the grafted and budded trees, keeping the clay free from cracks, where it is still required, and removing it where it is no longer necessary. Trim evergreens, and transplant seedlings, watering them if there be no rain.

NINTH MONTH—SEPTEMBER.

Flower Garden and Shrubbery.—Prepare beds for Snowdrops, Crocuses, Jonquils, Tulips, Hyacinths, Anemones, and other bulbous roots, and plant them with a trowel in the course of the month, as they are weakened by remaining out longer. Plant out perennials, and finish for the year the sowing of all the hardy annuals. Put Mignonette in pots for the winter. Annuals which are ripening their seeds require frequent watering; Balsams, Egg-plants, and other tender sorts, will perfect their seeds best, if set in an alcove fronting the south, or in the green-house. Protect Auriculas from rain. Cut down the stalks of Carnations and other flowers which have flowered. Weed and roll gravel walks, and roll and mow grass lawns. In moist weather, plant Box for edgings, and plant cuttings of Laurels, Jasmines, and all other shrubs. Gather seeds in dry weather; be particularly attentive to the Radish seed, of which birds are very fond.

Kitchen Garden.—Plant out Endive, Cabbages, Coleworts, the Lettuces sown last month, and the last crop of Broccoli and Savoys; sow more Lettuce, Cabbage-seed, Chervil, and Corn-salad. If the Cauliflowers are backward, plant them on a slight hot-bed. Earth up the autumnal Cauliflowers; earth up Celery and Cardoons for blanching, first tying up each plant of the latter by itself with bass. Plant the offsets of Eschalots, Garlic, and Rocambole. Prepare Mushroom beds, under a shed open to the south, if convenient, for the sake of dryness; use fresh stable-dung; and cover the spawn with two inches of earth.

Fruit Garden.—Plant cuttings of Gooseberries and Currants, to keep up a succession of young trees, which bear the largest fruit. Plant Raspberries and Strawberries; the former continue in perfection only about four years, and the latter only two or three years. Nail up Fig-trees and Vines, and thin the leaves. Guard against insects; the branches of Grapes are frequently, for this purpose, put into bags of crape, gauze, or paper; hang nets before valuable fruit, to protect it from birds. Gather ripe fruit in the morning, before the sun becomes hot.

Green-house.—If Oranges, Lemons, and other delicate plants, particularly succulents, have been taken into the open air, for the two last hot months, they should be brought back; but the sashes may be left open all night, if the weather is seasonable. Water sparingly, and cease to water the leaves.

Hot-house.—The gathering of the fruit will be principally finished towards the latter end of this month; and it will be a convenient time for mixing fresh bark with the old, or wholly renewing the bark in the bins, as its state appears to require; as well as for painting, whitewashing, and in all respects putting the interior into complete order. The flues should also be swept.

Nursery.—Continue to dig, and throw into ridges, the ground designed for planting: transplant seedling trees and shrubs, and propagate by cuttings. Preserve Cherry and Plum stones for stocks, and plant the cuttings of Apples and Pears. Hoe and destroy weeds and vermin every where. Cuttings should always be planted in moist weather, to spare frequent watering.

TENTH MONTH.—OCTOBER.

Flower Garden and Shrubbery.—Tulips, Hyacinths, and other fine bulbous-rooted flowers, designed to blow during the winter, in the hot-house or forcing frames, should now be put into pots; and the bulbous roots designed for the borders, which yet remain out of the ground, would be better planted now than afterwards. Finish the planting of perennials. Put the pots of Carnations into hot-beds, and Roses into pots for forcing. Make cuttings of the best double Chrysanthemums. Prune, transplant, and propagate by cuttings, all kinds of shrubs. Dress the soil for the winter.

Kitchen Garden.—Tie up Endive as it is wanted for blanching; earth up Cardoons, and the last crop of Celery, in dry weather. Weed the Onions, Carrots, and winter Spinach. Plant out the early Cabbages, the last crop of Broccoli, and the Cauliflowers intended to be covered with glasses. Lettuces may be obtained in winter by covering them with glasses. Cut down the stalks of Asparagus, hoe the weeds, throw some earth upon them out of the trench, and cover them with rotten dung. Cut down Artichokes, and preserve them from the frost by covering the roots with straw. Sow early Peas and Beans on a south border; sow Cress, Mustard, and Radishes, for small salading. Cut down the flowering stems of aromatic and pot herbs; hoe them, and spread fresh earth upon the beds. Young Mint may be obtained in a month by planting roots of it in a hot-bed. Throw vacant ground into ridges, to be ready for any purpose. Finish the planting of Mushroom spawn, and cover the beds with straw, as Mushrooms grow the most rapidly without light. If the Mushroom beds be not under a shed, the straw must be renewed as often as it becomes wet.

Fruit Garden.—Gather all sorts of fruit as it ripens, as soon as the morning dew is gone, if for immediate eating; but not till the middle of the day, if to be preserved for some time. Examine the Grapes in bags, as they sometimes become mouldy. Prune and plant all kinds of fruit-trees. The soil of places where fruit-trees are to be placed, should be dug up, and left open for some weeks before the planting is commenced. In wet situations, lay down a cart-load of earth, and plant the tree on the top of a hillock formed with it.

Green-house.—Having had the whole interior well cleansed, painted, or whitewashed, and put into complete repair for winter, bring in the remainder of the plants, but let the sashes be always open when the weather is fine. Prune shrubs, and remove dead leaves as fast as they appear. Use but little water.

Hot-house.—If the weather be dry, and the evenings not frosty, fires will scarcely be yet required; but in case of damp weather, or when the thermometer is below 55 degrees in the morning, fires will be proper. Admit air during the greater part of every fine day. Water very sparingly.

Nursery.—Plant all kinds of forest-trees, evergreens, and shrubs. Sow Cherry and Plum stones, for stocks.

ELEVENTH MONTH.—NOVEMBER.

Flower Garden and Shrubbery.—Protect the seedling bulbs in borders, by straw or a covering of tanners' bark. Bulbous roots may still be planted, but unless it be done early in the month, they will be apt to come up weakly. Finish the planting of flowering shrubs of all sorts, and use fern, litter, or straw, to protect them from frost. Provide the materials of composts for spring use, as marl, loam, sand, bark, dung, &c. Roll grass walks. Several times in a week, remove decayed leaves.

Kitchen Garden.—Tie and earth up Cardoons and Endive: prick out Lettuces, to stand the winter in frames. In dry weather, earth up Celery for blanching. Plant Beans and Peas under a south wall. Earth up Broccoli and Cabbages. Dig up Carrots, Parsneps, Beets, Horse-radish, &c. and lay them in sand out of the reach of frost. Dig up Potatoes. Cut down Artichokes, and cover them first with soil, and upon that, litter, fern, or straw, to keep the frost from the roots. Weed Spinach and spring Onions.

Fruit Garden.—Prune Gooseberries and Currants, and make new plantations of them; prune and nail up Plum, Cherry, Peach, and other wall-fruits. Plant stone-fruits in open weather; also Walnuts and Filberts. Gather the remaining fruits; and protect from frost, the roots of Peaches, Figs, and the delicate kinds of fruit-trees, by litter or straw.

Green-house.—Fires will be occasionally required. Admit air as often as the weather will permit, especially if there be much fruit ripening. Clear away decayed leaves, and put fresh earth on the tops of the pots. Water frequently the dry woody plants, and others occasionally. Bring in Mignonette, China Roses, and other plants which might suffer from the cold.

Hot-house.—Keep the bark beds from fermenting violently, by too much heat; yet fires will be necessary in the evenings, to guard equally against cold and damp. Prune Vines, and tie them up. Gentle waterings will be required.

Nursery.—Haws must be gathered and sown in this month at latest. Plant forest-trees and their seeds early in the month. Shelter seedlings and all delicate plants from the frost, by straw, fern, &c. In open weather, vacant ground should be dug and prepared for the spring.

TWELFTH MONTH.—DECEMBER.

Flower Garden and Shrubbery.—Hyacinths, Tulips, Anemones, Ranunculuses, and other valuable roots in open borders, should be covered with a layer of bark two or three inches deep: bark that has become useless for the hot-house will answer for this purpose. In heavy rains or snow, a covering of mats should be superadded. Auriculas and Carnations likewise require protection from heavy rains, and falls of snow. The pots of all plants, which it is not thought necessary to carry into the green-house, should be entirely sunk into the earth, as frost will then have the least effect on them. Shrubs in general should be protected by straw, &c. and the more delicate kinds covered with mats, laid over arches formed by hoops. Standing water must be carried off by trenches and drains.

Kitchen Garden.—Occasionally take up the straw from Mushroom beds, to prevent mouldiness, and gather the Mushrooms which are ready. Sow Peas and Beans. Earth up Celery and Cardoons. Cover Endive and Parsley with straw. Earth up Broccoli, Borecole, and Cabbages, and pick off their decayed leaves. Cauliflowers and Lettuces under glasses should be weeded, and have fresh air in fine weather. Finish the taking up of Carrots, Parsley, &c. Give air to the Asparagus under frames.

Fruit Garden.—Stake newly planted standards which might be displaced by the wind, and protect with furze the trunks of all trees which would be injured by hares or rabbits. Manure the soil where fruit-trees stand. Prune fruit-trees. Examine gathered fruit, and pick out all that is decayed.

Green-house.—Keep out the frost and damp by gentle fires. Admit air, in clear mild weather. Remove all decayed leaves. Succulent plants will scarcely require any water, and other plants will require very little.

Hot-house.—Prune Vines, and train them in such a manner that they may throw the least shade upon the Pines. The heat of the bark should be kept nearly at 90 degrees; the average temperature of the house should be from 65 to 70 degrees. Weed every plant, and remove dead leaves. Fires will generally be required both evening and morning. Water sparingly.

Nursery.—Carry off stagnant water; trim hedges, trench vacant ground, and leave it in ridges for spring. Propagate trees and shrubs by layers and cuttings, and transplant the hardy sorts. Manure wherever it is required, and form composts for future use.

☞ It may not be superfluous to remark, that the preceding calendar is calculated for the south of England, but by an allowance of a week for every degree farther north than London, it will equally answer for any part of the United Kingdom. It must, however, be admitted, that in the same latitude, the warmth or bleakness of particular situations, will hasten or retard the times of sowing, and render precautions for the preservation of plants more or less necessary. The variableness of seasons is also a circumstance which cannot be provided against by rule, but the continuance of any particularly unseasonable weather should not be reckoned upon, without the exercise of a considerable share of discretion; thus if mild weather occur during the greater part of March, the following month is still not far enough advanced, to be out of the reach of frost, and care should therefore be takeu that if it occur, which in such a season is very likely, the tender plants and blossoms may take no harm; but if a frost of some strength and continuance occur late in April, it may safely be considered, when it breaks up, as the last of the season. In autumn, on the contrary, an early frost, or rough weather, is frequently only the precursor of a late and mild, if not a fine season.

CATALOGUE OF TREES AND SHRUBS.

HARDY DECIDUOUS TREES.

ACACIA. See Gleditsia, and Robinia.

Acer campestre. *Common* or *small Maple.* Hedge-rows and Coppices. 10 to 25 feet.

Acer creticum. *Cretan Maple.* About 20 feet. In sheltered situations retains its leaves almost all the year.

Acer monspessulanum. *Montpellier Maple.* 20 feet.

Acer montanum. *Mountain Maple.* Small.

Acer Negundo. *Virginian Ash-leaved Maple.* 40 feet and upwards.

Acer Opalus. *Italian Maple.* 40 feet and upwards.

Acer pennsylvanicum. *Pennsylvanian Maple.* 15 feet.

Acer platanoides. *Norway Maple.* 40 feet and upwards. —Varieties, the Jagged-leaved and Variegated.

Acer Pseudoplatanus. *Great Maple* or *Sycamore.* 40 feet and upwards. Leafs in April or May.—Varieties, with broader, and with variegated leaves.

Acer rubrum. *Scarlet-flowering, Maple.* 20 feet.—Variety, Sir Charles Wager's Maple, with paler flowers, in larger clusters.

Acer saccharinum. *American Sugar Maple.* 40 feet.

Acer tataricum. *Tartarian Maple.* Small, 20 feet.

Æsculus Hippocastanum. *Common Horse Chestnut.* 40 feet and upwards. Leafs in April or May.—Varieties, with white-striped leaves, and yellow-striped leaves.

Æsculus flava. *Yellow-flowered Horse-Chestnut.*

Æsculus Pavia. *Scarlet Horse-Chestnut.* 15 or 16 to 20 or 25 feet. June.

Alnus *Alder.* See Betula.

Amygdalus communis. *The Almond tree.* 15 to 20 feet. Ornamental, leafing and flowering in April or May.—Variety with white flowers.

Amygdalus orientalis. *Eastern* or *Silver-leaved Almond.* Somewhat tender.

Amygdalus Persica. *The Peach-tree.* Ornamental, especially the variety with double flowers. April.

Apple. See Pyrus.

Annonas cannot properly be called hardy; *triloba* and *glabra* will live in a warm situation.

Aralias can scarcely be considered as trees.

Ash-tree. See Fraxinus. Ash, Mountain. See Sorbus.

Bay-tree. See Laurus.

Beech-tree. See Fagus.

Benjamin-tree. See Laurus.

Betula Alba. *Common Birch-tree.* From 20 to 40 feet.—Varieties, Weeping, Dwarf.

Betula lenta. *Canada Birch.* 40 feet to 60. N. Amer.—Varieties, Dusky, White-paper, Poplar-leaved, Low.

Betula nigra. *Black Virginia Birch.* 60 feet and upwards. N. Amer.—Varieties, Broad-leaved, Poplar-leaved, Paper, Brown, &c.—Poplar-leaved and Paper Birch are considered as distinct species in the New Catalogue, where there is also a B. excelsa, or *Tall Birch*, from North America. Pallas has two species from Siberia; *daurica* and *fruticosa.*

Betula Alnus. *The Alder-tree.* 20 to 35 feet.—Varieties are the White, Black, Cut-leaved, and Dwarf American.

Betula incana. *Hoary* or *Silver-leaved Alder.* Small.—Varieties, Cut-leaved, Dwarf, Long-leaved, Rose-flowered.

Betula oblongata. *Turkey Alder.* Commonly known in the Nurseries under the name of *Long-leaved Alder.* Of this there are several varieties.

Betula serrulata. *Notch-leaved Alder.* N. Amer. Very ornamental.

Betula crispa. *Curled-leaved Alder.* Newfoundland and Hudson's Bay.

Bignonia Catalpa. *The Catalpa-tree.* 30 or 40 feet. Carolina. Leaves large but late. It flowers in August. Requires to be sheltered from wind.

Birch. See Betula. Bird-Cherry. See Prunus.

Carpinus Betulus. *The Hornbeam-tree.* 60 or 70 feet, but seldom seen of that height. Leafs in April.—Varieties, Eastern, Cut-leaved, Gold-striped.

Carpinus Ostrya. *Hop Hornbeam.* About 20 feet.

Carpinus Virginiana. *Flowering Hornbeam.* 30 feet and upwards. Virginia.

Castanea. See Fagus. Catalpa. See Bignonia.

Celtis australis. *European Nettle-tree.* 40 or 50 feet.

Celtis occidentalis. *American Nettle-tree.* Height the same.

Celtis orientalis. *Oriental Nettle-tree.* 10 or 12 feet. The fruit of the first is black, of the second purple, and of the third yellow.

Cerasus. See Prunus.

Cercis Canadensis. *Canada Judas-tree.* 12 feet to 20.

Cercis Siliquastrum. *Common Judas-tree.* 20 feet. Both ornamental. Flower in May.

Cherry. See Prunus.

Chestnut. See Fagus. Chestnut, Horse. See Æsculus.

Christ's-thorn. See Rhamnus.

Cornus mascula. *Cornelian Cherry.* 20 feet high. The other species are shrubs.

Corylus Avellana. *The Hazel-nut-tree* is properly a Shrub.

Crab. See Pyrus.

Cratægus aria. *White Beam-tree.* 20 and 30 to 40 feet. Ornamental, particularly from the whiteness of the leaves. It leafs in April, and flowers in May.

Cratægus terminalis. *Wild Service.* 40 or 50 feet. A fruit-tree.—An Alpine variety, 20 feet high. The other species are shrubs.

Cupressus disticha. *Deciduous Cypress-tree.* 30 feet high and more. Native of America, where it is very large, above 70 feet high.

Cytisus Laburnum, commonly called *Laburnum*, may be trained as a tree, and will grow to the height of 15 or 20 feet.—Varieties are, Variegated broad-leaved, Scotch short-flowered, and Long-spiked narrow-leaved Laburnum. It is commonly cultivated as a flowering shrub, and all the other species are shrubs.

Diospyros Lotus. *European Date-Plum.* 20 feet.

Diospyros Virginiana. *American Date-Plum*, or *Pishamin*, or *Persimon.* 15 or 16 feet.

Elæagnus angustifolia. *Narrow-leaved Oleaster.* Height 18 feet. Leaves and twigs white. South of Europe, the Levant, and Russia.

Elder. See Sambucus. Elm. See Ulmus.

Euonymus Europæus. *Common* or *narrow-leaved Spindle-tree.* 20 feet.

Euonymus latifolius. *Broad-leaved Spindle-tree.* 25 feet.—The first varies with white fruit; and the second with variegated leaves. They commonly appear as shrubs in plantations.

Fagus Castanea. *Common* or *Sweet Chestnut-tree.* One of the largest timber trees; but most excellent in coppice.—Variety with gold stripes.

Fagus pumila. *Dwarf Chestnut*, or *Chinquapine.* 12 or 14 feet. North America.

Fagus sylvatica. *The Common Beech-tree;* attains a great height, size, and spread.—Varieties, with yellow, and with white stripes; and with brown-purple leaves; when it has a rougher bark, the woodmen call it *Hay-Beech.* Some trees retain their leaves, others not.

Fothergilla alnifolia obtusa. *Br.-leaved Fothergilla.* N. Amer.

Fraxinus Americana. *American Ash-tree.*—There are several varieties of this, White Ash, Red Ash, Black Ash, &c.

Fraxinus excelsior. *Common Ash-tree.* Lofty.—Varieties, with simple leaves, which, however, sometimes become lobed, and even ternate.—With pendulous branches, the *Weeping Ash;* gold-striped and silver-striped.

Fraxinus Ornus. *Flowering Ash-tree.*

Fraxinus rotundifolia. *Manna Ash-tree.* 15 or 16 feet.

Ginkgo. See Salisburia.

Gleditsia triacanthos. *Triple-thorned Acacia.* In America, *Honey-Locust.* 30 to 40 feet. Leafs in June: flowers at the end of July.—Variety with fewer thorns, and one seed in a pod. *Water Acacia.* Another with stronger spines.

Gnilandina dioica. *Hardy Bonduc*, or *Canada Nickar-tree.* 30 feet and more.

Judas-tree. See Circis. Hazel-tree. See Corylus.

Hornbeam. See Carpinus.

Juglans alba. *White Walnut-tree* or *Hickery.* N. Amer.

Juglans angustifolia. *Narrow-leaved Walnut-tree.* N. Amer.

Juglans cinerea. *Ash-coloured Walnut-tree.* N. Amer.

Juglans compressa. *Flat-fruited Walnut-tree.* N. Amer.

Juglans nigra. *Black Walnut-tree.* N. Amer.

Juglans oblonga. *Oblong-fruited Walnut-tree.* N. Amer. There are other species in North America. The Black Virginia Walnut grows 50 or 60 feet high, and the others 30 or 40. They have very branching heads.

Juglans regia. *Common Walnut-tree.* 50 or 60 feet. Leafs and flowers in May.—Varieties, Large, Thin-shelled, Double-bearing, Late-ripe, &c.

Jujube. See Rhamnus.

Laburnum. See Cytisus.

Larch. See Pinus.

Laurus æstivalis. *Willow-leaved Bay-tree.* N. America. South wall.

Laurus Benzoin. *Common Benjamin-tree.* Virginia.

Laurus Sassafras. *Sassafras-tree.*

Lime-tree. See Tilia.

Liquidambar imberbe. *Oriental Liquidambar.*

Liquidambar styraciflua. *Maple-leaved Liquidambar*, or *Sweet Gum.* 40 feet and upwards. N. Amer.

Liriodendron tulipifera. *Common Tulip-tree.* 70 or 80 feet. N. Amer. In England, about 40 feet.

Magnolia acuminata. *Blue Magnolia.* 30 to 40 feet. N. America.

Magnolia glauca. *Swamp Magnolia.* 15 or 16 feet. North America.

Magnolia tripetala. *Umbrella Magnolia*, or *Umbrella-tree.* 16 to 20 feet. N. Amer.

Maple. See Acer. Nettle-tree. See Celtis.

Nyssa integrifolia. *Mountain Tupelo*, or *Sour Gum.* 30 to 40 feet. N. Amer.

Nyssa denticulata. *Water Tupelo.* 80 to 100 feet in Carolina and Florida.

Oleaster. See Elæagnus. Oak. See Quercus

Peach-tree. See Amygdalus. Pear. See Pyrus.

Pinus larix. *Common White Larch-tree.* 50 feet. Leafs in April. Pishamin. See Diospyros.

Pistacia officinalis. *Pistacia-tree.*—Trifolia, narbonensis, vera. Levant.

Pistacia Terebinthus. *Turpentine-tree.* South of Europe.

Platanus occidentalis. *American Plane-tree.* Height 60 to 70 feet. N. Amer.

Platanus orientalis. *Oriental Plane-tree.* Asia.—Varieties, Maple-leaved, Spanish, and Wave-leaved.

Pomegranate. See Punica.

Populus alba. *White Poplar.*—Variety, Great White Poplar, or Abele.
Populus angulata. *Carolina Poplar.*
Populus balsamifera. *Common Tacamahaca Poplar-tree.* N. America and Siberia. Leafs in April.
Populus candicans. *Heart-leaved Tacamahaca Poplar-tree.* Canada.
Populus dilatata. *Lombardy* or *Po Poplar-tree.* 40 to 60 feet. Leafs in May.
Populus Græca. *Athenian Poplar-tree.* Archipelago.
Populus heterophylla. *Various-leaved Poplar-tree.* Virginia and New York.
Populus lævigata. *Smooth Poplar-tree.* N. Amer.
Populus monilifera. *Canadian Poplar-tree.* N. Amer.
Populus nigra. *Black Poplar-tree.*
Populus tremula. *Trembling Poplar-tree* or *Asp.*
Prunus avium. *Wild Cherry-tree.*—Varieties, with black or red fruit, and with double flowers.
Prunus Canadensis. *Canadian Bird-Cherry-tree.*
Prunus cerasus. *Cultivated Cherry-tree,* with double flowers.
Prunus domestica. *Common Plum-tree.*—Ornamental varieties are, Double-blossomed, Gold-striped, Silver-striped, and Stoneless.
Prunus mahaleb. *Perfumed Cherry-tree.* Low and crooked. The wood has an agreeable odour. Flowers in April and May. Germany and S. of Europe, Crimea, Caucasus.
Prunus nigra. *Canadian Black Cherry-tree.*
Prunus padus. *Common Bird-Cherry-tree.* 10 to 12 feet. Flowers in May.
Prunus Pennsylvanica. *Pennsylvanian* or *Upright Cherry-tree.* Flowers in May.
Prunus rubra. *Cornish* or *Red Bird-Cherry-tree.*
Prunus Virginiana. *Common American Bird-Cherry-tree.*
Punica granatum. *Pomegranate-tree.* 18 or 20 feet.—Variety with double flowers. Requires a warm situation, and is commonly planted against a wall.
Pyrus angustifolia. *Narrow-leaved Crab-tree.* Flowers in May. N. Amer.
Pyrus baccata. *Small-fruited Crab-tree.* April. Siberia.
Pyrus communis. *Common Pear-tree.*—Varieties, Double-flowering, and Twice-flowering.
Pyrus coronaria. *Sweet-scented Crab-tree.* N. Amer. May.
Pyrus malus. *Common Apple-tree.*—Variety with double flowers.
Pyrus nivalis. *Alpine Pear-tree.*
Pyrus pollueria. *Woolly-leaved Pear-tree.* Germany.
Pyrus prunifolia. *Siberian Crab-tree.*
Pyrus salicifolia. *Willow-leaved Crab-tree.* Siberia, Caucasus, Persia. Low and bushy.
Pyrus spectabilis. *Chinese Apple-tree.* 20 to 30 feet. Flowers large and beautiful. Beginning of May. Sheltered situation.
Quercus ægilops. *Great prickly-cupped Oak-tree.* S. of Europe and the Levant.
Quercus alba. *White Oak-tree.* N. Amer.
Quercus aquatica. *Water Oak-tree.* N. Amer.
Quercus cerris. *Turkey Oak-tree.* S. of Europe.—Varieties, Rough-leaved, Narrow-leaved, Lucombe or Devonshire.
Quercus discolor. *Downy-leaved Oak-tree.* N. Amer.
Quercus esculus. *Italian* or *small prickly-cupped Oak-tree.* S. of Europe.
Quercus nigra. *Black Oak-tree.* N. Amer.
Quercus phellos. *White-leaved Oak-tree.* N. America.—Varieties, Short, Long, and Various-leaved.
Quercus prinus. *Chestnut-leaved Oak-tree.*—Varieties, Broad-leaved and Long-leaved.
Quercus rubra. *Red Oak-tree.* N. Amer.—Varieties, Champion, Scarlet, and Mountain Red Oak.
Quercus robur. *Common Oak.*—Varieties, Stalk-fruited, Sessile-fruited, and Dwarf Silver-striped.
Rhamnus paliurus. *Common Christ's-thorn.* S. of Europe, Levant, Caucasus, and Barbary.
Rhamnus Spina Christi. *Syrian Christ's-thorn.* Palestine, Barbary, Egypt.
Rhamnus Zizyphus. *Jujube.* S. of Europe, Africa, China, Cochin-china, and Japan.
These can scarcely be called hardy, since they will live only against a wall in mild winters.
Robinia pseud-acacia. *Common* or *False Acacia,* or *Locust-tree.* Large. Leafs late. N. America.
Salisburia adiantifolia. *Ginkgo,* or *Maidenhair-tree.* Commonly planted against a wall.
Salix alba. *White Willow.* Large and lofty. Leaves silvery.
Salix amygdalina. *Broad-leaved* or *Almond-leaved Willow.* Scarcely rises to a tree.
Salix Babylonica. *Weeping Willow.* Large. Admired for its pendulous branches. Levant. Leafs early.
Salix caprea. *Round-leaved Sallow.* Sometimes becomes a large tree.—There is a striped-leaved variety in the nurseries.
Salix cinerea. *Cinereous-leaved Sallow,* which is the *Common Sallow* of Britain, is rather a shrub or coppice-plant than a tree.
Salix fragilis. *Crack Willow.* Very large.
Salix hastata. *Halbert-leaved Willow.* A little tree, never tall.
Salix helix *Rose Willow.* A small slender tree, 10 or 12 feet high.
Salix lanata. *Woolly-leaved Willow.* A dwarf tree.
Salix pentandra. *Sweet* or *Bay-leaved Willow.* 10 or 12 feet high.
Salix triandra. *Long-leaved three-stamined Willow.* 30 feet, but generally kept low for Osiers. Ornamental.
Salix vitellina. *Yellow Willow.* Middle-sized.
Sambucus nigra. *Common Elder-tree.* 12 to 16 feet.—Varieties, Green-berried, White-berried, Parsley-leaved, Silver-striped, Silver-dotted, Gold-striped.
Sambucus racemosa. *Red-berried* or *Mountain Elder.* 10 or 12 feet. This, with the *Canadensis,* are rather shrubs; and the Common Elder appears more frequently in that form than as a tree.
Sassafras-tree. See Laurus.—Service. See Sorbus.—Service, Wild. See Cratægus.
Sorbus aucuparia. *Mountain Ash.* Leafs in April.
Sorbus domestica. *Service-tree.*
Sorbus hybrida. *Bastard Service-tree.*
These are middle-sized trees, of slow growth.
Spindle-tree. See Euonymus.
Styrax officinale. *Officinal Storax.* 12 or 14 feet. Italy and the Levant. This, however, with the *grandifolium* and *lævigatum,* can scarcely be called hardy trees.
Sycomore. See Acer.—Tacamahaca. See Populus.
Tamarix Gallica. *French Tamarisk.* Middle-sized, in England 14 or 16 feet. An elegant tree. S. of Europe, Tartary, &c.
Tamarix Germanica. *German Tamarisk,* is rather a shrub.
Tilia alba. *White Lime-tree.*
Tilia Americana. *Broad-leaved American Lime-tree.*
Tilia Europea. *Common* or *European Lime* or *Linden-tree.*—Varieties, Large-leaved, Small-leaved, Elm-leaved, Stripe-leaved, Red-twigged.

Tilia pubescens. *Pubescent Carolina Lime-tree.* Toothache Tree. See Xanthoxylum.
Tulip-tree. See Liriodendron.—Tupelo. See Nyssa.—Turpentine-tree. See Pistacia.
Viburnum lantana. *Wayfaring-tree.*
Viburnum opulus. *Water Elder.*
These are rather shrubs than trees.—The American variety of the first is much larger—the striped variety is in no great esteem.—Varieties of the second, the American with red shining twigs, and the Guelder-Rose, both plain and striped.
Ulmus Americana. *American Elm.*—Varieties, Red, White, Drooping.
Ulmus campestris. *Common Elm.*—Varieties, Narrow-leaved or English Elm, Weeping, Silver-striped, and Gold-striped.
Ulmus montana. *Broad-leaved Elm, Wych Hazel, Wych* or *Witch Elm.*—Variety, the Smooth-leaved.
Ulmus nemoralis. *Hornbeam-leaved Elm.* N. Amer.
Ulmus suberosa. *Dutch Elm.*
Walnut. See Juglans.—Willow. See Salix.—Water Elder and Wayfaring-tree. See Viburnum.
Xanthoxylum Clava Herculis. *Common Toothache-tree.*

HARDY EVERGREEN TREES.

Abies. *Fir.* See Pinus.—Adam's Needle. See Yucca.—Alaternus. See Rhamnus.
Arbor vitæ. See Thuja.
Arbutus Andrachne. *Oriental Strawberry-tree.* Middle-sized. Levant.
Arbutus laurifolia. *Laurel-leaved Strawberry-tree.* N. Amer.
Arbutus unedo. *Common Strawberry-tree.* 20 to 30 feet. Flowers and fruits in October and November. Ireland, S. of Europe, Greece, Palestine, and other parts of Asia.—Varieties, with white, red, and double flowers, with round and oval fruit, with leaves broad or narrow, smooth or rough, cut or curled.
Bay. See Laurus.
Buxus sempervirens. *Box-tree.* 12 or 15 feet high.—Varieties, Narrow-leaved, Dwarf used for edging, Myrtle-leaved, Gold-striped or edged, Silver-striped or edged, Gold-tipped.
Cedar of Lebanon. See Pinus.—Cork-tree. See Quercus.
Cupressus pendula. *Portugal Cypress.* Tender.
Cupressus sempervirens. *Evergreen Cypress.* 30 feet.—Varieties, Upright and Spreading.
Cupressus thyoides. *White Cedar,* or *Arbor-vitæ-leaved Cypress.*
Fir-tree. See Pinus.
Holly. See Ilex.
Ilex Aquifolium. *Common Holly.* 20 to 30 feet.—Varieties very numerous, Hedge-hog, Yellow-berried, Gold-edged, Silver-edged, &c. &c. mostly too fanciful to name.
Ilex Cassine. *Dahoon Holly.* Tender. Florida and Carolina.—Varieties, Broad-leaved and Narrow-leaved.
Ilex opaca. *Carolina Holly.*
Ilex vomitoria. *Smooth-sea Tea,* or *Evergreen Cassine.* Cassine Perugua *Mill. and Catesb.* 10 or 12 feet. West Florida. These are tender.
Ilex or *Evergreen Oak.* See Quercus.
Juniperus Bermudiana. *Bermudas Juniper.* Can scarcely be called hardy.
Juniperus communis. *Common Juniper,* is a shrub; but the variety called *Swedish Juniper,* rises from 10 or 12 to 15 or 16 feet in height.
Juniperus lycia—Oxycedrus, phœnicia, should rather be ranged among shrubs, with Sabina.
Juniperus thurifera. *Spanish Juniper.* 25 or 30 feet.
Juniperus Virginiana. *Virginian Juniper,* or *Red Cedar.* A large tree.
Laurus nobilis. *Common Sweet Bay.* 20 or 30 feet high in the S. of Europe, Asia, &c. In England it appears as a shrub.—Varieties, Broad-leaved, Narrow-leaved, Waved-leaved, Striped-leaved, Double-flowered.
Magnolia grandiflora. *Laurel-leaved Magnolia.* 70 or 80 feet in Carolina and Florida. Impatient of cold in England.
Oak. See Quercus.
Olea Europea. *Common Olive-tree.* It can scarcely be called hardy, and should be planted against a south wall. The Lucca and Box-leaved varieties are the least tender.
Philadelphus aromaticus. *Sweet-scented New Zealand Tea-tree,* may be preserved with care against a south wall.
Pinus abies. *Norway Spruce Fir-tree.* Height 125 to 150 feet. Denmark, Norway, Sweden, &c.
Pinus alba. *White Spruce Fir-tree.* N. Amer.
Pinus balsamea. *Balm of Gilead Fir-tree.* N. Amer.
Pinus Canadensis. *Hemlock Spruce Fir-tree.* N. Amer.
Pinus cedrus. *Cedar of Lebanon.* Lebanon, Amanus, and Taurus. Height from 50 to 70 feet, spread 100 feet.
Pinus cembra. *Siberian Stone Pine-tree.* Switzerland and Siberia.
Pinus halepensis. *Aleppo Pine-tree.*
Pinus inops. *Jersey Pine-tree.* N. Amer.
Pinus nigra. *Black Spruce Fir-tree.* N. America.—Red Spruce seems not to be different from this; and the long-coned Cornish Fir of the nurseries, is only a variety of it.
Pinus orientalis. *Oriental Fir-tree.* Levant.
Pinus palustris. *Swamp Pine-tree.* Carolina and Georgia. 25 or 30 feet there.
Pinus picea. *Silver Fir-tree.* Beautiful and lofty. Switzerland, Germany, Austria, Dauphiné, Siberia, Caucasus.
Pinus pinaster. *Pinaster* or *Cluster Pine-tree.* S. of Europe.
Pinus pinea. *Stone Pine-tree.* S. of Europe.
Pinus resinosa. *American Pitch Pine-tree.*
Pinus sylvestris. *Wild Pine-tree,* called in Britain Scotch Fir. 80 feet. N. of Europe.—Varieties, Tartarian, Mountain, Mugho, or Torch Pine, Hudson's Bay Pine, and Sea Pine, which grows on the coast of the south of France and of Italy.
Pinus strobus. *Weymouth Pine-tree,* or *White Pine* in N. America. 100 feet.
Pinus tæda. *Frankincense Pine-tree.* N. Amer.—Varieties, Three-leaved Virginian, Variable, and Foxtail Pine.
Quercus coccifera. *Kermes Oak-tree.* 12 or 14 feet. S. of Europe, Levant, &c. Rather a bushy shrub than a tree.
Quercus gramuntia. *Holly-leaved Evergreen Oak.* S. of France.
Quercus ilex. *Evergreen* or *Holm Oak-tree.* 40 or 50 feet. S. of Europe.—Varieties, Entire-leaved, Serrate-leaved, Long-leaved.
Quercus suber. *Cork-tree.* S. of Europe. Killed in England in severe winters.—Varieties, Broad and Narrow-leaved.
Quercus virens. *Live Oak-tree.* 40 feet. N. Amer.
Strawberry-tree. See Arbutus.
Taxus baccata. *Common Yew-tree.*
Thea viridis et bohea. *Green and Bohea-tree.* It commonly appears in China as a shrub, but it is said that it will attain 30 feet or more, if left to its natural growth.
Thuya occidentalis. *Common Arbor vitæ.* 30 or 40 feet. N Amer.—Varieties, Stripe-leaved, and Sweet-scented.
Thuya orientalis. *Chinese Arbor vitæ.*
Yew-tree. See Taxus.
Yucca filamentosa. *Virginian thready-leaved Yucca.* Virginia.

Yucca gloriosa. *Canadian Yucca*, or *Adam's Needle.*—These must have a warm dry situation.

FRUIT TREES AND SHRUBS.

Amygdalus communis. *Common Almond.*—Varieties, Bitter, Sweet, Jordan, Tender-shelled, Hard-shelled.

Amygdalus Persica. *The Peach* and *Nectarine.*

Annona glabra. *Smooth Custard Apple.* 16 feet. N. Amer.

Annona triloba. *Trifid-fruited Custard Apple*, or *Papaw-tree.* 10 or 12 feet. Carolina, Virginia, and the Bahama Islands.—These are tender whilst young, and the fruit is little esteemed, even in America.

Apple. See Pyrus.

Apricot. See Prunus.

Arbutus unedo. *Strawberry-tree.* Eaten in the S. of Europe by rustics.

Berberis vulgaris. *Barberry.*—Varieties, Common Red, and without seeds, White, and Black Sweet.

Bilberry. See Vaccinium.

Blackberry and Bramble. See Rubus.

Celtis australis. *European Nettle-tree*, or *Lote-tree.* S. of Europe. Berries eaten by children.

Cherry. See Prunus.

Chestnut. See Fagus.

Cornus mascula. *Cornelian Cherry.* This fruit, which is of a shining scarlet, and the size of a small Olive or Acorn, was used formerly in tarts, and in medicine in form of a rob.

Citrus aurantium. *Orange.* C. Limon. *Lemon.* In greenhouses.

Cloud-berry. See Rubus.

Corylus avellana. *Hazel-nut-tree.*—Varieties, common Wood-nut, with red-skioned kernels, large Cob-nut, large Long Nut, Barcelona or Spanish Nut, large Cluster Wood-nut, Filbert with white, and with red kernels.

Corylus Colurna. *Byzantine Hazel-nut.*—C. rostrata. *American Cuckold-nut.*

Cranberry. See Vaccinium.

Cratægus Azarolus. *Parsley-leaved Hawthorn*, or *Azarole.* S. of Europe and Levant, and served up there in the dessert.

Cratægus torminalis. *Wild Service-tree.* Europe. Fruit eaten as Medlars, and sold in the London markets.

Currants. See Ribes.

Cydonia. See Pyrus.

Dewberry. See Rubus.

Diospyros lotus. *European Date-plum.* S. of Europe, Asia, and E. coast of Africa. Fruit size of a Cherry, yellow, sweet with astringency.

Diospyros Virginiana. *American Date-plum.* N. America, where it is called *Pishamin*, or *Persimon.* Fruit like a Date, almost as firm and sweet, from the end of September.

Elder. See Sambucus.

Fagus castanea. *The Chestnut-tree*, commonly called the Spanish Chestnut. Naturalized in Europe, but originally from Asia.

Fagus pumila. *Dwarf Chestnut-tree*, or *Chinquapine.* 12 to 14 feet. N. America.

Ficus carica. *Common Fig-tree.* Mr. Forsyth mentions 27 varieties.

Filbert and Hazel-nut. See Corylus.

Gooseberry. See Ribes.

Juglans alba. *White Walnut-tree*, or *Hickory.* N. Amer.

Juglans angustifolia. *Narrow-leaved Walnut-tree.* N. Amer.

Juglans cinerea. *Ash-coloured Walnut-tree.* N. America.

Juglans compressa. *Flat-fruited Walnut-tree.* N. Amer.

Juglans nigra. *Black Virginia Walnut-tree.*

Juglans oblonga. *Oblong-fruited Walnut-tree.* N. Amer.

Juglans regia. *Common Walnut-tree.* From Asia to Europe.—Varieties, Double, Large, French, Thin-shelled, Late.

Juglans baccata. *Berried Walnut-tree.* Jamaica.

Juglans olivæformis. *Olive-shaped Walnut-tree.* Upper Louisiana.

Juglans sulcata. *Thick-shell bark Hickory.* Allegany mountains.

Juglans amara. *Bitter Walnut-tree.* New England to Maryland.

Juglans porcina. North America.

Juglans aquatica. *Water Walnut-tree*, or *Water Bitter Nut Hickory.* North America.

Juglans myristicæformis. *Nutmeg Hickory.* S. Carolina.

Lemon. See Citrus.

Medlar. See Mespilus.

Mespilus amelanchier. *Alpine Mespilus.* Fruit small, black, sweet like honey.

Mespilus Germanica. *Dutch Medlar.*—Varieties, Narrow-leaved, Broad-leaved. Nottingham.

Morus nigra. *Common Mulberry-tree.* Persia.

Nectarine. See Amygdalus.

Nut. See Corylus.

Olea Europæa. *European Olive.*

Orange. See Citrus.

Peach. See Amygdalus.

Pear. See Pyrus.

Pinus pinea. *The Stone Pine.*

Pistacia vera. *Pistacia Nut Tree.*

Plum. See Prunus.

Pomegranate. See Punica.

Prunus Armeniaca. *The Apricot.* Principal varieties are, Algiers, Breda, Brussels, Masculine, Moor Park of Anson's, Orange, Roman, Turkey.

Prunus cerasifera. *Myrobalan Plum.* N. Amer.

Prunus cerasus. *The Cherry.*—Principal Varieties are the Dukes, Hearts, Corone, Morello, &c.

Prunus domestica. *The Plum.*—Varieties numerous; the most useful are, The Jaunhative, Early Damask, Orleans, Royal, Green Gage, Drap d'Or, Saint Cathatine, Imperatrice. The Bonum Magnum for baking, and the Wine-sour for preserving.

Prunus insititia. *The Bullace Plum.*—Varieties, Black and White, or rather Yellow.

Prunus spinosa. *The Sloe Plum.*

Punica granatum. The Pomegranate.

Pyrus communis. *The Pear.*—Varieties very numerous; the most useful are, for Summer, Musk, Green Chisel, Jargonelle, Summer Bergamot, and Summer Boncretien—for Autumn, Orange Bergamot, Autumn and Gansel's Bergamot, brown Beurré, Doyen or St. Michael, and Swan's-egg—for Winter, Crasane, Chaumontelle, St. Germain, Colmar, D'Auch, L'Eschasserie, Winter Boncretien, and Bergamot de Pasque.

Pyrus cydonia. *The Quince.*—Varieties, Oblong, Apple, Portugal, &c.

Pyrus malus. *The Apple.*—Varieties, very numerous; the following may suffice for a small garden and orchard:—Juneting, Golden Pippin, Nonesuch, Ribstone Pippin, Nonpareil, Queen's, Golden Rennet, Aromatic Pippin, Lemon Pippin, Scarlet Pearmain, Pomme Gree; with different Russetins and Codlins for baking.

Pyrus prunifolia. *The Siberian Crab:* for baking.

Quince. See Pyrus cydonia.

Raspberry. See Rubus.
Ribes alpinum. *Tasteless Mountain Currant.* Eaten only by children.
Ribes diacantha. *Two-spined Gooseberry.* Siberia.
Ribes floridum. *American Black Currant.*
Ribes fragrans. *Fragrant Currant.* Siberia.
Ribes glandulosum. *Glandulous Currant.* N. America.
Ribes grossularia. *Rough-fruited*—and Uva-crispa, *Smooth-fruited, Gooseberry.* Principal varieties, Green Gascoin, Smooth Green, Early Black, Small Early Red, Large Smooth Dutch Yellow, Hairy and Smooth Red, Large Rough and Smooth Yellow, Common and Large White, Champaigne. Subordinate varieties infinite, some weighing 17 penny-weights and upwards.
Ribes nigrum. *Black Currant.*
Ribes oxyacanthoides. *Hawthorn-leaved Gooseberry.* Canada.
Ribes petræum. *Rock Currant.* England, &c.
Ribes procumbens. *Trailing Currant.* Dauria.
Ribes reclinatum. *Procumbent Gooseberry.* Germany any Switzerland.
Ribes rubrum. *Common Currant.*—Varieties, Common Red, Champagne Large Pale and Red, Long-bunched Red, Large Pale and Red Dutch, White Dutch, White Crystal.
Ribes saxatile. *Mountain Gooseberry.* Siberia.
Ribes spicatum. *Acid Mountain Currant.* England.
Ribes triste. *Dark Currant.* Siberia.
Ribes albinervium. *Hoary-nerved Red Currant.* Lake Mistassins.
Ribes aureum. *Golden Red Currant.* Banks of the river Missouri.
Ribes trifidum. *Trifid Red Currant.* Canada.
Ribes rigens. Pennsylvania.
Ribes prostratum. *Prostrate Red Currant.* Newfoundland.
Ribes viscosissimum. North America.
Ribes resinosum. North America.
Ribes sanguineum. Banks of the Columbia river.
Ribes recurvatum. *Recurved Black Currant.* Hudson's Bay.
Ribes rotundifolium. *Round-leaved Gooseberry.* Carolina.
Ribes hirtellum. Virginia.
Ribes gracile. *Slender Gooseberry.* New York.
Ribes lacustris. Canada.
Rubus arcticus. *Dwarf Crimson Bramble.* N. Europe, Asia, America.
Rubus cæsius. *Dewberry.*
Rubus canadensis. *Canadian Raspberry.*
Rubus chamæmorus. *Mountain Bramble*, or *Cloud-berry.*
Rubus corylifolius. *Hazel-leaved Bramble.*
Rubus fruticosus. *Common Bramble.*
Rubus idæus. *Raspberry.*—Varieties, Large Red, Antwerp, Early White, Double-bearing, Large Common, Large White, Smooth Cane Double-bearing.
Rubus occidentalis. *Virginian Raspberry.* Black with little flavour.
Rubus odoratus. *Flowering Raspberry.* N. Amer. It bears no fruit here. There are many other species, natives of S. America, Japan, &c. but of no account here for fruit.
Sambucus nigra. *Common Elder.*—Varieties, with Black, Green, and White Berries.
Sambucus canadensis. *Canadian Elder.*
Sambucus racemosa. *Red-berried Elder.* Germany, Switzerland, Italy, and Siberia.
Service. See Cratægus and Sorbus.
Sorbus domestica. *True* or *Cultivated Service* or *Sorb.*—Varieties, Apple-shaped, Pear-shaped.
Sorbus aucuparia, or *Mountain Ash*, bears fruit fit only for birds.
Vaccinium hispidulum. *Hairy-stemmed American Cranberry.* Common in London for tarts.
Vaccinium macrocarpon. *Smooth-stemmed American Cranberry.*
Vaccinium myrtillus. *Bilberry, Bleaberry, Whortleberry*, or *Black Worts.* Europe, Siberia, and Barbary.
Vaccinium oxycoccus. *European Cranberry.* Europe, on bogs.
Vaccinium vitis idæa. *Red Bilberry* or *Whortleberry*, or *Cowberry.* Europe.
Vaccinium uliginosum. *Great* or *Marsh Bilberry* or *Whortleberry.* Europe and Siberia.
Vitis vinifera. *Common Vine.*—Varieties very numerous; the best to be cultivated in England are, The White Muscadine, White Sweet-water, Black Sweet-water, Large and Small Black Cluster, and Miller. St. Peter's and Black Hamburgh will do very well in favourable seasons.
Walnut. See Juglans.
Whortleberry. See Vaccinium.

CLIMBING TREES AND SHRUBS.

Bignonia radicans. *Rooting* or *Ash-leaved Trumpet-flower.*
Bignonia sempervirens. *Carolina* or *Evergreen Trumpet-flower*, or *Yellow Jasmine.*
Bignonia unguis. *Four-leaved Trumpet-flower*
Celastrus scandens. *Climbing Staff-tree.*
Clematis calycina. *Minorca Virgin's Bower.*
Clematis cirrhosa. *Evergreen Virgin's Bower.*
Clematis crispa. *Curled Virgin's Bower.*
Clematis flammula. *Sweet-scented Virgin's Bower.*
Clematis florida. *Large-flowered Virgin's Bower.*
Clematis viorna. *Leathery-flowered Virgin's Bower.*
Clematis Virginiana. *Virginian Virgin's Bower.*
Clematis vitalba. *Common Virgin's Bower, Wild Climber*, or *Traveller's Joy.*—Variety, C. canadensis, *Broad-leaved Canada Virgin's Bower*, or *Climber.*
Clematis viticella. *Purple Virgin's Bower.*—Varieties, Blue, Purple, Red, and Double Purple.
Glycine apios. *Tuberous-rooted Glycine.*
Glycine frutescens. *Shrubby Glycine*, or *Carolina Kidney-Bean Tree.*
Hedera helix. *Common Ivy.*—Varieties, Silver-striped, Gold-striped, Black-berried, Yellow-berried, Dwarf.
Hedera quinquefolia. *Five-leaved Ivy*, or *Virginian Creeper.*
Jasminum fruticans. *Common Yellow Jasmine.*
Jasminum officinale. *Common White Jasmine.* These are not properly Climbers, but require support. Jasminum scandens is a climber, but is not hardy, being a native of Bengal.
Lonicera caprifolium. *Italian Honeysuckle.*—Varieties, Early White, Yellow, Red, late Red, Evergreen late Red.
Lonicera periclymenum. *Common Honeysuckle*, or *Woodbine.*—Varieties, Late Red, Large Dutch Red, Long-blowing Dutch, Late-flowering German, Evergreen German, Striped-leaved, Oak-leaved, Variegated Oak-leaved.
Lonicera sempervirens. *Trumpet Honeysuckle*, or *Evergreen Scarlet T. H. of Virginia.*—Varieties, Great and Small.
Menispermum canadense. *Canadian Moon-seed.* 12 or 14 feet. Virginia, Canada, and Siberia. June and July.
Passiflora cœrulea. *Common* or *Blue Passion-flower.* Against a high south wall.
Periploca græca. *Common Virginian Silk.*
Rhamnus volubilis. *Twining Rhamnus.* Carolina. June and July.
Smilax aspera. *Rough Smilax.*

Smilax China. *Chinese Smilax.*
Smilax excelsa. *Tall Smilax.* Syria.
Smilax laurifolia. *Bay-leaved Smilax.* Virginia and Carolina.
Smilax rotundifolia. *Round-leaved Smilax.* Canada.
Smilax sarsaparilla. *Medicinal Smilax* or *Sarsaparilla.* America.
Smilax tamnoides. *Black Bryony-leaved Smilax.* N. Amer.
Solanum dulcamara. *Woody Nightshade,* or *Bittersweet.*—Varieties, White-flowered, Silver-striped, Gold-striped.

HARDY DECIDUOUS SHRUBS, INCLUDING SOME SMALL TREES COMMONLY CULTIVATED WITH SHRUBS IN ORNAMENTAL PLANTATIONS.

Acacia, Rose. See Robinia.
Althæa frutex. See Hibiscus.
Amorpha fruticosa. *Bastard Indigo.* Carolina.
Amygdalus nana. *Common Dwarf Almond.* Asia.
Amygdalus pumila. *Double-flowered Dwarf Almond.*
Andromeda acuminata. *Acute-leaved Andromeda.* N. Amer.
Andromeda arborea. *Tree Andromeda,* or *Sorrel-tree.* Virginia and Carolina, Asia and America.
Andromeda coriacea. *Thick-leaved Andromeda.* N. Amer.
Andromeda daboecia. *Trailing Andromeda, Irish Whorts,* or *Cantabrian Heath.* Ireland.
Andromeda ferruginea. *Rusty Andromeda.*
Andromeda mariana. *Maryland Andromeda.*—Varieties, Oval-leaved, Oblong-leaved.
Andromeda paniculata. *Panicled Andromeda.* Virginia.
Andromeda racemosa. *Branching* or *Pennsylvanian Andromeda.* Some of these are Evergreen.
Aralia nudicaulis. *Naked-stalked Aralia.* Virginia and Canada.
Aralia spinosa. *Thorny Aralia,* or *Angelica-tree.* Virginia.
Aristolochia arborescens. *Tree Birthwort.*
Artemisia abrotanum. *Southernwood.*
Ascyrum crux andreæ. *Common Ascyrum.*
Ascyrum hypericoides.
Ascyrum villosum.—All three natives of N. Amer.
Astragalus tragacantha. *Goat's-thorn.* S. Europe, &c.
Azalea nudiflora. *Naked-flowered Azalea.* N. Amer.—Varieties, deep Scarlet, deep Red, pale Red, early White, Red and White, Variegated, Downy.
Azalea procumbens. *Procumbent Azalea.* Europe.
Azalea viscosa. *Viscid Azalea.* N. Amer.—Varieties, Common White, Stripe-flowered, Narrow-petalled, Cluster-flowered, Glaucous.
Berberis vulgaris. *Common Barberry.*—Varieties, Purple-fruited, White-fruited, Canada Broad-leaved.
Berberis cretica. *Cretan* or *Box-leaved Barberry.*
Betula nana. *Smooth Dwarf Birch.* N. Europe.
Betula pumila. *American* or *Hairy Dwarf Birch.*
Broom. See Genista and Spartium.
Buckthorn. See Rhamnus.
Calycanthus floridus. *Carolina All-spice.* A warm situation and dry soil.—Varieties, Long-leaved and Round-leaved.
Cassioberry-bush. See Viburnum.
Ceanothus americanus. *New Jersey Tea.* Sheltered situation and dry soil.
Cephalanthus occidentalis. *American Button-wood.* Moist soil.
Chaste-tree. See Vitex.
Chionanthus virginica. *Virginian Fringe-tree,* or *Snowdrop-tree.* S. Carolina. Moist soil and sheltered situation.—Varieties, Broad or Ovate-leaved, and Narrow or Lance-leaved.
Clethra alnifolia. *Alder-leaved Clethra.* N. Amer.—Varieties, Smooth-leaved, and White underneath. Moist soil.
Colutea arborescens. *Common Bladder-Senna.* 12 or 14 feet. S. Europe.
Colutea cruenta. *Oriental Bladder-Senna.* 7 or 8 feet. Levant.
Colutea frutescens. *Scarlet Bladder-Senna.* 2 to 4 feet. Cape. Destroyed in severe winters.
Colutea Pocockii. *Pocock's Bladder-Senna.* 6 or 7 feet. Levant.
Coriaria myrtifolia. *Myrtle-leaved Sumach.* S. Europe. Sheltered situation.
Cornus alba. *White-berried Dogwood.* N. Amer. and Siberia.
Cornus alternifolia. *Alternate-leaved Dogwood.* N. Amer.—Variety, with red twigs.
Cornus florida. *Great-flowered* or *Virginia Dogwood.* 7 or 8 feet.—Variety, with a rose-coloured involucre.
Cornus mascula. *Cornelian Cherry.*
Cornus paniculata. *New Holland Dogwood.* N. Amer.
Cornus sanguinea. *Common Dogwood.* 4 or 5 to 8 or 10 feet. Europe.—Variety, with striped leaves.
Cornus sericea. *Blue-berried Dogwood.* 10 or 12 feet. N. Amer.
Cornus stricta. *Upright Dogwood.* 10 or 12 feet. N. Amer.
Coronilla emerus. *Scorpion Senna.* S. Europe.
Coronilla coronata. *Crowned Coronilla.* S. Europe.
Coronilla valentina. *Small Shrubby Coronilla.* Spain and Italy.
Cratægus azarolus. *Parsley-leaved Hawthorn* or *Azarole.* 20 feet.
Cratægus coccinea. *Great American Hawthorn.* 20 feet. Virginia and Canada.
Cratægus cordata. *Maple-leaved Hawthorn.* 4 feet. N. Amer.
Cratægus crus galli. *Cockspur Hawthorn.* 10 or 12 feet. N. Amer.
Cratægus elliptica. *Oval-leaved Hawthorn.* N. Amer.
Cratægus flava. *Yellow Pear-berried Hawthorn.* N. Amer.
Cratægus glandulosa. *Hollow-leaved Hawthorn.* North America.
Cratægus oxycantha. *Common Hawthorn* or *White-thorn.*—Varieties, Glastonbury, fine-leaved, Double-flowered, Great-fruited, Yellow-fruited, White-fruited.
Cratægus parvifolia. *Gooseberry-leaved Hawthorn.* 6 or 7 feet. Virginia.
Cratægus punctata. *Great-fruited Hawthorn.* America.—Varieties, with red fruit, with yellow fruit.
Cratægus pyrifolia. *Pear-leaved Hawthorn.* N. Amer.
Cratægus tomentosa. *Woolly-leaved Hawthorn.* N. Amer.—Variety, Carolina Hawthorn.
Cratægus viridis. *Green-leaved Virginian Hawthorn.* N. Amer.
Cytisus austriacus. *Austrian* or *Siberian Cytisus.* 4 feet. Austria, Hungary, Silesia, Italy, Siberia.
Cytisus biflorus. *Smooth Cytisus.* May.
Cytisus capitatus. *Cluster-flowered Cytisus.* Low. Austria and Silesia. June.
Cytisus divaricatus. *Clammy Cytisus.* S. France, Spain, and Madeira. July.
Cytisus Græcus. *Grecian Cytisus.* 6 or 7 feet. Archipelago. July.
Cytisus laburnum. *Laburnum.* See Trees. May.
Cytisus nigricans. *Black Cytisus.* 3 or 4 feet. Silesia, Austria, Hungary, Italy. July

Cytisus sessilifolius. *Common Cytisus*, or *Cytisus secundus Clusii.* 7 or 8 feet. S. of Europe. May.
Cytisus supinus. *Trailing Cytisus.* S. Europe and Siberia. May to August.
Cytisus Wolgaricus. *Wing-leaved Cytisus.* 2 feet. Siberia. These are ornamental shrubs, with yellow flowers.
Daphne alpina. *Alpine Daphne.* 3 feet. S. Europe.
Daphne cneorum. *Trailing Daphne.* Flowers early, sweet, red; sometimes white. S. Europe.
Daphne gnidium. *Flax-leaved Daphne.* 2 feet. S. Europe.
Daphne mezereum. *Mezereon.* 3 or 4 feet. Europe. Flowers in February or March.—Varieties, Crimson, pale red, purple, white with yellow berries, and with variegated leaves.
Daphne tartonraira. *Silvery-leaved Daphne.* Low. S. France.
Dirca palustris. *Marsh Leather-wood.* North America, in swamps.
Elæagnus angustifolia. *Narrow-leaved Oleaster.*
Elder. See Sambucus—Elder Marsh. See Viburnum.
Empetrum nigrum. *Black-berried Heath, Crow* or *Crake-berry.* Decumbent. N. Europe.
Ephedra distachya. *Great Shrubby Horsetail.* France and Spain.
Ephedra monostachya. *Small Shrubby Horsetail.* Siberia.
Epigæa repens. *Creeping Epigæa*, or *Trailing Arbutus.* Virginia and Canada.
Euonymus atropurpureus. *Purple-flowered Spindle-tree.* 6 feet. N. Asia.
Euonymus Europæus. *Common Spindle-tree.*
Euonymus latifolius. *Broad-leaved Spindle-tree.* Austria and Hungary.
Euonymus verrucosus. *Warted Spindle-tree.* Austria. The two first sorts may be trained as trees, and vary with white seeds. The leaves are often variegated.
Fothergilla alnifolia acuta. *Narrow-leaved Fothergilla.* Carolina.
Genista Anglica. *English Genista, Petty Whin*, or *Needle Furze.* Thorny. Britain.
Genista candicans. *Hoary Genista* or *Montpellier Cytisus.* 7 or 8 feet. S. Europe.
Genista florida. *Spanish Dyer's Genista* or *Broom.* 2 or 3 feet. Spain and Italy.
Genista Germanica. *German Genista* or *Broom.* 18 inches. Germany and S. Europe.
Genista Hispanica. *Dwarf prickly Genista* or *Broom.* 2 or 3 feet. Spain, S. France.
Genista Lusitanica *Portugal Genista* or *Broom.*
Genista pilosa. *Hairy Genista* or *Broom.* Procumbent. Europe. England.
Genista sagittalis. *Jointed Genista* or *Broom.* Procumbent.
Genista tinctoria. *Common Dyer's Genista* or *Broom.* 1 to 2 feet. Europe, England.
Halesia tetraptera. *Four-winged Halesia*, or *Snowdrop Tree.*
Hamamelis Virginica. *Witch-Hazel.* 2 to 3 feet. N. Amer.
Hawthorn. See Cratægus.
Hibiscus Syriacus. *Syrian Shrubby Hibiscus*, or *Althæa Frutex.*—6 or 7 feet. Syria. August.—Varieties, with Red, Red and White, Purple, pale Purple, Yellow and White flowers: with gold-striped and silver-striped leaves.
Hippophae Canadensis. *Canadian Sea Buckthorn.*
Hippophae rhamnoides. *Common Sea Buckthorn.* 8 or 10 feet. Europe, Tartary.
Honeysuckle. See Lonicera.
Hydrangea arborescens. *Shrubby Hydrangea.* 3 to 4 feet. Virginia and Canada.
Hypericum androsæmum. *Common Tutsan.* S. Europe and Britain.
Hypericum calycinum. *Great-flowered St. John's-wort*, or *Tutsan.* Constantinople.
Hypericum elatum. *Tall St. John's-wort.* N. Amer.
Hypericum hircinum. *Stinking Shrubby St. John's-wort.* 3 feet. S. Europe.—Varieties, Common or Great, and Smaller or Dwarf.
Hypericum olympicum. *Olympian St. John's-wort.* 1 foot. Levant.
Hypericum prolificum. *Proliferous St. John's-wort.* N. Amer. The flowers in all are yellow.
Jasminum fruticans. *Common Yellow Jasmine.* 8 or 10 feet, if supported. S. Europe and Levant.
Jasminum humile. *Italian Yellow Jasmine.*
Jasminum officinale. *Common White Jasmine.*—Varieties, Gold-striped, Silver-striped.
Itea Virginica. *Virginian Itea.* 6 or 7 feet.—Varieties, Greater and Smaller.
Iva frutescens. *Shrubby Iva*, or *Bastard Jesuit's Bark-tree.* 8 or 10 feet. Virginia and Peru.
Lavandula spica. *Common Lavender.*—Varieties, Narrow-leaved and Broad-leaved.
Lavandula stoechas. *French Lavender*, or *Stoechas.* S. Europe.
Laurus æstivalis. *Willow-leaved Bay.* N. Amer. Properly a green-house plant, but may be planted against a S. wall.
Ledum buxifolium. *Box-leaved Ledum.* Small. New Jersey and Carolina.
Ledum latifolium. *Broad-leaved Ledum*, or *Labrador Tea-tree.* 3 or four feet. Greenland, Hudson's-bay, Labrador, Newfoundland, and Nova Scotia.
Ledum palustre. *Marsh Ledum.* N. Europe.—A dwarf or decumbent Variety, from Hudson's Bay. These shrubs flower in April and May, and require a moist soil with bog earth.
Ligustrum vulgare. *Common Privet.* 6 feet. Europe.—Varieties, Gold-striped and Silver-striped, Broad-leaved, and Evergreen Italian Privet.
Lilac. See Syringa.
Lonicera alpigena. *Red-berried Upright Honeysuckle.* S. Europe. May.
Lonicera cærulea. *Blue-berried Upright Honeysuckle.* 3 to 5 feet. Switzerland, Austria, Siberia. April.
Lonicera caprifolium. *Italian Honeysuckle.* S. Europe.
Lonicera diervilla. *Yellow-flowered Upright Honeysuckle.* 3 feet. N. Amer.
Lonicera dioica. *Glaucous Honeysuckle.* N. Amer. June and July.
Lonicera implexa. *Minorca Honeysuckle.* June to September.
Lonicera nigra. *Black-berried Upright Honeysuckle.* 3 or 4 feet. March—May.
Lonicera periclymenum. *Common Honeysuckle.* Europe.—Varieties, Wild or Woodbine, late Red Dutch, Oak-leaved, &c.
Lonicera Tatarica. *Tartarian Upright Honeysuckle.* 3 or 4 feet. April.
Lonicera xylosteum. *Fly Honeysuckle.* 6 or 8 feet. Europe, Siberia, &c. May.
Lotus hirsutus. *Hairy Bird's-foot Trefoil.* S. Europe. 3 feet. June—August.
Lotus rectus. *Upright Bird's-foot Trefoil.* S. Europe. 3 or 4 feet. An Undershrub.
Lycium barbarum. *Willow-leaved Box-thorn.* Europe and Asia. Broad-leaved, Narrow-leaved. Scarcely to be called Hardy. Against a wall.
Marsh Elder. See Viburnum.

Mespilus arbutifolia. *Arbutus-leaved Mespilus.* 5 or 6 feet. Virginia. May.—Varies with red, black, and white fruit.
Mespilus Canadensis. *Snowy Mespilus.* 5 feet. Canada and Virginia. April and May.
Mespilus chamæ-mespilus. *Bastard Quince* or *Mespilus.* 4 or 5 feet. Europe.
Mespilus Cotoneaster. *Dwarf Mespilus.* 4 or 5 feet. Europe and Siberia. April and May.
Mespilus tomentosa. *Quince-leaved Mespilus.* April and May.
Mezereon. See Daphne.
Myrica cerifera. *American Candleberry.* Shrub or tree, 30 feet. N. Amer.—Variety, Broad-leaved.
Myrica faya. *Azorian Candleberry Myrtle.* Madeira and the Azores. June and July.
Myrica gale. *Sweet Gale* or *Sweet Willow.* 2 to 4 feet. N. Europe and America. May.
Ononis fruticosa. *Shrubby Rest-harrow.* 1 foot high. A beautiful low shrub. S. France. Flowers red or purple. May and June.
Osier. See Salix.
Philadelphus coronarius. *Syringa.* 7 or 8 feet. S. Europe. June.—Variety, Dwarf.
Potentilla fruticosa. *Shrubby Cinquefoil.* 3 or 4 feet. Ocland, England, Siberia, China, N. Amer. June and July.
Prinos verticillata. *Deciduous Winter Berry.* 8 or 10 feet. N. Amer. July.
Privet. See Ligustrum.
Prunus pumila. *Dwarf Canadian Cherry Tree.* 3 or 4 feet. Canada. May.
Ptelea trifoliata. *Three-leaved Ptelea* or *Shrubby Trefoil.* 10 or 12 feet. N. Amer.
Raspberry. See Rubus.
Rhamnus alpinus. *Alpine Buckthorn.* Germany, Switzerland, S. France, Piedmont.
Rhamnus alnifolius. *Alder-leaved Buckthorn.* N. Amer. May.
Rhamnus catharticus. *Purging Buckthorn.* 12 or 14 feet. Europe. May and June.
Rhamnus Frangula. *Berry-bearing Alder.* 10 or 12 feet. Europe and Siberia.
Rhamnus infectorius. *Dwarf* or *Yellow-berried Buckthorn.* Procumbent. S. Europe.
Rhamnus latifolius *Azorian Buckthorn.* Azores. July.
Rhamnus saxatilis. *Rock Buckthorn.* Low. Switzerland, Austria, S. France, Italy.
Rhodora Canadensis. *Canadian Rhodora* or *Rose-bay.* Newfoundland. 2 feet.
Rhus aromaticum. *Aromatic Sumach.* Carolina. May.
Rhus copallinum. *Lentiscus-leaved Sumach.* N. Amer. Aug. and Sept.
Rhus coriaria. *Elm-leaved Sumach.* S. Europe and Levant. July.
Rhus Cotinus. *Venice Sumach.* Italy and Austria. June and July.
Rhus elegans. *Carolina Sumach.* S. Carolina. July.
Rhus glabrum. *Scarlet Sumach.* N. America. July and August.
Rhus radicans. *Poison-oak* or *Sumach.* Virginia and Canada. June and July.—Varieties, Common Upright and Small-leaved.
Rhus suaveolens. *Sweet Sumach.* N. Amer. May.
Rhus toxicodendron. *Trailing Poison-oak* or *Sumach.* N. Amer. June and July.
Rhus typhinum. *Virginian Sumach,* or *Stag's-horn Tree.* Virginia and Carolina. July.
Rhus Vernix. *Varnish Sumach.* N. Amer. July.

Robinia Caragana. *Caragana.* Siberia. 20 feet. April and May.
Robinia chamlagu. *Shining Robinia.* China. May and June.
Robinia frutescens. *Shrubby Robinia.* Siberia. April and May.
Robinia halodendron. *Salt-tree Robinia.* Siberia.
Robinia hispida. *Rose Robinia* or *Rose Acacia.* Carolina. May—September.
Robinia pygmæa. *Dwarf Robinia.* Siberia. April and May. Weak and low.
Robinia spinosa. *Thorny Robinia.* Siberia. April and May. 6 or 7 feet.
Rosa alba. *White Rose.*—Varieties, Single, Double, Small Maiden's-blush, Great Maiden's-blush, Cluster Maiden's-blush.
Rosa alpina. *Alpine Rose.* Flowers single, red.
Rosa arvensis. *White Dog Rose.* Wild. Flower single.
Rosa blanda. *Hudson's Bay Rose.* May—August.
Rosa canina. *Dog Rose, Wild Briar,* or *Hep-tree.* Wild.—Varieties, White, Double.
Rosa Carolina. *Carolina Rose.* N. Amer. Red, Single.
Rosa centifolia. *Hundred-leaved Rose.* Flowers very double and deep red.—Varieties, Dutch, Blush, and Singleton's Hundred-leaved Rose. Burgundy, Single and Double Velvet, Sultan, Stepney, Garnet, Bishop, Lisbon.
Rosa cinnamomea. *Cinnamon Rose.* Single, Double. May.
Rosa damascena. *Damask Rose.* S. France. June and July.—Varieties, Red, Blush, York and Lancaster, Red, Monthly, White Monthly, Blush Belgic, Great Royal, Imperial Blush.
Rosa Gallica. *Red Rose.* S. Europe. June and July.—Varieties, Rosa Mundi, Marbled, Virgin.
Rosa lucida. *Shining-leaved American Rose.* Single. July.
Rosa lutea. *Single Yellow Rose.* Germany, S. France, Italy.—Variety, Red and Yellow Austrian.
Rosa moschata. *Musk Rose.* Africa. July.—Varieties, Single, Double. Flowers white in clusters.
Rosa muscosa. *Moss Provence Rose.* June and July.
Rosa parviflora. *Small-flowered American* or *Pennsylvanian Rose.*—Varieties, Single, Double.
Rosa pendulina. *Smooth Pendulous Rose.* Single. N. Amer. May.
Rosa pimpinellifolia. *Small Burnet-leaved Rose.* S. Europe, Asia. May and June.
Rosa provincialis. *Provence Rose.* Spain and Italy. June to August.—Varieties, Red or Scarlet, Blush, White, Rose de Meaux Great and Small, Blandford or Portugal.
Rosa pumila. *Dwarf Austrian Rose.* Austria and Italy. June and July.
Rosa rubiginosa. *Sweet Briar Rose.* Europe. May and June.—Varieties, Common Double, Mossy Double, Evergreen Double, Marbled Double, Red Double, Royal, and Yellow.
Rosa spinosissima. *Scotch Rose.* Europe. June and July. Single. White.—Varieties, Tall, Striped, Red, Double.
Rosa sulphurea. *Double Yellow Rose.* Levant. July.
Rosa tomentosa. *Downy-leaved Dog Rose.* Britain. June and July.
Rosa turbinata. *Frankfort Rose.*
Rosa villosa. *Apple Rose.* Europe and Asia. June.—Variety, Double.
Rosa acacia. See Robinia.
Rubus dalibarda. *Simple-leaved Bramble.*
Rubus fruticosus. *Bramble.* The variety with double flowers is introduced into ornamental plantations. Other

varieties, with white fruit, with cut leaves, with variegated leaves, and smooth without thorns.
Rubus hispidus. *Bristly Bramble.* Canada. August.
Rubus odoratus. *Flowering Raspberry.* N. Amer.
Rubus saxatilis. *Stone Bramble.* Europe. June.
Rubus villosus. *Hairy Bramble.* N. Amer. July.
Saint John's-wort. See Hypericum.
Salix. *Willow.*—Several of this genus have been given above among the Trees. Others belong to the Shrubs: as, Salix Purpurea. *Bitter Purple Willow.* 3 or 4 feet. Europe. It flowers at the end of February or in March.
Salix fissa. *Basket Osier.* 4 or 5 feet. Europe. Preferred for basket-work.
Salix rubra. *Green Osier.* England and France. Flowers in April and May. Excellent as an Osier.
Salix myrsinites. *Whortle-leaved Willow.*
Salix reticulata. *Round-leaved* or *Net-work Willow.* Europe, on mountains. May.
Salix myrtilloides. *Bilberry-leaved Willow.* Small. Sweden and Iceland, Switzerland, S. France, Ingria, and Siberia.
Salix aurita. *Round-eared Willow.* Europe. May.
Salix arenaria. *Sand Willow.* Europe.
Salix acuminata. *Long-leaved Sallow.* 6 feet. Europe. March and April.
Salix tristis. *Narrow-leaved American Willow.* Pennsylvania. April.
Salix viminalis. *Common Osier.* Europe. Much cultivated for the larger kinds of basket-work. There are many other shrubby species, but they are insignificant in cultivation, either for use or ornament.
Sambucus Canadensis. *Canadian Elder-tree.*
Sambucus nigra. *Common Elder-tree.*—Varieties, with green or white berries, and with cut leaves.
Sambucus racemosa. *Red-berried Elder.*
Sarsaparilla. See Smilax.
Sideroxylon lycioides. *Willow-leaved Ironwood.* Canada.
Smilax aspera. *Rough Smilax.* S. Europe and Syria. September.—Varieties, Simple-leaved, and Ear-leaved.
Smilax bona nox. *Ciliated Smilax.* N. Amer. June and July.
Smilax caduca. *Deciduous Smilax.* Canada.
Smilax lanceolata. *Spear-leaved Smilax.* N. Amer.
Smilax laurifolia. *Laurel-leaved Smilax.* Virginia and Carolina. July.
Smilax rotundifolia. *Round-leaved Smilax.* Canada. July and August.
Smilax Sarsaparilla. *Medicinal Smilax* or *Sarsaparilla.* America. July and August.
Smilax tamnoides. *Black Briony-leaved Smilax.* N. Amer. June and July.
Spartium decumbens. *Trailing Broom.* France and Switzerland. May and June.
Spartium junceum. *Spanish Broom.* S. Europe. July to September.—Variety, with double flowers.
Spartium monospermum. *White-flowered Single-seeded Broom.* Spain and Portugal. June and July.
Spartium multiflorum. *Portugal White Broom.* Portugal. May.
Spartium patens. *Woolly-podded Broom.* Portugal. June and July.
Spartium radiatum. *Starry Broom.* Italy. June and July.
Spartium scoparium. *Common Broom.* Europe. April—June.
Spartium Scorpius. *Scorpion Broom.* S. Europe. March and April.
Spartium sphærocarpum. *Yellow-flowered Single-seeded Broom.* S. Europe. June and July.
Spartium spinosum. *Prickly Broom* or *Prickly Cytisus.* S. Europe. June and July.
Spindle-tree. See Euonymus.
Spiræa crenata. *Hawthorn-leaved Spiræa.* Spain and Siberia. April and May.
Spiræa hypericifolia. *Hypericum-leaved Spiræa.* Hypericum Frutex, vulg. Canada. April and May.
Spiræa lævigata. *Smooth-leaved Spiræa.* Siberia. April--June.
Spiræa opulifolia. *Virginian Gelder Rose* or *Spiræa.* Canada and Virginia. June and July.
Spiræa salicifolia. *Willow-leaved Spiræa.* June to August.—Varieties, Flesh-coloured, Siberia. Panicled, and Broad-leaved. N. Amer.
Spiræa sorbifolia. *Service-leaved Spiræa.* Siberia. August.
Spiræa tomentosa. *Scarlet Spiræa.* Pennsylvania. August and September.
Staphylea pinnata. *Five-leaved Bladder-nut.* 10 or 12 feet. S. Europe. April—June.
Staphylea trifolia. *Three-leaved Bladder-nut.* Virginia. May and June.
Stuartia Malacodendron. *Common Stuartia.* Carolina and Virginia. July and August. 10 or 12 feet.
Sumach. See Rhus.
Syringa. See Philadelphus.
Syringa Persica. *Persian Lilac.* 5 or 6 feet. Persia. May.—Varieties, Blue, White, Cut-leaved.
Syringa vulgaris. *Common Lilac.* 18 or 20 feet. Persia. April and May.—Varieties, Blue, Purple, White.
Tamarix Germanica. *German Tamarisk.*—Tamarix Gallica, which is a middling Tree, is commonly cultivated among Shrubs.
Teucrium capitatum. *Round-headed Germander.* Spain. July and August.
Teucrium flavum. *Yellow-flowered Shrubby Germander.* S. Europe. July—September.
Teucrium lucidum. *Shining Germander.* S. Europe. June—September.
Teucrium marum. *Marum Germander*, or *Cat-thyme.* Spain. July—September. Dry warm situation.
Teucrium montanum. *Dwarf Germander.* France, Switzerland, Germany. July—October.
Teucrium Polium. *Poley* or *Sea Germander.* S. Europe and Levant. July—September. These are low shrubs. Several other species which are kept in the green-house, may be ventured abroad in a dry warm soil and situation, and will live through a mild winter.
Vaccinium amœnum. *Broad-leaved Whortle-berry.* N. Amer. May and June.
Vaccinium angustifolium. *Narrow-leaved Whortle-berry.* Newfoundland and Labrador. April and May.
Vaccinium diffusum. *Shining-leaved Whortle-berry.* S. Carolina. May—July.
Vaccinium frondosum. *Obtuse-leaved Whortle-berry.* N. Amer. June.
Vaccinium fuscatum. *Clustered-flowered Whortle-berry.* N. Amer. May and June.
Vaccinium myrtillus. *Common Blea-berry* or *Whortle-berry.* Europe, Britain. April.
Vaccinium pallidum. *Pale Whortle-berry.* N. Amer. May and June.
Vaccinium resinosum. *Clammy Whortle-berry.* N. Amer. May and June.
Vaccinium stamineum. *Green-wooded Whortle-berry.* N. Amer. May and June.
Vaccinium tenellum. *Gale-leaved Dwarf Whortle-berry.* N. Amer. May and June.

Vaccinium venustum. *Red-twigged Whortle-berry.* N. Amer. May and June.
Vaccinium virgatum. *Privet-leaved Whortle-berry.* N. Amer. April and May.
Vaccinium uliginosum. *Marsh Bilberry* or *Whortle-berry.* Europe, Britain. April and May.
Viburnum acerifolium. *Maple-leaved Viburnum.* Virginia. July.
Viburnum Cassinoides. *Thick-leaved Viburnum.* N. Amer. June.
Viburnum dentatum. *Tooth-leaved Viburnum.* N. Amer. June and July.—Varieties, Shining and Downy.
Viburnum Lantana. *Common Wayfaring-tree.* Europe, Britain, June.—Variety, Large-leaved. N. Amer.
Viburnum lævigatum. *Cassioberry-bush.* Carolina. July and August.—This is V. Cassinoides of *Mill. dict.* and Casseno Peragua. *Linn. mant.*
Viburnum Lentago. *Pear-leaved Viburnum.* N. America. July.
Viburnum nitidum. *Shining-leaved Viburnum.* N. America. May and June.
Viburnum nudum. *Oval-leaved Viburnum.* N. Amer. May and June.
Viburnum opulus. *Marsh Elder* or *Viburnum.* Europe, Britain. May and June.—Variety, Snowball Viburnum, or Gelder-rose.
Viburnum prunifolium. *Plum-leaved Viburnum.* N. Amer. May and June.
Vitex Agnus castus. *Officinal Chaste-tree.* 8 or 10 feet. S. Europe, Asia, Africa, Virginia.—Variety, Broad-leaved.
Wayfaring-tree. See Viburnum.
Whortleberry. See Vaccinium.
Willow. See Salix.

HARDY EVERGREEN SHRUBS.

Adam's-needle. See Yucca.
Alaternus. See Rhamnus. Alexandrian Laurel. See Ruscus.
Andromeda polifolia. *Marsh Andromeda.* 6 inches to a foot. America, N. Europe, Britain. May.—Varieties, Broad-leaved, Narrow-leaved.
Andromeda axillaris. *Notch-leaved Andromeda.* Carolina. May to August.
Andromeda caliculata. *Calicled Andromeda.* Sweden, Siberia, N. Amer.—Varieties, Globe-flowered, Broad-leaved, Narrow-leaved.
Arbutus Acadiensis. *Acadian Strawberry-tree.* Low. N. Amer. in swamps.
Arbutus alpina. *Alpine Arbutus.* Trailing. Europe, Scotland, Siberia. May.
Arbutus andrachne. *Oriental Strawberry-tree.* It grows to a middle-sized tree, but with us is cultivated among shrubs. Levant, Syria, Greece, Crete.
Arbutus thymifolia. *Thyme-leaved Arbutus.* N. Amer. in swamps.
Arbutus unedo. *Common Strawberry-tree.* 20 to 30 feet, but commonly branching from the bottom, and cultivated as a shrub. S. Europe, Ireland, Asia.—Varieties, with white, red, and double flowers; with leaves curled, cut, smooth, broad and narrow; with oval fruit.
Arbutus uva ursi. *Trailing Arbutus* or *Bear-berry.* Trailing. Europe, Britain, Siberia.
Bay. See Laurus.—Butcher's-broom. See Rucus.
Buxus sempervirens. *Box.* Commonly cultivated as a shrub. See the varieties among the Trees.
Cistus albidus. *White-leaved Cistus* or *Rock Rose.* Spain and France. June and July. Flowers purple.
Cistus anglicus. *Hairy Cistus.* England and Wales. June and July. Flowers yellow.
Cistus apeninus. *Apennine Cistus.* Mountains of Italy. June—August. Flowers white.
Cistus canus. *Myrtle-leaved Dwarf Cistus.* S. Europe, June and July. Flowers yellow.
Cistus creticus. *Cretan Cistus.* Levant. June and July, Flowers Rose-purple.
Cistus crispus. *Curled-leaved Cistus* or *Rock-rose.* Portugal. June and July. Flowers white.
Cistus halimifolius. *Sea Purslane-leaved Cistus.* Portugal. June and July. Flowers yellow.
Cistus helianthemum. *Dwarf Cistus.* Europe, Britain. May—September. Flowers full yellow, varying to lemon-colour, white, and even rose-colour.
Cistus incanus. *Hoary-leaved Cistus* or *Rock-rose.* S. Europe. June—August. Flowers purple.
Cistus ladaniferus. *Spanish Gum Cistus.* Spain and Portugal. June and July. Flowers white, or with a large purple spot at the base of each petal.—Varieties, with waved leaves, and flat leaves.
Cistus laurifolius. *Laurel-leaved Cistus.* Spain. June and July. Flowers white.
Cistus laxus. *Broad Waved-leaved Cistus.* Spain and Portugal. June and July. Flowers white.
Cistus marifolius. *Marum-leaved Cistus.* S. Europe. May and June. Flowers white.
Cistus Monspeliensis. *Montpellier Cistus.* S. France and Spain. July. Flowers white.
Cistus polifolius. *Mountain Cistus.* S. Europe and England. May and June. Flowers white.
Cistus populifolius. *Poplar-leaved Cistus.* Portugal. May and June. Flowers white.—Varieties, Greater and Smaller.
Cistus salvifolius. *Sage-leaved Cistus* or *Rose.* S. Europe. June and July. Flowers white.
Cistus scabrosus. *Rough Cistus.* Italy and Portugal. June and July. Flowers yellow.
Cistus serpyllifolius. *Serpyllum-leaved Cistus.* Austria. May—September. Flowers yellow.
Cistus surreianus. *Small-flowered Cistus.* England. July—October. Flowers yellow.
Cistus thymifolius. *Thyme-leaved Cistus.* France and Spain. June and July. Flowers yellow.
Cistus umbellatus. *Umbelled Cistus.* France and Spain. June—August. Flowers white. Most of these Shrubs are low, and some trailing. C. ladaniferus incanus, and some others, are beautiful, but somewhat tender, and the flowers fall in a few hours.
Cneorum tricoccum. *Widow-wail* or *Spurge Olive.* 2 or 2 feet and a half. S. Europe. May.
Cranberry. Vaccinium.
Cytisus hirsutus. *Hairy* or *Evergreen Cytisus.* 8 or 10 feet. S. Europe and Siberia. June.
Daphne laureola. *Spurge Laurel.* 2 or 3 feet. S. Europe, Britain. February.
Erica arborea. *Tree Heath.* S. Europe and Madeira. February—May.
Erica australis. *Spanish Heath.* Spain and Portugal. April and May.
Erica Mediterranea. *Mediterranean Heath.* S. Europe. March—May.
Erica multiflora. *Many-flowered Heath.* S. Europe. June—November.
Erica tetralix. *Cross-leaved Heath.* Britain. June—August. Flowers red; variety with white flowers.

Erica vulgaris. *Common Heath.* Europe. June—August. Variety with white flowers, and double flowers.
Euonymus Americanus. *Evergreen Spindle-tree.* 8 or 10 feet. July.
Furze. See Ulex.
Gaultheria procumbens. *Trailing Gaultheria.* Canada.
Heath. See Erica.
Holly. See Ilex.
Honeysuckle. See Lonicera.
Jerusalem Sage. See Phlomis.
Ilex Aquifolium. *Holly.* See among the Trees: but all the varieties are cultivated among Shrubs. May and June.
Ilex cassine. *Dahoon Holly.* August.
Ilex opaca. *Carolina Holly.* May and June.
Ilex vomitoria. *South-sea Tea.* See Trees.
Juniperus communis. *Common Juniper.*—Varieties, Swedish Juniper, Upright, and Mountain or Procumbent Juniper. Europe.
Juniperus Oxycedrus. *Broom-berried Juniper.* Spain and Portugal. May and June.
Juniperus Phœnicea. *Phenician Cedar* or *Juniper.* S. Europe, and Levant. May and June.
Juniperus sabina. *Savin.* S. Europe and Levant.—Varieties, Tamarisk-leaved Savin, and Striped-leaved.
Kalmia angustifolia. *Narrow-leaved Kalmia.* N. Amer. May to July.—Varieties, dark-red and pale-red flowers.
Kalmia glauca. *Glaucous Kalmia.* Newfoundland. April and May.
Kalmia latifolia. *Broad-leaved Kalmia.* N. Amer. May—July.
Laurel. See Prunus.
Laurel, Alexandrian. See Ruscus.
Laurus nobilis. *Common Sweet Bay.* See Trees. The Broad-leaved is less hardy than the Narrow-leaved, and is commonly cut down in severe winters.
Laurustinus. See Viburnum.
Ledum buxifolium. *Box-leaved Ledum.* Carolina and New Jersey. April and May.
Ledum latifolium. *Broad-leaved Ledum* or *Labrador Tea.* April and May
Ledum palustre. *Marsh Ledum.* N. Europe.—A dwarf or decumbent variety from Hudson's Bay.
Ligustrum Italicum. *Italian* or *Evergreen Privet.* A variety of L. vulgare, or common Privet, which frequently retains its leaves.
Lonicera grata. *Evergreen Honeysuckle.* N. Amer. June.
Lonicera implexa. *Minorca Honeysuckle.* June to September.
Lonicera sempervirens. *Trumpet Honeysuckle.* N. Amer. May to August.—Varieties, Great and Small.
Mespilus Pyracantha. *Pyracantha* or *Evergreen Thorn.* S. Europe. May.
Myrica cerifera. *Evergreen Candleberry Myrtle.* N. Amer. May and June.
Phillyrea angustifolia. *Narrow-leaved Phillyrea.*—Varieties, Rosemary-leaved and Dwarf.
Phillyrea latifolia. *Broad-leaved Phillyrea.*—Vari. Smooth, Prickly, and Ilex-leaved.
Phillyrea media. *Middle Phillyrea.*—Varieties, Privet-leaved, Long-branched, Drooping, Olive-leaved, and Box-leaved.
These Shrubs are all natives of the south of Europe, and flower in May and June.
Phlomis fruticosa. *Shrubby Phlomis* or *Jerusalem Sage.* Spain and Sicily. June.—Varieties, Broad-leaved, Narrow-leaved.
Phlomis Italica. *Blunt-leaved Purple Phlomis.* Italy and Portugal. June to August.
Phlomis purpurea. *Sharp-leaved Purple Phlomis.* Spain. June.
Prinos glabra. *Evergreen Winter-berry.* Canada. July and August.
Prinos lucida. *Shining Winter-berry,* July.
Prunus laurocerasus. *Common Laurel.* Levant. April.—Varieties, Narrow-leaved, Gold and Silver-striped.
Prunus Lusitanica. *Portugal Laurel.* 20 feet. Portugal. June.
Pyracantha. See Mespilus.
Rhamnus Alaternus. *Common Alaternus.* S. Europe. April to June.—Varieties, Broad-leaved, Jagged-leaved, Blotched, Silver-striped, Gold-striped.
Rhododendrum Dauricum. *Dotted-leaved Rhododendron.* Siberia.
Rhododendrum ferrugineum. *Rusty-leaved Rhododendron.* Alps. May—July.
Rhododendrum hirsutum. *Hairy Rhododendron.* Alps. May and June.
Rhododendrum maximum. *Broad-leaved Rhododendron.* N. Amer. June—August.
Rhododendrum ponticum. *Purple Rhododendron.* Levant and Gibraltar. May and June.
Rosmarinus officinalis. *Officinal Rosemary.* 8 or 10 feet. S. Europe, Levant, and Barbary. June—May. Varieties, Broad and Narrow-leaved, Silver-striped and Gold-striped.
Ruscus aculeatus. *Prickly Butcher's-broom.* Europe, Asia, Africa. March and April.
Ruscus hypoglossum. *Double-leaved Butcher's-broom.* Hungary and Italy. April and May.
Ruscus hypophyllum. *Broad-leaved Butcher's-broom.* Italy. May and June.
Ruscus racemosus. *Alexandrian Laurel.* Portugal. June.
Ruta graveolens. *Common Rue.* S. Europe. June to Sept.
Ruta montana. *Mountain Rue.* S. Europe. Aug. and Sept.
Santolina Chamæcyparissus. *Lavender Cotton.* S. Europe July.—Varieties, Hoary, Dark-green and Dwarf or Decumbent.
Santolina rosmarinifolia. *Rosemary-leaved Lavender Cotton.* Spain. July to September.
Spurge-Laurel. See Daphne.—Strawberry-tree. See Arbutus.
Thymus mastichina. *Mastick Thyme.* Spain.
Thymus serpyllum. *Wild Thyme.* Europe. Varieties, Smooth, Hoary, Hairy, Lemon.
Thymus Virginicus. *Virginian* or *Savory Thyme.* N. Amer. July.
Thymus vulgaris. *Garden Thyme.* S. Europe. May—August.—Varieties, Narrow-leaved, Broad-leaved.
Vaccinium macrocarpon. *American Cranberry.* N. Amer. May.
Vaccinium oxycoccus. *European Cranberry.* Europe. May and June.
Vaccinium vitis idæa. *Red Bilberry,* or *Whortleberry.* Europe. April and May.
Viburnum tinus. *Laurustinus* or *Laurestine.* S. Europe. Winter.—Varieties, Hairy, Shining, Upright.
Vinca. *Periwinkle.*
Ulex Europæus. *Common Furze.* It flowers great part of the year.
Ulex nanus. *Dwarf Furze.* August to October.
Winter-berry. See Prinos.—Whortleberry. See Vaccinium.
Yucca aloifolia. *Aloe-leaved Adam's Needle.* S. America. August and Sept. This is rather a green-house plant.
Yucca draconis. *Drooping-leaved Adam's Needle.* S. Carolina. Oct. and Nov.
Yucca filamentosa. *Thready Adam's Needle.* Virginia. Sept. and Oct.
Yucca gloriosa. *Superb Adam's Needle.* Amer. July and Aug.

CATALOGUE OF HARDY BULBOUS PLANTS.

N. B. THESE ARE ALL PERENNIAL.

AGAVE Virginica. *Virginian Agave.* September.
Aletris farinosa. *American Aletris.* N. Amer. June.
Allium angulosum. *Angular-stalked Garlic.* Germany and Siberia. May.
Allium descendens. *Purple-headed Garlic.* Switzerland. July.
Allium flavum. *Sulphur-coloured Garlic.* Austria. June and July.
Allium inodorum. *Carolina Garlic.* March and April.
Allium lineare. *Linear-leaved Garlic.* Siberia. June.
Allium magicum. *Homer's Garlic,* or *Moly.* June and July.
Allium moly. *Yellow Garlic,* or *Moly.* S. Europe. June.
Allium nigrum. *Broad-leaved Garlic.* Austria. June and July.
Allium nutans. *Flat-stalked Garlic.* Siberia. July.
Allium obliquum. *Oblique-leaved Garlic.* Siberia. June.
Allium pallens. *Pale-flowered Garlic.* S. Europe. June and July.
Allium paniculatum. *Panicled Garlic.* S. Europe and Levant.
Allium parviflorum. *Small-flowered Garlic.* S. Europe.
Allium roseum. *Rose Garlic.* S. France. June.
Allium senescens. *Narcissus-leaved Garlic.* Germany and Siberia. June and July.
Allium Sibiricum. *Siberian Garlic.* Siberia and N. Amer. July and Aug.
Allium sphærocephalon. *Small Round-headed Garlic.* Italy, Switzerland, Siberia. July.
Allium subhirsutum. *Hairy Garlic,* or *Dioscorides's Moly.* S. Europe and Levant. May.
Allium triquetrum. *Triangular Garlic.* Spain. May and June.
Allium tricoccum. *Three-seeded Garlic.* N. Amer. July.
Allium victorialis. *Long-rooted Garlic.* Alps. May.
Allium ursinum. *Ramsons.* Europe, Britain. April and May.
Amarillis Atamasco. *Atamasco Lily.* N. Amer. May. 6 to 8 inches. White.
Amaryllis lutea. *Yellow Amaryllis,* or *Autumnal Narcissus.* S. Europe. September. 4 to 6 inches.
Anthericum liliago. *Grass-leaved Anthericum.* S. Europe. May and June. 18 to 24 inches. White.
Anthericum liliastrum. *Savoy Anthericum* or *Spiderwort.* Alps. May and June. 12 to 18 inches. White.
Anthericum ramosum. *Branching Anthericum.* S. Europe. May and June. 18 to 24 inches. White.
Anthericum serotinum. *Mountain Anthericum.* Britain. June and July. White within, red without.
Arethusa bulbosa. *Bulbous-rooted Arethusa.* N. Amer. May.
Asphodelus altaicus. *Channelled-leaved Asphodel.* Siberia. May and June.
Asphodelus fistulosus. *Onion-leaved Asphodel.* S. Europe. May and June.
Asphodelus luteus. *Yellow Asphodel.* Sicily. May to July. 2 to 3 feet.
Asphodelus ramosus. *Branching Asphodel.* S. Europe. May and June. 3 to 5 feet. White.
Atamasco Lily. See Amaryllis.
Bulbocodium vernum. *Spring-flowering Bulbocodium.* Spain. March. 4 to 5 inches. Dark blue.
Colchicum autumnale. *Meadow Saffron.* Europe, Britain. Sept. and Oct. 4 to 6 inches. Pale Purple, White, and Striped; with double flowers, and variegated leaves.
Commelina erecta. *Upright Commelina.* Virginia. Aug. and Sept. 18 inches. Pale blue.
Convallaria bifolia. *Least* or *Two-leaved Solomon's Seal.* N. Europe. May and June. 4 to 5 inches.
Convallaria latifolia. *Broad-leaved Solomon's Seal.* N. Amer. May and June.
Convallaria majalis. *Lily of the Valley.* Europe, Britain. May and June. 6 to 9 inches. White, varying with double and with red flowers.
Convallaria multiflora. *Broad-leaved* or *Many-flowered Solomon's Seal.* Europe, England. May and June. 2 to 3 feet. Greenish white.
Convallaria polygonatum. *Common Solomon's Seal.* Europe, England. May and June. 2 feet. Greenish white.
Convallaria racemosa. *Cluster-flowered Solomon's Seal.* N. Amer. May and June. 18 to 24 inches. White.
Convallaria stellata. *Star-flowered Solomon's Seal.* Virginia and Canada. May and June.
Convallaria verticillata. *Whorl-leaved Solomon's Seal.* N. Europe. England. May and June. 12 to 18 inches. Greenish white.
Corn-flag. See Gladiolus.
Crocus officinalis. *Saffron.* Levant. Sept. and Oct. 3 to 4 inches. Blue.
Crocus vernus. *Spring Crocus.* S. Europe. March. 3 to 6 inches. Variety of colours.
Crown Imperial. See Fritillaria.
Cypripedium acaule. *Two-leaved Lady's Slipper.* N. Amer. May.
Cypripedium album. *White Lady's Slipper.* N. Amer. June and July.
Cypripedium calceolus. *Common Lady's Slipper.* Europe, England. May to July. 1 foot. Purple and Yellow.
Daffodil. See Narcissus.
Day Lily. See Hemerocallis.
Dog-tooth Violet. See Erythronium.
Erythronium dens canis. *Dog's-tooth Violet.* Italy, Siberia, Virginia. March. 5 to 6 inches. Purple, varying to White.
Fly Orchis. See Ophrys.
Fritillaria imperialis. *Crown Imperial.* Persia. March and April. 2 to 3 feet. Red, Yellow, &c.
Fritillaria meleagris. *Common Fritillary.* Europe, England. April and May. 9 to 12 inches. Yellow, white, purple.
Fritillaria Persica. *Persian Fritillary* or *Lily.* Persia? April and May. 2 to 3 feet. Dark purple.
Fritillaria Pyrenaica. *Pyrenean Fritillary.* May. 18 to 24 inches. Dark purple.
Galanthus nivalis. *Snowdrop.* Europe, Britain. February and March.
Garlic. See Allium.
Gladiolus communis. *Common Corn-flag.* S. Europe. June and July. 18 to 24 inches. Red, varying to flesh-colour and white.

Harebells. See Scilla.
Helleborine. See Serapias.
Helonias asphodeloides. *Grass-leaved Helonias.* N. Amer. May and June. 18 to 24 inches. White.
Helonias bullata. *Spear-leaved Helonias.* N. Amer. April and May. 12 to 18 inches. Purple.
Hemerocallis flava. *Yellow Day Lily.* Siberia and Hungary. June. 2 to 3 feet.
Hemerocallis fulva. *Copper-coloured Day Lily.* Levant. July and Aug. 3 to 4 feet.
Hyacinthus amethystinus. *Amethyst-coloured Hyacinth.* Spain and Italy. April and May.
Hyacinthus botryoides. *Blue Grape Hyacinth.* Italy. April. 6 to 9 inches. Dark blue.
Hyacinthus cernuus. *Nodding Hyacinth.* Spain. April and May. 9 to 12 inches. Purplish.
Hyacinthus comosus. *Purple Grape Hyacinth.* S. Europe. May. 6 to 9 inches. Bluish purple.
Hyacinthus muscari. *Musk Hyacinth.* Levant. April and May. 5 to 6 inches. Bluish green.
Hyacinthus monstrosus. *Feathered Hyacinth.* S. Europe. May and June. 5 to 6 inches. Bluish purple.
Hyacinthus orientalis. *Garden Hyacinth.* Levant. March and April. 12 to 18 inches. White, Red, Blue, &c. Double.
Hyacinthus racemosus. *Clustered Grape Hyacinth.* S. Europe. April. 6 to 9 inches. Pale blue.
Hyacinthus Romanus. *Roman Grape Hyacinth.* Italy. May.
Hyacinthus serotinus. *Late-flowering Hyacinth.* Spain and Barbary. June.
Hypoxis erecta. *Upright Hypoxis.* N. Amer. June.
Jonquill. See Narcissus.
Iris aphylla. *Naked-stalked Iris,* or *Flower-de-luce.* May and June. 2 feet. Purple and white stripes.
Iris arenaria. *Sand Iris.* Hungary.
Iris biflora. *Two-flowered Iris.* Portugal and Spain. April and May. 1 foot. Deep purple.
Iris Chinensis. *Chinese Iris.* June.
Iris cristata. *Crested Iris.* N. Amer. May. Blue and yellow.
Iris dichotoma. *Forked Iris.* Siberia. August.
Iris flexuosa. *Zigzag Iris.* Siberia. June and July.
Iris Florentina. *Florentine Iris.* S. Europe. May. 18 inches. White.
Iris fœtidissima. *Stinking Iris* or *Gladwyn.* Europe, Britain. June. 12 to 18 inches. Dirty purple variegated. —Variety with striped leaves.
Iris Germanica. *German Iris.* May. 3 feet. Faint purple and light blue.
Iris graminea. *Grass-leaved Iris.* Austria. June. 9 inches. Purple and blue with yellow stripes.
Iris halophila. *Long-leaved Iris.* Siberia. July.
Iris lurida. *Dingy Iris.* S. Europe. June. Purple and yellow.
Iris lutescens. *Yellowish Iris.* Germany. April.
Iris ochroleuca. *Pale Yellow Iris.* Levant. July.
Iris pallida. *Pale Iris.* Levant. May.
Iris Persica. *Persian Iris.* March. 4 to 5 inches. Pale blue, variegated with dark purple and yellow.
Iris pseudacorus. *Yellow Iris* or *Flag.* Europe, Britain. June.
Iris pumila. *Dwarf Iris.* Austria. April. 5 to 6 inches. Pale purple, red, and variegated.
Iris sambucina. *Elder-scented Iris.* S. Europe. June. 3 to 4 feet. Pale blue.
Iris sanguinea. *Bloody Iris.* Siberia. May and June.
Iris Sibirica. *Siberian Iris.* Siberia, Austria, Switzerland. May and June.
Iris sisyrinchium. *Crocus-rooted Iris.* Spain and Portugal. May. 9 to 12 inches. Purple with yellow.
Iris spathacea. *Sheathed Iris.* Cape. July.
Iris spuria. *Spurious Iris.* Germany. July. 18 inches. Pale blue and purple variegated.
Iris squalens. *Brown-flowered Iris.* Germany. June. 2 feet. Violet with soiled yellow.
Iris Susiana. *Chalcedonian Iris.* Levant. March and April. 18 to 24 inches. Black and white.
Iris tenuifolia. *Slender-leaved Iris.* Dauria. May and June.
Iris tuberosa. *Snake's-head Iris.* Arabia. March and April. 9 to 12 inches. Dark purple.
Iris variegata. *Variegated Iris.* Hungary. May and June. 9 to 12 inches. Yellow and brownish purple striped with white.
Iris versicolor. *Various-coloured Iris.* N. Amer. June. 1 foot. Pale blue and purple variegated with white.
Iris Virginica. *Virginian Iris.* N. Amer. June. 1 foot. Deep blue with purple.
Iris xyphum. *Bulbous-rooted Iris.* S. Europe. June. 12 to 18 inches.—Variety of beautiful colours; another with a broader leaf.
Ixia bulbocodium. *Crocus-leaved Ixia.* Alps. March and April.
Lady's Slipper. See Cypripedium.
Lady's Traces. See Ophrys.
Leontice thalictroides. *Columbine-leaved Leontice.* N. Amer. May.
Leucoium æstivum. *Summer Leucoium.* Europe, England. May and June. 12 to 18 inches. White.
Leucoium autumnale. *Autumnal Leucoium.* Portugal. September.
Leucoium vernum. *Spring Leucoium.* Germany, Switzerland, Italy. March. 8 to 12 inches. White edged with greenish-yellow.
Lilium bulbiferum. *Orange Lily.* Italy, Austria, Siberia. June and July. 18 inches to 3 feet and a half.
Lilium Camschatcense. *Kamtchatka Lily.* May. 12 to 18 inches. Dark yellow.
Lilium Canadense. *Canadian Martagon Lily.* N. Amer. July and Aug. 3 to 4 feet. Yellow spotted with black.
Lilium candidum. *White Lily.* Levant. June and July. 3 to 4 feet. White.—Varieties, with variegated leaves, double flowers, and striped with purple.
Lilium Catesbæi. *Carolina Lily.* July and Aug.
Lilium Chalcedonicum. *Scarlet Martagon Lily.* Levant. June and July. 2 to 3 feet.
Lilium cordifolium. *Heart-leaved Lily.* Japan. May to July.
Lilium martagon. *Purple Martagon Lily.* Europe. June and July.—Varieties, with double, white, and spotted flowers.
Lilium Philadelphicum. *Philadelphian Martagon Lily.* N. Amer. July.
Lilium pomponium. *Pomponian Lily.* Siberia and the Pyrenees. May and June. 18 to 24 inches. Bright Red, Scarlet, and Yellow.
Lilium superbum. *Great Yellow Martagon Lily.* N. Amer. June and July. 4 to 5 feet. Orange with dark spots.
Lily. See Amaryllis.
Lily of the Valley. See Convallaria.
Limodorum tuberosum. *Tuberous-rooted Limodorum.* N. Amer. July.
Melanthium lætum. *Spear-leaved Melanthium.* N. Amer. June.

Melanthium Virginicum. *Virginian Melanthium.* N. Amer. June and July. 12 to 18 inches. Greenish White.
Moly. See Allium.
Narcissus albus. *White Narcissus.* Spain.
Narcissus angustifolius. *Narrow-leaved Narcissus.* Europe, Britain.
Narcissus bicolor. *Two-coloured Narcissus.* Spain. White and deep yellow.
Narcissus biflorus. *Two-flowered Narcissus.* Europe, Britain.
Narcissus bulbocodium. *Hoop-petticoat Narcissus.* Portugal.
Narcissus compressus. *Flat-stalked Narcissus.* Spain.
Narcissus crenulatus. *Crenulated Narcissus.* Spain.
Narcissus elatior. *Tall Narcissus.* Portugal.
Narcissus incomparabilis. *Peerless Narcissus.* Portugal.
Narcissus inflatus. *Inflated Narcissus.* Spain.
Narcissus Jonquilla. *Jonquill.* Spain.—Variety, Double.
Narcissus major. *Great Narcissus.* Spain.
Narcissus minor. *Small Narcissus.* Spain. Yellow.
Narcissus odorus. *Sweet-smelling Narcissus.* Portugal.
Narcissus orientalis. *Eastern Narcissus.* Levant.
Narcissus poeticus. *Poet's Narcissus.* Europe, Britain.
Narcissus pseudo-narcissus. *Daffodil.* Europe, Britain.
Narcissus Sibthorpii. *Sibthorp's Narcissus.* Europe, Britain.
Narcissus tazetta. *Polyanthus Narcissus.* Spain and Portugal. White or Yellow, many varieties.
Narcissus tenuifolius. *Slender-leaved Narcissus.* Spain.
Narcissus tenuior. *Slender Narcissus.* Spain.
Narcissus tereticaulis. *Round-stalked Narcissus.* Spain.
Narcissus tortuosus. *Twisting-flowered Narcissus.* Spain.
Narcissus triandrus. *Rush-leaved Narcissus.* Portugal. White. These bulbs flower from March to May.
Ophrys anthropophora. *Green Man Ophrys.* Britain. May.
Ophrys apifera. *Bee Ophrys.* Britain. June and July.
Ophrys aranifera. *Spider Ophrys.* Britain. April.
Ophrys cordata. *Heart-leaved Ophrys.* Britain. July.
Ophrys lilifolia. *Lily-leaved Ophrys.* N. Amer. June.
Ophrys Loeselii. *Loesel's Ophrys.* Britain. July.
Ophrys monorchis. *Yellow* or *Musk Ophrys.* Britain. July.
Ophrys muscifera. *Fly Ophrys.* Britain. May and June.
Ophrys nidus avis. *Bird's Nest Ophrys.* Britain. May.
Ophrys ovata. *Tway-blade.* Britain. May and June.
Ophrys spiralis. *Triple Lady's Traces.* Britain. August.
Orchis bifolia. *Butterfly Orchis.* Britain. May and June.
Orchis ciliaris. *Ciliated Orchis.* N. Amer. July.
Orchis conopsea. *Aromatic Orchis.* Britain. June.
Orchis coriophora. *Lizard Orchis.* England. June.
Orchis fimbriata. *Fringed Orchis.* Canada and Newfoundland. July.
Orchis fusca. *Brown Orchis.* Britain. June.
Orchis militaris. *Man Orchis.* England. May and June.
Orchis pyramidalis. *Pyramidal Orchis.* Britain. June and July.
Orchis ustulata. *Dwarf Orchis.* England. May and June.
Ornithogalum luteum. *Yellow Star of Bethlehem.* Europe, Britain. March and April.
Ornithogalum minimum. *Small Star of Bethlehem.* Sweden.
Ornithogalum nutans. *Neapolitan Star of Bethlehem.* Italy. April and May.
Ornithogalum pyramidale. *Pyramidal Star of Bethlehem.* Spain and Portugal. June and July.
Ornithogalum pyrenaicum. *Pyrenean Star of Bethlehem.* Pyrenees, England. June and July.
Ornithogalum stachyoides. *Close-spiked Star of Bethlehem.* S. Europe. June and July.
Ornithogalum striatum. *Striped-flowered Star of Bethlehem.* Siberia. May.
Ornithogalum umbellatum. *Umbelled Star of Bethlehem.* Europe, England. May and June.
Ornithogalum uniflorum. *One-flowered Star of Bethlehem.* Siberia.
Pancratium Illyricum. *Illyrian Pancratium.* S. Europe. May and June.
Pancratium maritimum. *Sea Pancratium.* S. Europe. May. White.
Pontederia cordata. *Heart-leaved Pontederia.* Virginia. July and August. Blue.
Satyrium albidum. *White Satyrion.* England. June and July.
Satyrium hircinum. *Lizard Satyrion.* England. June and July.
Satyrium nigrum. *Black-flowered Satyrion.* Switzerland, Austria, Lapland. June.
Satyrium repens. *Creeping Satyrion.* Scotland. August.
Satyrium viride. *Green* or *Frog Satyrion.* Europe, Britain. June and July.
Scilla amœna. *Nodding Squill.* Levant. March and April.
Scilla autumnalis. *Autumnal Squill.* England. August.
Scilla bifolia. *Two-leaved Squill.* France and Germany, England. March.
Scilla campanulata. *Bell-shaped Squill.* Spain. May and June.
Scilla Italica. *Italian Squill.* April to June.
Scilla Lusitanica. *Portugal Squill.* May.
Scilla nutans. *Harebell.* Europe, Britain. April to June.
Scilla Peruviana. *Peruvian Squill.* Spain and Portugal. May and June.
Scilla præcox. *Early-flowering Squill.* April and May.
Scilla verna. *Small Squill.* England. June and July.
Serapias ensifolia. *Sword-leaved Helleborine.* July.
Serapias grandiflora. *Great-flowered Helleborine.* June.
Serapias latifolia. *Broad-leaved Helleborine.* July.
Serapias longifolia. *Long-leaved Helleborine.* July.
Serapias palustris. *Marsh Helleborine.* July.
Serapias rubra. *Red-flowered Helleborine.* August.
All natives of Britain.
Sisyrinchium anceps. *Grass-leaved Sisyrinchium.* Virginia. June and July.
Sisyrinchium Bermudiana. *Bermudian Sisyrinchium.* Bermudas. May and June.
Sisyrinchium striatum. *Yellow-flowered Sisyrinchium.* Mexico. June to Sept.
Snowdrop. See Galanthus.
Solomon's-seal. See Convallaria.
Spiderwort. See Tradescantia.
Squill. See Scilla.
Star of Bethlehem. See Ornithogalum.
Tradescantia Virginica. *Virginian Spiderwort.* Virginia and Maryland. May to August.
Trillium cernuum. *Drooping-flowered Trillium.*
Trillium erectum. *Upright-flowered Trillium.*
Trillium sessile. *Sessile-flowered Trillium.*
All natives of N. America; flowering in April and May.
Tulipa gesneriana. *Garden Tulip.* Levant. April and May. Innumerable varieties.
Tulipa sylvestris. *Yellow Tulip.* S. Europe. England. April and May.
Twayblade. See Ophrys.
Uvularia amplexifolia. *Heart-leaved Uvularia.* Germany. May.
Uvularia lanceolata. *Spear-leaved Uvularia.* N. Amer. July.
Uvularia perfoliata. *Perfoliate Uvularia.* N. Amer. May.
Uvularia sessilifolia. *Sessile-leaved Uvularia.* N. Amer. June.

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D.

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E.

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F.

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G.

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Gleets, see Pinus Larix, 328.

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Griping, see Mentha Viridis, 115; Mimosa Nilotica, 132; Pimpinella Anisum, 320; Symphytum Officinale, 641. See *Colic*.

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H.

Hæmorrhage, see Osmunda Lunaria, 217; Papaver Somniferum, 240; Polygonum Aviculare, 378; Potentilla Reptans, 393; Poterium Sanguisorba, 394; Psychotria Emetica, 421; Rubus Fruticosus, 494; Sisymbrium Sophia, 582; Urtica Dioica, 780. See *Bleeding* and *Styptic*.

Hæmoptysis. See *Spitting of Blood*.

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Head, Disorders of the, see Lavandula Spicata, 18; Lepidium Latifolium, 33; Pæonia Officinalis, 229; Primula Vulgaris, 398; Tanacetum Balsamita, 647; Teucrium Marum, 655; Viola Tricolor, 754. See *Cephalics*.

Head, sore, see Lupinus Albus, 63; Mentha Viridis, 115. See *Scald Head*.

Heartburn. See *Stomachics*.

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I.

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J.

Jaundice, see Lemna Minor, 30; Ligusticum Levisticum, 39; Lupinus Albus, 63; Mentha Pulegium, 116; Menyanthes Trifoliata, 117; Morus Nigra, 141; Nigella Damascena, 172; Onopordum Acanthium, 194; Origanum Vulgare, 209; Orobanche Major, 212; Osmunda Regalis, 217; Parietaria Officinalis, 244; Pastinaca Sativa, 253; Polygonum Hydropiper, 377; Potentilla Reptans, 393; Rhamnus Frangula, 457; Rubia Tinctorum, 488; Santolina Chamæcyparissus, 526; Spartium Scoparium, 608; Veronica Officinalis, 739; Veronica Beccabunga, 740; Urtica Dioica, 780.

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K.

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L.

Leprous Eruptions, see Nymphæa Lutea, 180; Veratrum Album, 731; Ulmus Campestris, 773.
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Lungs, Obstructions of the, see Linum Usitatissimum, 45; Liquidambar Styraciflua, 49; Marrubium Vulgare, 90; Pimpinella Anisum, 320; Pulmonaria Officinalis, 425; Scabiosa Succisa, 535; Styrax Benzoin, 638; Tamus Communis, 646; Teucrium Chamædrys, 656; Verbascum Thapsus, 732.
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M.

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N.

Narcotics, see Nicotiana Tabacum, 170; Papaver Rhœas, 239; Papaver Somniferum, 240; Passiflora Murucuja, 251; Solanum Nigrum, 596
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Nervous Headache, see Lavandula Spica, 18; Origanum Vulgare, 209. See *Headache.*
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O.

Obstructions of the Liver, see Lemna Minor, 30; Morus Nigra, 141. See *Liver Complaints.*
Obstructions of the Viscera, see Leontodon Taraxacum, 31; Ligusticum Levisticum, 39; Nicotiana Tabacum, 170; Ocimum Basilicum, 184; Ononia Spinosa, 191; Origanum Marjorana, 209; Osmunda Regalis, 217; Pastinaca Sativa, 253; Pastinaca Opoponax, 254; Pimpinella Magna, 319; Rubia Tinctorum, 488; Ruta Graveolens, 503; Santolina Chamæ-cyparissus, 526; Scandix Cerefolium, 538; Sisymbrium Nasturtium, 581; Tanacetum Vulgare, 647; Veronica Officinalis, 739; Urtica Dioica, 780. See *Viscera.*
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P.

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Palsy, see Laurus Camphora, 22; Sinapis Nigra, 579.
Paralysis, see Lavandula Spicata, 18; Laurus Nobilis, 24; Pinus Larix, 328; Piper Nigrum, 335; Tamus Communis, 646; Urtica Dioica, 780.
Pectorals. See *Breast, Disorders of the.*
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Perspiration, see Ligusticum Levisticum, 39; Papaver Somniferum, 240; Psychotria Emetica, 421; Salvia Officinalis, 519. See *Sudorific.*
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Plantago Major, 346; Polygala Amara, 373; Verbascum Thapsus, 732.

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Q.

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Quinsey, see Papaver Rhœas, 239; Ribes Nigrum, 472. See *Putrid Sore Throat*.

R.

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Retchings, see Mentha Viridis, 115. See *Vomitings*.

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Ringworm. See *Cutaneous Eruptions*.

Ruptures, see Osmunda Lunaria, 217; Polygonum Bistorta, 376.

S.

Scabs, see Veratrum Album, 731. See *Itch*.

Scalds, see Lilium Candidum, 40; Morus Nigra, 141.

Scald Head, see Viola Tricolor, 753; Ulmus Campestris, 773. See *Head*.

Sciatica, see Lepidium Iberis, 33; Pinus Larix, 328; Senecio Jacobæa, 562; Sinapis Nigra, 579; Thalictrum Flavum, 660.

Scorbutic Complaints, see Laurus Sassafras, 26; Menyanthes Trifoliata, 117; Polypodium Vulgare, 381; Portulacca Oleracea, 390; Ribes Rubrum, 470; Rumex Aquaticus, 500; Saxifraga Tradactylites, 534; Sedum Acre, 556. See *Antiscorbutic*.

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Small Pox, see Papaver Somniferum, 240; Tormentilla Erecta, 680.

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Solids, Strengthening the. See *Tonics*.

Sores, see Potentilla Reptans, 393; Salvia Sclarea, 522. See *Ulcers*.

Spasms, see Laurus Camphora, 23; Mentha Viridis, 115; Olea Europæa, 189; Papaver Somniferum, 240; Ricinus Communis, 474; Valeriana Officinalis, 727. See *Colic*.

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APPENDIX

TO THE

BOTANICAL DICTIONARY.

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THE CLASSES;

OR, PRIMARY DIVISIONS OF THE SEXUAL SYSTEM.

N. B. SEE THE PLATE.

Fig.
1.—MONANDRIA, ... Flowers with 1 Stamen.
2.—DIANDRIA, ... —————— 2 Stamens.
3.—TRIANDRIA, ... —————— 3 Stamens.
4.—TETRANDRIA, ... —————— 4 Stamens, all of the same length.
5.—PENTANDRIA, ... —————— 5 Stamens.
6.—HEXANDRIA, ... —————— 6 Stamens, all of the same length.
7.—HEPTANDRIA, ... —————— 7 Stamens.
8.—OCTANDRIA, ... —————— 8 Stamens.
9.—ENNEANDRIA, ... —————— 9 Stamens.
10.—DECANDRIA, ... —————— 10 Stamens.
11.—DODECANDRIA, ... —————— 12 Stamens.
12.—ICOSANDRIA, ... Flowers with about 20 Stamens, attached to the Calix, or sometimes, in part, to the Corolla.
13.—POLYANDRIA, ... Flowers most commonly with more than 20 Stamens, attached to the Receptacle.

Fig.
14.—DIDYNAMIA, ... Flowers with 2 longer Stamens.
15.—TETRADYNAMIA, .. Flowers with 4 longer Stamens.
16.—MONADELPHIA, ... Filaments united into one brotherhood.
17.—DIADELPHIA, ... Filaments forming two brotherhoods.
18.—POLYADELPHIA, .. Filaments forming more than two brotherhoods.
19.—SYNOENESIA, ... Anthers united, composing a hollow cylinder, through which the Style passes.
20.—GYNANDRIA, ... Stamens on the Pistil.
21.—MONŒCIA, ... Staminiferous and Pistiliferous flowers on the same plant.
22.—DIŒCIA, ... Staminiferous and Pistiliferous flowers on different plants.
23.—POLYGAMIA, ... Different dispositions on the same plant.
24.—CRYPTOGAMIA, ... Flowers inconspicuous.

THE ORDERS;

OR, SECONDARY DIVISIONS OF THE SEXUAL SYSTEM.

Fig.
1. *Monogynia*, containing hermaphrodite flowers with one pistil, or female organ.
2. *Digynia*, hermaphrodite flowers with two pistils;—*a*, the pistils detached from the flower.
3. *Trigynia*, hermaphrodite flowers with two pistils;—*a*, the pistils separated.
4. *Tetragynia*, hermaphrodite flowers with four pistils;—*a*, the pistils separated.
5. *Pentagynia*, hermaphrodite flowers with five pistils;—*a*, the pistils separated.
6. *Hexagynia*, hermaphrodite flowers with six pistils;—*a*, the pistils separated from the flower.
7. *Heptagynia*, hermaphrodite flowers with seven pistils;—*a*, the pistils detached from the flower.
8. *Decagynia*, hermaphrodite flowers with ten pistils;—*a*, the pistils separated.
9. *Dodecagynia*, hermaphrodite flowers with twelve pistils, or female organs.

Fig.
10. *Polygynia*, hermaphrodite flowers containing an indefinite number of pistils, or female organs.
11. *Gymnospermia*, the name of the first order in the class DIDYNAMIA,—in which *a* represents a longitudinal section of the flower, to display the four naked seeds in the bottom of the calix.
12. *Angiospermia*, the name of the second order in the class DIDYNAMIA, containing such hermaphrodite flowers with four stamens, two longer than the others, as have their seeds contained in a vessel;—*a*, the pericarp, or vessel.
13. *Siliculosa*, the first order in the class TETRADYNAMIA, containing such flowers possessed of the classical character, as have their seeds contained in a short round pod;—*a*, the *silicula*, or pod, divided to shew the seeds.
14. *Siliquosa*, the second order in the class TETRADYNAMIA, containing such flowers possessed of the classical

Fig.

character, as have their seeds contained in a *siliqua*, or long slender pod, to each suture of which they are alternately attached;—*a*, the *siliqua*.

15. *Polygamia Æqualis*, the first order in the class SYNGENESIA;—*a*, a floret separated from the aggregate.
16. *Polygamia Superflua*, the second order in the class SYNGENESIA;—*a*, represents a female floret in the circumference or ray; *b*, an hermaphrodite floret in the centre or disk.
17. *Polygamia Frustranea*, the third order in the class SYNGENESIA.
18. *Polygamia Necessaria*, the fourth order in the class SYNGENESIA.
19. *Polygamia Segregata*, the fifth order in the class SYNGENESIA;—*a*, a floret with its proper flower-cup detached from the aggregate.

Fig.

20. *Monogamia*, the sixth order in the class SYNGENESIA;—*a*, representing a section of the flower, to exhibit the union of the stamens by the anthers.
21. 22. 23. *Triœcia*, the third order in the class POLYGAMIA, in which hermaphrodite flowers are intermingled with male or female flowers, or both, on one, two, or three plants.
24. *Filices*, Ferns, the first order,
25. *Musci*, Mosses, the second order,
26. *Algæ*, Sea-weed, &c. the third order,
27. *Fungi*, Mushrooms, the fourth order,

in the class CRYPTOGAMIA.

In the class CRYPTOGAMIA two other orders are reckoned, viz. HEPATICÆ, small herbaceous plants resembling Mosses; and MISCELLANEÆ, including plants not easily referable to any of the five foregoing orders.

TABLE OF GENERA;

OR, THE

CLASSES AND ORDERS OF PLANTS,

WITH THEIR ESSENTIAL CHARACTERS.

CLASS I.—MONANDRIA.

This Class consists of Plants having one Stamen only in each Flower, with the Pistil, or Pistils

1. MONOGYNIA *(One Pistil.)*

1. *Trilocular, such as have the Pericarp divided into three Loculaments.*

CANNA, *Indian Shot*—Corolla six-parted, erect; lip two-parted, revolute; style lanceolate, growing to the corolla; calix three-leaved.

AMOMUM, *Ginger*—Calix trifid, unequal, cylindric; corolla three-parted, unequal, spreading; nectary two-lipped, almost erect.

COSTUS—Corolla inflated, ringent, the lower lip trifid.

ALPINIA—Calix three-toothed, equal, tubulose; corolla three-parted, equal; nectary two-lipped, the lower lip spreading.

MARANTA, *Indian Arrow-Root*—Calix three-leaved; corolla trifid; nectary three-parted, the third part bearing the anthers on its upper side.—Or, calix of three leaves; corolla of one petal, in five segments; anthers simple, on the edge of the filament; style petal-like; stigma somewhat triangular; nut solitary, of three cells.

CURCUMA, *Turmeric*—Stamens, four barren, a fifth fertile; corolla four-parted; nectary three-lobed.

KÆMPFERIA, *Galangale*—Corolla six-parted, three of the parts larger, spreading, one or two parted; stigma two-plaited.

KALIA—Calix three-leaved; corolla five-petalled, the two inner petals less; nectary lanceolate, concave; drupe with a one-celled nut.

MYROSMA—Calix double, outer three-leaved, inner three-parted; corolla five-parted, irregular; capsule three-cornered, three-celled, many-seeded.

2. *Monospermous, such as have a single Seed.*

BOERHAAVIA, *Hog-weed*—Calix small, entire; corolla one-petalled, bell-shaped, plaited; seed one, naked, inferior; stamens one, two, or three.

SALICORNIA, *Jointed Glasswort*—Calix ventricose, entire; petals none; stamens one or two; seed one, covered by the calix.

HIPPURUS, *Mare's-tail*—Calix a two-lobed rim to the germen; corolla none; stigma simple; seed one, inferior.

MITHRIDATEA, *Drum-tree*—Calix, common four-cleft, enlarged, fleshy, containing the seeds; corolla none; fruit globular, depressed; seeds solitary, arilled.

ZOSTERA, *Grass Wrack*—Spadix linear, sheathed by the base of a leaf, bearing the flowers on one side; perianth and corolla none; anther sessile; stigmas two, linear; capsule with one seed.

* * * * * * * * * *

HEDYCHIUM—Anther two-lobed, recurved, terminal, embracing the style, without any appendage; outer border of the corolla in three equal linear lobes; inner in three parts, two-lipped; flowers reversed; tube longer than the border.

LOPEZIA—Calix superior, of four unequal leaves; corolla irregular, of four petals; nectary stalked, folded, opposite

to the stamen; capsule of four cells and four valves; seeds numerous.

PHILYDRUM—Spathe one-flowered; perianth none; corolla four-petalled, irregular; capsule three-celled, many-seeded.

PHRYNIUM—Calix three-leaved; corolla, inner segments four, obtuse, unequal; nectary, tube filiform; border four-parted; capsule three-celled; nuts three.

POLLICHIA—Calix of one leaf, five-toothed; corolla five-petalled; seed solitary; receptacle producing succulent aggregate scales, sustaining the fruit.

QUALEA—Calix four-parted; corolla two-petalled; berry with many-seeds.

USTERIA—Calix four-toothed, with one segment much longer than the rest; corolla funnel-form, four-parted; capsule two-celled, with inflexed partitions; seeds imbricated, winged.

ZINGIBER, *Ginger*—Anther two-lobed; filament elongated beyond the anther, with an awl-shaped channelled beak, embracing the style; outer border of the corolla ringent, inner a three-lobed lip.

2. DIGYNIA *(Two Pistils.)*

CORISPERMUM, *Tickseed*—Calix none; pistils two; seed one, oval, naked.

CALLITRICHE, *Star-headed Water Chickweed*—Calix none; petals two; capsule two-celled, four-seeded.

BLITUM, *Strawberry-Blite*—Calix trifid; petals none; seed one, with a berried calix.

MNIARIUM—Calix four-parted, superior; corolla none; seed one.

LACISTEMA—Calix, scale of the ament; corolla four-parted; filaments bifid; berry pedicelled, one-seeded.

CINNA—Calix glume two-valved, one-flowered; corolla glume two-valved; seed one.

CLASS II.—DIANDRIA.

Consisting of Plants with two Stamens only, in the same Flower, with the Pistil or Pistils.

1. MONOGYNIA *(One Pistil.)*

1. *Such as have regular Corollas.*

NYCTANTHES, *Arabian Jesmine*—Corolla salver-shaped, with truncated segments; capsule two-celled, margined; seed solitary.

JASMIMUM, *Jasmine*—Corolla salver-shaped; berry dicoccous; seeds solitary, arillated.

LIGUSTRUM, *Privet*—Corolla four-cleft; berry four-seeded.

PHILLYREA, *Mock Privet*—Calix four-toothed; corolla four-cleft; berry or drupe two-celled; seeds solitary.

OLEA, *Olive*—Calix four-cleft, with subovate segments; drupe one-seeded.

CHIONANTHUS, *Snowdrop Tree*, or *Fringe Tree*—Corolla quadrifid, with the divisions extremely long; drupe with a striated nut.

SYRINGA, *Lilac*—Calix four-toothed; corolla tubular, four-cleft; capsule two-celled, two-valved.

DIALIUM—Calix none; corolla five-petalled; stamens at the upper side of the receptacle.

ERANTHEMUM—Corolla five-cleft; tube thread-shaped; anthers projecting beyond the tube; stigmas simple; fruit uncertain.

CIRCÆA, *Enchanter's Nightshade*—Corolla two-petalled; calix two-leaved, superior; seed one, two-celled.

WULFENIA—Corolla tubular, ringent; upper lip vaulted, lower three-cleft; calix in five deep segments; capsule of two cells, and two cloven valves.

2. *Such as have irregular Corollas, and the fruit angiospermous.*

VERONICA, *Speedwell*—Corolla four-cleft, wheel-shaped, with the lowest segment narrower; capsule superior, two-celled.

PÆDORATA—Corolla four-cleft; calix five-parted; capsule two-celled.

JUSTICIA, *Malabar-nut*—Corolla ringent; capsule two-celled, opening with an elastic claw; stamens with a single anther.

DIANTHERA—Corolla ringent; capsule two-celled, bursting with an elastic aril; stamens each a pair of alternate anthers.

GRATIOLA, *Hedge Hyssop*—Calix seven-leaved, the two outer patulous; corolla irregular, reversed; stamens two barren; capsule two-celled.

SCHEVENKIA—Corolla almost equal, with the throat plaited and glandular; stamens three barren; capsule two-celled, many-seeded.

PINGUICULA, *Butterwort*—Corolla ringent, with a spur; calix two-lipped, five-cleft; capsule one-celled.

UTRICULARIA, *Bladderwort*—Corolla ringent, spurred; calix two-leaved, equal; capsule one-celled.

CALCEOLARIA—Corolla ringent, inflated; capsule two-celled, two-valved; calix four-parted, equal.

GLOBBA—Calix superior, trifid; corolla equal, trifid; capsule three-celled; seed very many.

3. *Such as have irregular Corollas, and the fruit gymnospermous.*

VERBENA, *Vervain*—Corolla funnel-shaped, almost equal, curved; calix five-toothed, one of them truncate; seeds two or four, naked or very thinly arilled; stamens two or four.

LYCOPUS, *Water Horehound*—Corolla four-cleft, with one division emarginate; stamens distant; seeds four, retuse.

AMETHYSTEA—Corolla quinquefid, the lower division more spreading; stamens approximated; calix subcampanulate; seeds four, gibbous.

ZIZIPHORA, *Syrian Field Basil*—Corolla ringent, its upper lip reflexed, flat, undivided; calix thread-shaped; seeds four.

MONARDA, *Oswego Tea*—Corolla irregular, the upper lip linear, involving the filaments; seeds four.

ROSMARINUS, *Rosemary*—Corolla unequal, with the upper lip two-parted; filaments long, curved, simple, with a tooth.

SALVIA, *Sage*—Calix somewhat bell-shaped, two-lipped; corolla ringent; filaments fastened transversely to a pedicel; seeds four, naked.

COLLINSONIA, *Knot Root*—Corolla unequal; calix of the fruit one-leafed, toothed; of the flower, bifid; seed one, under the calix of the flower.

MORINA—Calix of the fruit one-leafed, toothed; of the flower, bifid; corolla irregular; seed one, under the calix of the flower.

ANCISTRUM—Calix four-leaved; corolla none; stigma many-parted; drupe dry, hispid, one-celled.

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CATALPA, *Catalpa Tree*—Calix two-parted; corolla campanulate; tube ventricose; border four-lobed, unequal;

stamens two fertile; filaments three sterile; stigma bilamellate; capsule silique-form, long, cylindric, two-valved; seed membranaceously margined and tufted at the extremities.

Cunila, *Mountain Dittany*—Corolla ringent, upper lip erect, flat; filaments two, barren; seeds four.

Elytraria—Calix coriaceous, four-parted, the anterior divisions cleft; corolla five-cleft; stigma ligulate; capsule oblong, two-celled, two-valved; valves half-septiferous.

Fontanesia—Calix in four deep segments; petals two, deeply divided; capsule superior, membranaceous, not oursting, of two cells; seeds solitary, pendulous.

Forsythia—Calix in four deep segments; corolla bell-shaped, four-cleft; fruit?

Galipæa—Calix inferior, tubular, four or five cleft; corolla tubular; border in five deep spreading segments; two stamens abortive; germen superior, angular.

Ghinia—Calix five-toothed; teeth acuminate; corolla two-lipped; stamens four, with two barren anthers at the end of the shorter filaments; pericarp a drupe, containing a four or five celled nut, with a seed in each cell.

Leptandra—Calix five-parted, segments acuminate; corolla tubular-campanulate; border four-lobed; stamens, and at length the pistil, much exserted; filaments below, and tube of the corolla, pubescent; capsule ovate, acuminate, two-celled, many-seeded, opening at the summit.

Hedeorna, *Wild Pennyroyal*—Calix bilabiate, gibbous at the base, upper lip gibbous at the base, upper lip three-toothed, lower two-toothed; corolla ringent; stamens two sterile; the fertile ones about the length of the corolla.

Lindernia—Calix five-parted, nearly equal; corolla tubular, bilabiate, upper lip short, emarginate, lower trifid, unequal; filaments four, the two longer forked, and sterile; stigma bilamellate; capsule two-celled, two-valved.

Lithophila—Calix three-leaved; corolla three-petalled; nectary two-leaved.

Linociera—Calix four-toothed; corolla four-petalled; anthers connecting two opposite petals at the base; berry two-celled.

Micranthemum—Calix four-parted; corolla four-parted, almost bilabiate, the upper lamina smaller than the rest; filaments incurved, shorter than the corolla; capsule nearly globular, one-celled, two-valved, many-seeded; seeds striated.

Monotropa, *Yellow Bird's Nest*—Calix none; petals ten, the five outer hollowed, melliferous at the base; capsule five-valved: a fifth part excluded in some.

Ornus, *Flowering Ash*—Calix four-parted; corolla four-parted; petals long and ligulate; filaments long; nut winged.

Pimelea—Calix none; corolla four-cleft; stamens inserted into the throat; nut covered with a bark, one-celled.

Schrebera—Calix two-lipped; corolla from five to seven cleft; capsule pear-shaped, two-celled, two-valved; seeds from eight to ten, membranaceous, winged.

Sciurus—Calix five-cleft, short; corolla unequal, with the upper lip trifid, the lower bifid and shorter; stamens five, but three barren; capsules five, united, one-celled.

2. DIGYNIA *(Two Pistils.)*

Anthoxanthum, *Vernal Grass*—Calix glume two-valved, one-flowered; corolla glume two-valved, acuminate; seed one.

Crypsis—Calix glume two-valved, one-flowered; corolla glume two-valved, awnless.

3. TRIGYNIA *(Three Pistils.)*

Piper, *Pepper*, and *Betel*—Calix none; corolla none; berry one-seeded.

Cherleria—Calix five-leaved; nectaries five, bifid, resembling petals; anthers alternate, barren; capsule one-celled, three-valved, three-seeded.

CLASS III.—TRIANDRIA.

Consisting of Plants having three unconnected Stamens, in the same Flower with the Pistil or Pistils.

1. MONOGYNIA *(One Pistil.)*

1. *Those whose Flowers have no Spathe or Ament.*

Valeriana, *Valerian*—Calix none; corolla one-petalled, gibbous on one side of the base, superior; seed one.

Olax—Calix entire (trifid, according to Gærtner); corolla funnel-form, trifid; nectaries four, (three, Gærtner); berry three-celled, many-seeded.

Willichia—Calix four-cleft; corolla four-cleft; stamens in three of its clefts; capsule superior, of two cells, with many seeds.

Tamarindus, *Tamarind Tree.*—See *Monadelphia Triandria.*

Rumphia—Calix three-cleft; petals three; drupe coriaceous; nut three-celled.

Cneorum, *Widow-wail*—Calix three-toothed; petals three, equal; berry tricoccous.

Camocladia, *Maiden Plum*—Calix three-parted; corolla three-parted; drupe oblong, with a two-lobed nucleus.

Melothria, *Creeping Cucumber*—Calix bell-shaped, five-cleft; corolla wheel-shaped, one-petalled; berry three-celled, many-seeded.

Ortegia—Calix five-leaved; corolla none; capsule one-celled; seeds very many.

Læflingia—Calix five-leaved; corolla five-petalled, very small; capsule one-celled, three-valved.

Polycnemum—Calix five-leaved; corolla none; style divided; capsule membranous, not bursting; seed one, almost naked.

Hippocratea—Calix five-parted; petals five; capsules three, obcordate, or elliptic.

Rotala—Calix three-toothed; corolla none; capsule three-celled, many-seeded.

Witsenia—Calix none; corolla with a cylindric tube; border in six deep, equal, obtuse segments; stigma slightly three-cleft; capsule of three cells, with several angular seeds.

Pommereulla—Calix turbinate, two-valved, three or four flowered; valves four-cleft, awned at the back; corolla two-valved, awned.

Dilatris—Calix none; corolla six-petalled, hirsute; filaments, one less than the others; stigma simple.

2. *Such as have Spathaceous Flowers, and a trilocular Capsule.*

Crocus, *Saffron*—Corolla six-parted, equal; stigmas convolute.

Ixia—Corolla one-petalled, tubular; tube straight, filiform; border six-parted, bell-shaped, regular, or nearly so; stigmas three or six, simple.

Gladiolus, *Corn Flag*—Corolla six-parted, irregular, unequal; stigmas three.

Antholyza—Corolla tubular, irregular, recurved; capsule inferior.

Iris, *Flower-de-luce*—Corolla six-petalled, unequal; petals alternate, jointed and spreading; stigmas petal-form, cowled, two-lipped.

Morœa—Corolla six-petalled, the three inner parts spreading, narrow; stigma trifid.

Wachendorfia—Corolla inferior, irregular, of six petals, two of them spurred at the base; capsule of three cells; seed solitary, rough.

Commelina, *Day-flower*—Corolla six-petalled; nectaries three, cross-shaped, pedicelled.

Callisia—Calix three-leaved; petals three; anthers double; capsule two-celled.

Xyris—Calix of three unequal leaves, the two lateral ones permanent; petals three, equal; nectaries three, feathery; capsule superior, of three valves, with central receptacles; seeds numerous.

3. *Such as have an imbricated Ament, and are gymnospermous.*

Schœnus, *Bog Rush*—Glumes chaffy, one-valved, heaped, the outer ones barren; corolla none; seed one, roundish, among the glumes.—Or, Scales of the calix collected into a spike, the inferior ones empty; corolla none; style deciduous.

Cyperus, *Galingale, Papyrus, Cyprus Grass*—Glumes chaffy, imbricate, in two rows; corolla none; seed one, naked.

Scirpus, *Club Rush*—Glumes chaffy, imbricate every way; corolla none; seed one, beardless.

Eriophorum, *Cotton Grass*—Glumes chaffy, imbricated every way; corolla none; seed one, invested with very long hairs.

Lygeum, *Bastard Matweed*—Corolla two on the same germen; nut two-celled.

Nardus, *Mat Grass*—Calix none; corolla two-valved.

Ryllingia—Ament ovate, or oblong, imbricate; flowers with a bivalve calix and corolla.

Fuirena—Spike imbricated, with abrupt awned scales; corolla of three obcordate awned valves; seed solitary, triangular, beardless.

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Aristea—Petals six; style declinate; stigma funnel-form, gaping; capsule inferior, with many seeds.

Calymenia—Involucre caliciform, five-parted, persistent, enlarging, and then peltate-campanulate, one to three or five flowered; proper calix none; corolla sub-campanulate, plaited, five-parted; stamens exserted; seed one, coriaceously coated, obconic, with five furrows.

Dichroma—Spike capitate, involucrate; glumaceous scales on all sides imbricated into sessile crowded spikelets, the lower scales empty; corolla none; style setaceous, bifid; seed somewhat lenticular, terminated by the triangular persistent base of the style.

Dulichium—Spikes somewhat racemose, axillary; spikelets linear-lanceolate, rather compressed; calicine scales subulate; style very long, bifid; involute setæ long and scabrous; seed acuminated by the base of the style.

Eriocoma, *Silk Grass*—Calix two-valved, one-flowered; corolla two-valved, roundish; valves coriaceous, vested with a silky wool, the outer valve terminated by a short triquetrous deciduous awn; anthers bearded; seed large, somewhat spherical.

Fedia—Calix three or four toothed; corolla tubular, five-cleft; capsule crowned with the persistent calix, three-celled, one only of the cells usually fertile.

Ficus.—See *Polygamia Dicœcia.*

Fimbristylus, *Club Rush*—Glumes chaffy, imbricated every way; corolla none; style cloven, bulbous at the bottom, compressed, fringed at each edge; seed solitary, without any bristles at its base.

Lapeyrousia—Spathe of one or two folded valves; corolla salver-shaped; border in six deep segments, shorter than the tube; stigmas three, deeply divided; capsule membranaceous, triangular, with many globular seeds.

Leptanthus—Spathe one to four flowered; corolla tube long and slender, border six-parted; stamens seated upon the segments of the corolla; anthers linear; capsule enclosed in the spathe, three-celled, many-seeded, opening at the angles.

Limnetis—Flowers in unilateral spikes, almost imbricated in two rows; calix two-valved, carinate and compressed, one much smaller than the other; corolla two-valved, awnless; styles long, one or two; seed compressed.

Macrolobium—Calix double, outer two-leaved, inner one-leafed; petals five, upper very large, the four other very small, equal; germen pedicelled.

Mapania—Flowers capitate, subtended by a large three-leaved involucre; calix none; corolla six-valved, valves toothed and imbricated; stigmas three; seed intimately enveloped by a chaffy six-parted involucel.

Marica—Corolla six-parted, with three alternate segments as small again as the others; stigma petal-form, trifid, with the three divisions simple, acute; capsule three-celled, inferior.

Mariscus—Spikelets five-flowered, almost imbricately aggregated in roundish or subcylindric heads; common calix of the spikelets two-valved, three to six or eight-flowered; flowers one-valved, subimbricate; style trifid; seed triquetrous.

Miegia—Calix one-flowered; corolla two-valved; nectary one-valved, involving the germen; seeds triquetrous-rounded, included within the calix, corolla, and nectary.

Orizopsis—Calix one-flowered, two-valved; valves loose, oboval, about the length of the corolla, awnless; corolla coriaceous, subcylindric-ovate, two-valved, surrounded at the base with a line of pubescence, the exterior valve awned at the summit; perisporium two-parted, linear.

Oxybaphus—Calix five-cleft, bell-shaped; corolla funnel-shaped; nut five-cornered, one-valved, surrounded by the unfolded permanent calix.

Petitia—Calix four-toothed, inferior; corolla four-parted; drupe with a two-celled nut.

Rhoria—Calix bell-shaped, in five deep segments, unequal; corolla five-petalled, unequal; stigmas three, revolute.

Stipulicida—Calix five-parted, persistent; corolla five-petalled; petals entire, as long as the calix; style short; stigmas three; capsule one-celled, three valved; seeds few, each attached to the receptacle by an umbilical filament.

Syena—Calix three-leaved; petals three; capsule one-celled, three-valved.

Tonsella—Calix five-parted; petals five; nectary pitcher-shaped; berry one-celled, four-seeded.

Trichophorum—Spikelets nearly ovate; calix scales imbricated on all sides; corolla none; germinal setæ capillary, mostly six, in the ripening seeds, growing out very long.

Tripterella—Calix tubular and prismatic, with alated margins and a ventricose base; border six-cleft; corolla none; stigmas three; capsule three-sided, three-celled, many-seeded; stamens included within the tube.

VAGINARIA—Spike ovate; calycine scales imbricated on all sides, acutely acuminated; corolla none; stigmas three; involucel of the seed formed of three chaffy awnless scales, alternating with three slender setæ.

VALERIANA, *Valerian*—Calix none; corolla one-petalled, gibbous on one side of the base, superior; seed one.

WATSONIA—Spathe of two-valves; corolla tubular, with a cylindrical throat, its border in six deep, nearly equal segments; stigmas three, thread-shaped, deeply cloven, the segments recurved; capsule cartilaginous; seeds numerous, angular.

XIPHIDIUM—Corolla regular, of six petals; capsule superior, of three cells, with many seeds.

2. DIGYNIA *(Two Pistils.)*

CORNUCOPIÆ, *Horn-of-plenty Grass*—Involucre one-leafed, funnel-form, crenate, many-flowered; calix two-valved; corolla one-valved.

SACCHARUM, *Sugar Cane*—Calix two-valved, involucred, with a large lanugo; corolla two-valved.

PANICUM, *Panic Grass*—Calix two-valved, the outer valve very small.—Or, Calix of two very unequal leaves, containing two flowers, the outer one male, or neuter; corolla of two unequal valves, finally cartilaginous, and investing the seeds.

PHLEUM, *Cat's-tail Grass*—Calix two-valved, sessile, linear, truncated, with a two-cusped lip; corolla enclosed.

ALOPECURUS, *Fox-tail Grass*—Calix two-valved; corolla one-valved.

MILIUM, *Millet Grass*—Calix two-valved, one-flowered; valves almost equal; corolla very short; stigmas pencil-form.

AGROSTIS, *Bent Grass*—Calix bivalved, one-flowered, a little less than the corolla; stigmas longitudinally hispid.

AIRA, *Hair Grass*—Calix two-valved, two-flowered, without any rudiment of a third.

MELICA, *Melic Grass*—Calix two-valved, two-flowered, with the rudiments of one or two florets that are abortive, between the two others.

POA, *Meadow Grass*—Calix two-valved, many-flowered; spikelets ovate; valves scariose at the edge, and sharpish.

BRIZA, *Quaking Grass*—Calix bivalve, many-flowered; spikelets distich, with heart-shaped obtuse valves, the lower of which is minute.

UNIOLA, *Panicled Spike Grass*—Calix many-valved; spikelet ovate, keeled.

DACTYLIS, *Cock's-foot Grass*—Calix two-valved, compressed; one valve larger, keeled.

CYNOSURUS, *Dog's-tail Grass*—Calix two-valved, many-flowered; receptacle proper, unilateral, leafy.

FESTUCA, *Fescue Grass*—Calix of two valves; spikelet oblong, somewhat cylindrical, two-ranked, with sharp-pointed glumes.

BROMUS, *Brome Grass*—Calix two-valved; spikelet oblong, columnar, distich; awn below the top.

STIPA, *Feather Grass*—Calix two-valved, one-flowered; corolla, outer valve with a terminating awn, jointed at the base.

AVENA, *Oats*—Calix two-valved, many-flowered; awn from the back of the corolla, jointed, twisted.

LAGURUS, *Hare's-tail Grass*—Calix two-valved, with a villose awn; corolla having on the outer petal two terminating awns, and a third dorsal one, twisted back.

ARUNDO, *Reed*—Calix two-valved; florets heaped, surrounded with wool.

ARISTIDA, *Oat Grass*—Calix two-valved; corolla one-valved, with terminating awns.

LOLIUM, *Darnel*—Calix one-leafed, fixed, many-flowered; glume opposite the shaft.

ELYMUS, *Lyme Grass*—Calix lateral, aggregate, of two-valves, containing many florets.

SECALE, *Rye*—Calix two-valved, solitary, two-flowered, on a toothed elongated receptacle.

HORDEUM, *Barley*—Calix lateral, two-valved, (valves narrow, acuminate, distant, all together forming a six-leaved involucre,) one-flowered, by threes at each toothlet of the rachis.—Or, Common receptacle toothed and excavated; calix lateral, ternate, two-valved, single-flowered.

TRITICUM, *Wheat*—Calix two-valved, solitary, subtriflorous, or many-flowered, on a flexuose toothed rachis; corolla blunt, with a point.

PHALARIS, *Canary Grass*—Calix two-valved, keeled, the valves equal in length, enclosing the corolla.

PASPALUM—Calix two-valved, orbicular; corolla of the same size; stigmas pencil-shaped.

ROTTBŒLLIA.—See *Polygamia Monœcia.*

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ANTHEROPOGON—Flowers polygamous, in unilateral spikes; calix two-valved, two-flowered; hermaphrodite corolla two-valved, exterior valve three-awned, intermediate bidentate; neutral corolla of one valve, with three exserted awns; seed naked, oblong, compressed, with a longitudinal furrow.

ANTHOPOGON—Flowers polygamous, irregularly alternating upon setaceous spikes disposed in a panicle; calix two-valved, two-flowered; corolla hermaphrodite, two-valved, outer valve terminated by a long and straight awn; seed linear-oblong, internally marked with a longitudinal furrow.

ANTHOXANTHUM, *Sweet Vernal Grass*—Calix glume two-valved, one-flowered; corolla glume two-valved, acuminate; seed one.

AULAXIA—Calix two-valved, one-flowered, with the rudiment of a second; valves equal, furrowed, the furrows villose; corolla two-valved; valves nearly equal.

DIANTHUS, *Pinks.*—See *Decandria Digynia.*

LEARSIA—Calix none; glume two-valved, closed.

MUHLENBERGIA—Calix one-valved, minute, lateral; corolla two-valved.

PAPPOPHORUM—Calix two-valved, two-flowered; corolla two-valved, many-awned.

PEROTIS—Calix two equal awned valves; corolla two minute awnless valves; style deeply divided.

PHLEUM, *Cat's-tail* or *Timothy Grass*—Calix two-valved, sessile, linear, truncated, with a two-cusped lip; corolla enclosed.

PICRAMNIA.—See *Diœcia Pentandria.*

XEROCHLOA—Calix two-flowered, of two unequal valves; corolla of both flowers longer than the calix, of two valves, awl-shaped, membranaceous, awnless; stamens in the outermost flower; nectary none; seed enclosed in the inner paper-like valve of the corolla.

ZENGITES, *Yoke Grass*—Common calix of two valves, with three flowers, the female one sessile, the males stalked; corolla of the males, of two beardless valves; of the female, of one awned valve; style divided; seed oblong.

ZOYSIA—Calix of one valve, single-flowered, compressed, cartilaginous; corolla of two membranous valves within the calix; stigmas feathery; seed linear, invested with the glumes.

TRICHODIUM—Calix two-valved; valves nearly equal, acute;

corolla shorter than the calix, one-valved, awnless; stigma almost sessile, rather hirsute.

CALAMAGROSTIS, *Reed Bent Grass*—Calix two-valved, one-flowered; valves acute or acuminate; corolla two-valved, mostly shorter than the calix, surrounded with a pubescence at the base, the dorsal valve with or without an awn.

CRYPSIS, *Thorn Grass*—Calix two-valved, oblong, one-flowered; corolla two-valved, longer than the calix; stamens two or three.

POLYPOGON—Calix two-valved, one-flowered; each of the valves awned; corolla two-valved, shorter than the calix, the exterior valve terminating in an awn.

ORTHOPOGON—Calix one-flowered, with three nearly equal valves, all awned, the awn of the exterior valve much longer than the others; awns straight and smooth.

DIGITARIA, *Crab Grass*—Calix two or three valved, concave; exterior valve minute, or none, second variable, the innermost as long as the corolla; corolla two-valved, oblong-ovate, awnless; style very long; nectary cleft.

CYNODON, *Bermuda Grass*—Calix two-valved, spreading, lanceolate; corolla larger than the calix, two-valved; the exterior valve large and ovoid; nectary truncate.

TRISETUM, *Three-awned Oat Grass*—Calix two to three flowered, acuminate and carinate; corolla, outer valve terminated by two shorter almost tooth-like awns, and one longer straight dorsal awn, not contorted.

URALEPSIS—Calix scariose, two-valved, two or three flowered; flowers alternate, distinct; corolla two-valved, very unequal; seed somewhat gibbous, enlarged above, arillated.

SORGHUM, *Broom Grass*—Calix two-valved; corolla three-valved, the second one awned, the third connecting with the villose nectary; corolla of the male flower awnless; seed large. The flowers are polygamous, by pairs; the hermaphrodite sessile, the neuter pedicellate.

SESLERIA, *Moor Grass*—Calix two to five flowered; corolla two-valved, valves toothed at the point; stigma somewhat glandulous.

WINDSORIA—Calix carinate, many-flowered, two-valved; spikelets thick; styles slender, with simply pectinated stigmas; seed calciform, corrugate, impressed with a flat, central, oval pilum near its base.

DANTHONIA—Calix two-valved, many-flowered, very large, equal or exceeding the included spikelet; exterior valve of the corolla concave, with the points emarginate, mucronate, awned, or unarmed, and then trifid.

KŒLERIA—Calix irregularly two or three flowered, two-valved; corolla acuminately oblong, two-valved, shortly awned, longer than the calix; glumes nervose.

ELEUSINE—Flowers awnless, disposed on one side of the receptacle; calix carinate, many-flowered; corolla two-valved, awnless.

OXYDENIA—Common calix two-valved, subulately acuminate; corolla two-valved, minute, deciduous; valves obtuse, with or without a terminating awn; seed roundish, naked, smooth, and somewhat gibbous.

CHLORIS—Calix two-valved, two to four flowered, valves carinate, with or without an awn.

MONOCERA—Calix two-valved, rigid, fixed, many-flowered; valves unequal; flowers within the common calix three to four neuter, and one hermaphrodite.

MANISARIS—Flowers polygamous, spiked. Hermaphrodite calix one-flowered, two-valved, valves unequal; corolla two-valved, smaller, included by the calix; masculine and neutral calix uniform or regular.

TRIGYNIA *(Three Styles.)*

ERIOCAULON—Calix, common of many leaves, many-flowered; perianth superior, of two or three leaves. Male flowers central; corolla of one petal, cloven. Female flowers in the margin; corolla of two petals; stigmas two or three; capsule of two or three cells; seeds solitary.

MONTIA, *Water Chickweed*—Calix two-leaved; corolla one-petalled, irregular; capsule one-celled, two-valved.

PROSERPINACA—Calix three-parted, superior; corolla none; drupe with a three-celled nut.

HOLOSTEUM—Calix five-leaved; petals five, eroded, or biparted; capsule one-celled, subcylindric, bursting at the summit.

POLYCARPON, *All-seed*—Calix five-leaved; petals five, ovate, very small; capsule one-celled, three-valved; seeds very many.

MOLLUGO, *African Chickweed*—Calix five-leaved; corolla none; capsule three-celled, three-valved.

MINUARTIA—Calix five-leaved; corolla none; capsule one-celled, three-valved; seeds few.

DONATIA—Calix three-leaved; petals nine, twice as long as the calix, linear-oblong; anther subglobular, twin.

QUERIA—Calix five-leaved; corolla none; capsule one-celled; seed one.

LECHEA—Calix three-leaved; petals three, linear; capsule three-celled, three-valved, with as many internal ones; seeds solitary.

KŒNIGIA—Calix three-leaved; corolla none; seed one, ovate, naked.

TRIPLARIS—Calix very large, three-parted, or six-parted; corolla three-petalled, or none; nut three-sided, within the ovate base of the calix.

CLASS IV.—TETRANDRIA.

Consisting of such Plants as have Hermaphrodite Flowers, furnished with four Stamens.

1. MONOGYNIA *(One Pistil.)*

1. *Such as have aggregate Flowers, with the seeds single and naked.*

PROTEA, *Silver Tree*—Corolla four-cleft, or four-petalled; anthers linear, inserted with the petals below the tip; calix proper none; nut one-seeded, superior.

CEPHALANTHUS, *Button Wood*—Calix, common none, proper superior, funnel-form; receptacle globular, naked; seed one, lanuginous.

GLOBULARIA, *Blue Daisy*—Calix, common imbricate, proper tubular, inferior; corollets of the upper lip two-parted, lower three-parted; receptacle chaffy.

DIPSACUS, *Teazel*—Calix, common many-leaved, proper superior; receptacle chaffy.

KNANTIA—Calix, common oblong, simple, five to ten flowered; proper simple, superior; corollets irregular; receptacle naked.

SCABIOSA, *Scabious*—Calix, common many-leaved, proper double, superior; receptacle chaffy, or naked; seed coated and crowned by the partial calix.

ALLIONIA—Calix, common oblong, simple, three-flowered; proper obsolete, superior; corollules irregular; receptacle naked.

2. *Such as have their Flowers monopetalous on a double fruit, and the Style bifid.*

HEDYOTIS—Corolla monopetalous, funnel-shaped; capsules two-celled, many-seeded, inferior.

SPERMACOCE, *Button Wood*—Corolla one-petalled, funnel-shaped; capsules two, combined, two together.

SHERRARDIA, *Little Field Madder*—Corolla one-petalled, funnel-form, superior; seeds two, three-toothed.

ASPERULA, *Woodroof*—Corolla one-petalled, funnel-shaped; seeds two, globular.

DIODIA—Corolla one-petalled, funnel-form; capsule two-celled, two-seeded.

KNOXIA—Corolla one-petalled, funnel-form; seeds two, grooved; calix, one leaflet larger.

MANETTIA—Calix eight-leaved; corolla four-cleft; capsule inferior, two-valved, one-celled; seeds imbricate, orbicular, with a central seedlet.

HOUSTONIA—Corolla one-petalled, funnel-form; capsule superior, two-celled, two-seeded, (according to Gærtner, three or four seeds in each cell.)

GALIUM, *Ladies' Bed Straw*—Corolla of one petal, flat, superior; seeds two, roundish.

CRUCIANELLA, *Petty Madder*—Calix two-leaved; involucre two or three leaved, chaffy; corolla one-petalled, funnel-form, with a filiform tube and tailed border; seeds two, linear, inferior, naked, bald.

RUBIA, *Madder*—Corolla one-petalled, bell-shaped; berries two, combined, one-seeded.

EMBOTHRIUM—Petals four; stamens inserted into the border; follicle containing several winged seeds.

HYDROPHYLAX—Calix four-parted; corolla funnel-form; fruit ancipital, one-seeded.

HARTOGIA—Calix five-cleft; petals four, spreading; drupe ovate, enclosing two seeds.

ACÆNA—Calix four-leaved; corolla four-petalled; berry dry, inferior, one-seeded, with spines bent backwards.

BANKSIA—Calix four-cleft, inferior; corolla four-parted; tube very short; border very long, linear-lanceolate; anthers sessile, in the cavity of the parts of the corolla; capsule two-seeded, one or two celled, two-valved.

ORIXA—Petals four, lanceolate, flat; calix four-cleft; stigma capitate; capsule uncertain.

OTHERA—Calix four-parted; petals four, ovate, flat; stigma sessile.

SKIMMIA—Calix four-parted; petals four, concave; berry four-seeded.

3. *Such as have monopetalous Flowers, otherwise circumstanced.*

SIPHONANTHUS—Corolla one-petalled, funnel-form, very long, inferior; berries four, one-seeded.

CATESBÆA, *Lily Thorn*—Corolla monopetalous, funnel-form, extremely long, superior; stamens within the mouth; berry polyspermous.

IXORA, *American Jesmine*—Corolla one-petalled, funnel-form, long, superior; stamens above the mouth; berry four-seeded.

PAVETTA—Corolla one-petalled, funnel-form, superior; stigma curved; berry two-seeded, one often abortive.

PETESIA—Corolla one-petalled, funnel-form; stigma bifid; berry many-seeded.

MITCHELLA—Corolla one-petalled, superior, two on the same germen; stigmas four; berry bifid, four-seeded.

CALLICARPA—Calix four-cleft; corolla four-cleft; berry four-seeded.

JOHNSONIA—Perianth, or corolla, in six deep equal segments, withering, deciduous; filaments dilated and united at their base; style thread-shaped; stigma obtuse; capsule superior, of three-cells and three valves; seeds two in each cell.

AQUARTIA—Calix bell-shaped; corolla wheel-shaped, with linear divisions; berry many-seeded.

POLYPREMUM, *Carolina Flax*—Calix four-leaved; corolla four-cleft, wheel-shaped, with obcordate lobes; capsule compressed, emarginate, two-celled.

PENEA—Calix two-leaved; corolla bell-shaped; style quadrangular; capsule four-cornered, four-celled, eight-seeded.

BLÆRIA—Calix four-parted; corolla four-cleft; stamens inserted into the receptacle; capsule four-celled, many-seeded.

BUDDLEA—Calix four-cleft; corolla four-cleft; stamens from the divisions; capsule two-furrowed, two-celled, many-seeded.

EXACUM—Calix in four segments; corolla salver-shaped, with an inflated tube; capsule superior, with two furrows, two cells, and many seeds, bursting at the top; stigma capitate.

PLANTAGO, *Plantain*—Calix four-cleft; corolla four-cleft, with the border reflex; stamens very long; capsule two-celled, cut transversely.

SCOPARIA—Calix four-parted; corolla four-parted, wheel-shaped; capsule one-celled, two-valved, many-seeded.

CENTUNCULUS, *Base Pimpernel*—Calix four-cleft; corolla four-cleft, spreading; stamens short; capsule one-celled, opening horizontally.

SANGUISORBA, *Burnet*—Calix two-leaved, inferior; corolla superior; germen between the calix and corolla.

CISSUS—Berry one-seeded, surrounded by the calix and four-parted corolla.

ÆGIPHILA—Calix four-toothed; corolla quadrifid; style semi-bifid; berry four-seeded.

4. *Such as are tetrapetalous and complete, not wanting Calix or Corolla.*

EPIMEDIUM, *Barrenwort*—Petals four; nectaries four; pouches lying on the petals; calix opposite to the petals, caducous; pod superior, of one cell, with many seeds.

CORNUS, *Dog Wood* or *Cornelian Cherry*—Involucre generally four-leaved; petals four, superior; drupe with a two-celled nut.

FAGARA—Calix four-cleft; petals four; capsule superior, of two valves and one cell; seeds solitary.

TOMEX, *Tallow Tree*—Involucre four or five leaved; calix none; corolla five-petalled; nectary scales five between the lower stamens; berry one-seeded.

AMMONIA—Corolla four-petalled, inserted into the calix; calix one-leafed, plaited, eight-toothed, inferior; capsule four-celled.

PTELEA, *Shrub Trefoil*—Calix four-parted, inferior; corolla four-petalled; stigmas two; fruit with a roundish membrane, having one seed in the middle.

LUDWIGIA—Calix four-parted, superior; corolla four-petalled; capsule inferior, four-cornered, four-celled; receptacle distinct from the axis of the fruit, bearing the seeds on each side.

OLDENLANDIA, *East Indian Madder*—Calix fastened to the pericarp, with four free awl-shaped teeth at top; corolla one-petalled, four-cleft; capsule inferior, two-celled; receptacles free, fastened to the partition by the base only.

ISNARDIA—Calix four-cleft; corolla none; capsule four-celled, covered by the calix.

SANTALUM, *Sandal Wood*—Calix four-toothed; corolla four-petalled, with the petals growing on the calix, besides four glands; berry inferior, one-seeded.

TRAPA, *Water Caltrops*—Calix four-parted; corolla four-

petalled; nut armed with four opposite spines, which were the leaves of the calix.

Samara—Calix four-parted; petals four; stamens immersed in the base of the petals; stigma funnel-shaped; drupe one-seeded.

5. Such as are complete, Calix or Corolla wanting.

Dorstenia, *Contrayerva*—Receptacle common one-leafed, fleshy, in which solitary seeds nestle.

Elæagnus, *Oleaster*, or *Wild Olive*—Corolla none; calix four-cleft, bell-shaped, coloured; drupe inferior.

Krameria—Calix none; corolla four-petalled; nectary, upper three-parted, lower two-leaved; berry dry, echinated, one-seeded.

Rivina—Calix four-leaved, coloured, permanent; corolla none; berry containing one lens-shaped seed.

Salvadora—Calix four-cleft; corolla four-cleft; berry one-seeded; seed covered with an aril.

Camphorosma—Calix pitcher-form, two of the teeth opposite, and the alternate ones very small; corolla none; capsule one-seeded.

Alchemilla, *Ladies' Mantle*—Calix eight-cleft; corolla none; seed one.

Struthiola—Corolla none; calix tubular, with eight glands at the mouth; berry juiceless, one-seeded.

Cometes—Involucre four-leaved, three-flowered; calix four-leaved; capsule tricoccous.

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Blackburnia—Calix four-toothed; petals four, elliptic; anthers heart-shaped; germen conic; stigma simple; pericarp, berry with a simple seed.

Chloranthus—Calix none; corolla a petal three-lobed by the side of the germen; anthers growing to the petal; drupe one-seeded.

Coccocypselum—Calix four-parted, superior; corolla funnel-form; berry inflated, two-celled, many-seeded.

Cunninghamia—Calix very small, four-toothed; corolla four-cleft, with a short tube; berry crowned with a two-celled, two-seeded nut.

Curtisia, *Hassagay Tree*—Calix four-parted; petals four; drupe superior, roundish, succulent, with a four or five celled nut.

Ernodea—Corolla of one petal, salver-shaped; calix in four deep segments; style simple; berry inferior, two-celled; seeds solitary.

Fedia—Calix superior, with three or four teeth; corolla of one petal, five-cleft; capsule crowned, without valves, with one fertile cell; seeds solitary.

Froelichia—Calix superior, with four teeth; corolla tubular; berry dry, with one seed, invested with an aril.

Glossoma—Calix turbinate, four-toothed, superior; corolla four-petalled; anthers almost united, with a membranaceous scale at the end; stigmas four.

Gonatocarpus—Corolla four-cleft; drupe eight-cornered, one-seeded.

Hoffmannia—Calix four-toothed; corolla salver-shaped, four-parted; filaments none; berry two-celled, many-seeded.

Labatia—Calix four-leaved, inferior; corolla subcampanulate, four-cleft, with two minute segments in the divisions of the corolla; capsule four-celled; seeds solitary.

Lambertia—Petals four, cohering, spirally revolute, bearing the stamens; nectary of four scales; stigma awl-shaped; folliele woody; seeds two, bordered; involuere of many leaves, imbricated, coloured, deciduous; receptacle flat.

Lasiostoma—Calix very short, five-petalled, with two acute scales; corolla funnel-form, four-cleft; capsule orbiculate, one-celled, two-seeded.

Mattuschkæa—Calix four-parted, with linear leaflets; corolla one-petalled, with a long tube and four-cleft border; germen superior, four-cleft; seeds four, naked.

Monetia—Calix four-cleft; petals four; berry two-celled; seeds solitary.

Myrmecia—Calix tubular, five-toothed; corolla one-petalled, with an inflated mouth and five-cleft border; germen with five glands at the base; stigma bilamellate; capsule two-celled, two-valved, many-seeded.

Nerteria—Corolla funnel-form, four-cleft, superior; berry two-celled; seeds solitary.

Opercularia—Flowers compound; calix, common one-leafed, unequally toothed, closed by a common receptacle, flowering above, seeding below, falling when ripe.

Persoonia—Calix none; petals four, staminiferous towards the base; glands four, at the base of the germen; stigma blunt; drupe one-seeded.

Picrium—Calix four or five cleft; corolla one-petalled, four or five cleft; nectary of four or five scales; stigma bilamellate; capsule half two-celled, two-valved.

Pothos—Spathe, spadix simple, covered; perianth none; petals four; berries two-seeded.

Pyrostria—Calix four-toothed; corolla bell-shaped, four-cleft, downy in the throat; berry inferior, obovate, with eight furrows and eight seeds.

Rotala—Calix three-toothed; corolla none; capsule three-celled, many-seeded.

Roussea—Calix four-cleft; corolla one-petalled, bell-shaped, four-cleft, inferior; berry quadrangular, many-seeded.

Rupala—Calix none; petals four, cohering at the base; stamens inserted into the middle of the petals; pericarp one-celled, one-seeded.

Scolosanthus—Calix four-cleft; corolla tubular, with a revolute border; drupe one-seeded.

Siderodendrum—Corolla one-petalled, salver-shaped; calix four-toothed; berry two-lobed, two-celled; seeds solitary.

Valantia, *Crosswort*.—See *Polygamia Monœcia*.

Wallenia—Calix four-cleft, inferior; corolla tubular, four-cleft; berry with one seed.

Witheringia—Corolla deeply four-cleft, reflexed, its tube with four external prominences, internally concave; calix obscurely four-toothed; anthers converging, bursting laterally; berry with two cells and many seeds.

Xylomelum, *Wooden Pear*—Petals four, bearing the petals above the middle, regular, revolute; nectariferous glands four; stigma club-shaped; style deciduous; follicle woody, of one excentric cell, with two winged seeds.

Zieria—Calix in four deep segments; petals four; stamens smooth, each inserted into a gland; style simple; stigma four-lobed; capsules four, combined; seeds with an elastic tube.

2. DIGYNIA *(Two Pistils.)*

Aphanes, *Parsley Piert*—Calix eight-cleft; corolla none; seed two, or one, naked.

Cruzita—Inner calix four-leaved, outer three-leaved; corolla none; seed one.

Buffonia, *Bastard Chickweed*—Calix four-leaved; corolla four-petalled; capsule one-celled, two-seeded.

Hamamelis, *Witch-hazel*—Calix four-cleft, with three bractes; petals four, long and linear, with a short dilated filament at the base; filaments and anthers united; an-

thers two-celled, each having a vertical valve; capsule, or nut, coriaceous, two-celled; seeds two, arilled.

Cuscuta, *Dodder*—Calix four-cleft; corolla one-petalled; capsule two-celled.

Hypecoum—Calix two-leaved; petals four, the two outer broader and trifid; fruit a silique.

Galopina—Calix none; corolla four-cleft, superior, revolute; seeds two, prickly.

3. TETRAGYNIA *(Four Pistils.)*

Ilex, *Holly*—Calix four-toothed; corolla wheel-shaped; style none; berry four-seeded.

Coldenia—Calix four-leaved; corolla funnel-form; styles four; seeds two-celled.

Potamogeton, *Pond Weed*—Calix none; petals four; style none, or very short; seeds four: (drupes four, Gærtner.)

Ruppia, *Tassel Pondweed*—Calix none; corolla none; seeds four, pedicelled.

Sagina, *Pearlwort*—Calix four-leaved; petals four; capsules one-celled, four-valved, many-seeded.

Myginda—Calix four-parted; petals four; drupe globular.

Tillæa—Calix three or four parted; petals three or four, equal; capsules three or four, many-seeded.

CLASS V.—PENTANDRIA

Consisting of such Plants as bear Hermaphrodite Flowers, furnished with five Stamens.

1. MONOGYNIA *(One Pistil.)*

1. *Monopetalous tetraspermous, or four-seeded.*

Heliotropium, *Turnsole*—Corolla salver-shaped, five-cleft, with teeth interposed; throat closed with arches.

Myosotis, *Scorpion Grass*—Corolla salver-shaped, five-cleft, emarginate; the opening closed with arches.

Lithospermum, *Gromwell*—Calix five-parted; corolla funnel-form, perforated at the throat.

Anchusa, *Bugloss*—Corolla funnel-shaped, the throat closed with an arch of scales; seeds engraved at the base.

Cynoglossum, *Hound's-tongue*—Corolla funnel-form, the throat closed with arches; seeds flat, affixed to the style by the inside only.

Pulmonaria, *Lungwort*—Calix prismatic, five-cornered; corolla funnel-form, with an open throat.

Symphytum, *Comfrey*—Corolla border tubular, ventricose; throat closed by lanceolate rays; calix five-parted; seeds four, naked.

Onosma—Corolla bell-shaped, with the throat pervious; seeds four.

Cerinthe, *Honeywort*—Border of the corolla tube bellied, throat pervious; seeds two, bilocular.

Borago, *Borage*—Corolla rotated; throat closed with rays.

Asperugo—Calix of the fruit compressed; lamellas flat-parallel, sinuated.

Lycopsis, *Wild Bugloss*—Corolla with the tube bent in.

Echium, *Viper's Bugloss*—Seeds four, naked; corolla of one petal, irregular, pervious, and naked; stigma deeply cloven.

Nolana—Corolla bell-shaped; style among the germens; seeds five, berried, two-celled. (Drupes five, three or five celled, with one sced in each cell, Gærtner.)

Tournefortia—Corolla funnel-shaped; throat naked; stamens in the tube; stigma umbonate; berry two-seeded, superior, perforated at top by pores.

Messerschmidia—Corolla funnel-form, with a naked throat; berry suberous, bipartile, each two-seeded.

2. *Monopetalous, with the Capsule within the Flower.*

Diapensia—Corolla salver-shaped; calix five-leaved, imbricate with three other leaflets; stamens placed on the tube of the corolla; capsule three-celled.

Aretia—Corolla salver-shaped, five-cleft; tube ovate; stigma flat-headed; capsule one-celled, globular, with about five seeds.

Androsace—An involucre to the umbel; tube of the corolla ovate, with a glandulous mouth; capsule one-celled, globose.

Primula, *Primrose, Cowslip,* and *Auricula*—Capsule of one cell, with ten teeth; corolla, tube cylindrical, with a spreading mouth; stigma globose.

Cortusa, *Bear's-ear Sanicle*—Corolla wheel-shaped, the throat having an elevated ring; capsule one-celled, oval, five-valved at the end.

Porana—Calix five-cleft, when in fruit larger; corolla bell-shaped; style semi-bifid, longer, permanent; stigmas globular; pericarp two-valved.

Soldanella—Corolla bell-shaped, lacerotifid; capsule one-celled, many-toothed at the top.

Dodecatheon, *Virginian Cowslip*—Corolla rotate, reflex; stamens placed on the tube; capsule one-celled, oblong.

Cyclamen, *Sowbread*—Corolla rotate, reflex, with a very short tube and prominent throat; berry covered with a capsule.

Menyanthes, *Buckbean*—Corolla shaggy; stigma bifid; capsule one-celled.

Hottonia, *Water Violet*—Corolla salver-shaped; stamens placed on the tube of the corolla; capsule one-celled.

Hydrophyllum, *Water Leaf*—Corolla bell-shaped, having five longitudinal melliferous streaks on the inside; stigma bifid; capsule globular, two-valved.

Lysimachia, *Loosestrife*—Corolla whell-shaped; capsule globular, mucronate, ten-valved (according to Gærtner, five-leaved;) with receptacles free; and seeds with a central navel opposite to the embryo.

Anagallis, *Pimpernel*—Corolla rotate; capsule opening horizontally.

Theophrasta—Corolla bell-shaped, with long, erect, spreading segments; fruit one-celled, very large, roundish, many-seeded.

Spigelia, *Worm Grass*—Corolla funnel-shaped; capsule twin, two-celled, many-seeded.

Ophiorrhiza, *Serpent's-tongue*—Corolla funnel-form; germen bifid; stigmas two; fruit two-lobed.

Azalea, *American Upright Honeysuckle*—Corolla bell-shaped; stamens inserted into the receptacle; capsule five-celled.

Plumbago, *Leadwort*—Corolla funnel-form; stamens inserted into the scales, enclosing the base of the corolla; stigma five-cleft; seed one, oblong, truncated.

Phlox, *Lychnidea*—Corolla salver-shaped; filaments unequal; stigma trifid; calix prismatical; capsule three-celled, one-seeded.

Convolvulus, *Bindweed*—Corolla bell-shaped, plaited; stigmas two; capsule two-celled, with two seeds in each cell.

Ipomœa, *Quamoclit*—Corolla funnel-form; stigma headed, globose; capsule three-celled.

Lisianthus—Calix keeled; corolla with a ventricose tube

and recurved divisions; stigma two-plaited; capsule two-celled, two-valved, the margins of the valves intorted.

Brossæa—Calix fleshy; corolla truncate; capsule five-celled, many-seeded.

Allamanda—Corolla contorted; capsule lens-shaped, erect, echinate, one-celled, two-valved, many-seeded.

Polemonium, *Greek Valerian*—Corolla five-parted, the bottom closed by valves bearing the stamens; stigma trifid; capsule three-celled, superior.

Retzia—Corolla cylindrical, villose on the outside; stigma bifid; capsule two-celled.

Epacris—Calix imbricated; corolla tubular; stamens inserted into its orifice; scales five, at the base of the germen; capsule superior, of five cells and five valves, with partitions from their middle; seeds numerous, chaffy.

Doræna—Corolla five-cleft; stigma emarginate; capsule one-celled.

Weigelia—Corolla funnel-shaped; style from the base of the germen; stigma peltate; calix superior, of five leaves.

Tectona, *Teak Tree*—Corolla five-cleft; stigmas toothed; drupe dry, spongy, within the inflated calix; nut four-celled.

Ignatia, *Bitter Bean*—Calix five-toothed; corolla funnel-form, very long; fruit one-celled, many-seeded.

3. *Monopetalous, with the Germen below the Flower.*

Campanula, *Bell-flower*—Corolla bell-form, the bottom closed with staminiferous valves; capsule inferior, gaping, with lateral pores.

Phyteuma, *Rampions*—Corolla wheel-shaped, with linear segments, five-parted; stigma bifid, or trifid; capsule roundish, two-celled, or three-celled, inferior.

Trachelium, *Throatwort*—Corolla funnel-form; stigma globular; capsule three-celled, inferior.

Samolus, *Brookweed* or *Water Pimpernel*—Corolla salver-shaped, five-cleft, with five intermediate scalelets; stamens fenced by the scalelets of the corolla; capsule one-celled, inferior.

Nauclea—Corolla funnel-form; capsule inferior, of two disjointed cells, with many seeds; receptacle common, globular.

Rondeletia—Corolla funnel-shaped, nectariferous at the mouth; capsule two-celled, inferior, many-seeded, roundish, crowned with the calix.

Macrocnemum—Corolla bell-shaped; capsule two-celled, two-valved, with the valves gaping outwardly at the sides; seeds imbricate.

Bellonia—Corolla wheel-shaped; capsule one-celled, inferior, many-seeded, beaked with the calix.

Portlandia—Corolla club-funnel-shaped; anthers longitudinal; capsule five-cornered, obtuse, two-celled, two-valved, many-seeded, crowned with the permanent calix.

Cinchona, *Jesuits' Bark*—Capsule inferior, two-celled, bipartile; the valves parallel to the partitions, opening inwardly.

Psychotria, *Ipecacuanha*—Calix five-toothed, crowning; corolla tubular; berry globular; seeds two, hemispherical, grooved.

Coffea, *Coffee*—Corolla salver-shaped; stigma upon the tube; berry inferior, two-celled; seeds arilled.

Chiococca, *Snow-berry Tree*—Corolla funnel-form, equal; berry one-celled, two-seeded, inferior.

Ceropegia—Contorted follicles two, erect; seeds plumose; border of the corolla converging.

Lonicera, *Honeysuckle*—Corolla one-petalled, irregular; berry many-seeded, two-celled, inferior.

Triosteum—Calix five-parted, the length of the corolla; corolla one-petalled, almost equal; berry three-celled, inferior; seeds solitary.

Morinda—Flowers aggregate, one-petalled; stigma bifid; drupes aggregate.

Conocarpus, *Button Tree*—Petals five, or none; calix bell-form; seeds naked, solitary, inferior; flowers aggregate.

Hamellia—Corolla five-cleft; berry five-celled, inferior, many-seeded.

Erithalis—Corolla in five deep recurved segments; calix cup-shaped; berry inferior, of ten cells; seeds solitary.

Menais—Calix three-leaved; corolla salver-shaped; berry four-celled; seeds solitary.

Matthiola—Calix entire; corolla tubular, superior; undivided; drupe with a globular nucleus.

Scævola—Corolla one-petalled, with the tube cloven longitudinally, or the border five-cleft and lateral; drupe inferior, containing one two-celled nut.

Mussænda—Corolla funnel-form; stigmas two, thickish; berry oblong, inferior; seeds disposed in four rows.

Virecta—Calix five-leaved, with teeth interposed; corolla funnel-form; stigma two-parted; capsule two-celled, two-valved, many-seeded, inferior.

Escallonia—Berry of one cell, with many seeds; calix encompassing the fruit; stigma capitate; petals five, inserted into the calix.

Caroxylon—Corolla five-petalled; nectary five-leaved, converging, inserted into the corolla; seeds clothed.

Elæodendrum—Calix in five deep segments; petals five; drupe superior, ovate; nut two-celled.

Hovenia—Petals five, convoluted; stigma trifid; capsule three-celled, three-valved.

4. *Such as have declining Stamens.*

Mirabilis, *Marvel of Peru*—Calix inferior; corolla funnel-form, superior; nectary globular, including the germen.

Coris, *Heath Low Pine*—Calix superior; corolla one-petalled, irregular; capsule five-valved, superior.

Verbascum, *Mullein*—Corolla wheel-shaped, a little unequal; stamens distant, declined, bearded; capsule two-celled, two-valved, many-seeded; stigma simple.

Datura, *Thorn Apple*—Corolla funnel-form, plaited; calix tubular, regular, deciduous; capsule four-valved.

Hyoscyamus, *Henbane*—Corolla funnel-form, obtuse; stamens inclined; capsule two-celled, covered with a lid.

Nicotiana, *Tobacco*—Corolla funnel-form, with a plaited border; stamens inclined; capsule two-valved, two-celled.

Atropa, *Mandrake*, and *Deadly Nightshade*—Corolla bell-shaped; stamens distant; berry globular, two-celled.

5. *Monopetalous, with a Berry above the Receptacle.*

Physalis, *Winter Cherry*—Corolla wheel-shaped; stamens converging; berry within an inflated calix, two-celled.

Solanum, *Nightshade* and *Potatoes*—Corolla wheel-shaped; anthers subcoalescent, opening at the top by a double pore; berry two-celled.

Capsicum, *Guinea Pepper*—Corolla rotated; berry exsuccous.

Strychnos, *Poison Nut*—Corolla five-parted; berry one-celled, with a woody rind.

Jacquinia—Corolla ten-cleft; stamens inserted into the receptacle; berry one-seeded.

Chironia—Corolla rotated; petals declinate; stamens on the tube of the corolla; anthers finally spiral; pericarp two-celled. The drooping stigma seems to constitute the essence of this genus.

Cordia, *Sebestan Plum*—Corolla funnel-form; style dichotomous; drupe with two-celled nuts.

Cestrum—Corolla funnel-form; stamens emitting a toothlet from their middle; berry unilocular.

Ehretia—Corolla one-petalled, inferior; berry four or eight celled; seeds solitary; stigma cloven.

Varronia—Calix tubular; corolla five-cleft; drupe with a four-celled nut.

Laugieria—Corolla five-cleft; drupe with a five-celled nut.

Lycium, *Boxthorn*—Corolla tubular, closed at the throat by the beard of the filaments; berry two-celled, many-seeded.

Chrysophyllum, *Star Apple*—Corolla bell-shaped, ten-cleft; segments alternate, spreading; berry ten-seeded.

Sideroxylum, *Ironwood*—Corolla five-cleft; nectary in most five-leaved; stigma simple; berry five-seeded.

Rhamnus, *Buckthorn*, *Alaternus*, *Lotus*, and *Jujube*—Calix tubular; corolla scales defending the stamens, inserted into the calix; berry superior.

Arduina, *Cape Buckthorn*—Corolla one-petalled; stigma bifid; berry one-celled; seed solitary.

Ellisia—Corolla funnel-shaped, much narrower than the calix; capsule coriaceous, superior, of ten cells and two valves; seed two in each cell, dotted, one above the other.

Phylica—Perianth five-parted, turbinate; petals none, but five scales defending the stamens; capsule tricoccous, inferior.

Bladhia—Corolla wheel-shaped, deciduous; berry containing one arilled seed.

Fagræa—Calix five-cleft; corolla funnel-shaped; border oblique; berry coated, of two cells; seeds globose; stigma peltate.

6. *Polypetalous.*

Ceonathus, *New Jersey Tea*—Petals five, saccular, vaulted; berry dry, three-celled, three-seeded.

Buttneria—Corolla five-petalled; filaments at the top, connate with the petals; capsule five-grained, muricate.

Myrsine—Corolla half-five-cleft, converging; germen filling the corolla; berry one-seeded, with a five-celled nucleus.

Celastrus, *Staff Tree*—Corolla five-petalled, spreading; capsule triangular, trilocular; seeds calyptrated.

Euonymus, *Spindle Tree*—Calix flat; petals five; capsule superior, five-sided, coloured, of five cells and five valves; seeds in a pulpy covering.

Diosma—Corolla five-petalled; nectaries five, on the germen; capsules three or five, conjoined; seeds veiled.

Brunia—Flowers aggregate; filaments inserted into the claws of the petals; stigma bifid; seeds solitary, two-celled.

Itea—Capsule two-celled, two-valved, many-seeded; stigma emarginate.

Galax—Calix in five deep segments; petals five; nectary tubular, in ten segments, alternately bearing the anthers; capsule superior, of three cells and three valves; seeds many.

Cedrela, *Barbadoes Bastard Cedar*—Calix withering; corolla five-petalled, funnel-form, fastened by the base to the receptacle to the third of its length; capsule woody, five-celled, five-valved; seeds imbricate downwards, with a membranaceous wing.

Mangifera, *Mango Tree*—Corolla five-petalled; drupe kidney-form.

Hirtella—Petals five; filaments very long, permanent, spiral; style lateral; berry one-seeded.

Ribes, *Currant* and *Gooseberry Trees*—Calix superior, tubular, five-cleft; petals five, inserted, with the stamens, into the calix; style bifid; berry many-seeded, inferior.

Gronovia—Petals five, together with the stamens inserted into the bell-shaped corolla; berry dry, five-cornered, inferior, containing one seed.

Hedera, *Ivy*—Petals five, oblong; berry five-seeded, surrounded by the calix.

Vitis, *Vine*—Petals cohering at the top, shrivelling; berry five-seeded, superior.

Lagœcia, *Wild Cumin*—Involucre, both universal and partial, pinnatifid; perianth of five leaves, in many capillary segments; petals bifid; seed solitary, inferior.

Sauvagesia—Calix five-leaved; corolla five-petalled; nectary five-leaved, encompassed by hairs, alternate with the petals; capsule one-celled.

Claytonia—Calix two-valved; stigma trifid; capsule three-valved, one-celled, three-seeded.

Achyranthes—Calix five-leaved; corolla none; stigma bifid; seed solitary.

Roridula—Calix five-leaved; corolla five-petalled; anthers scrotiform at the base; capsule three-valved, three-celled.

Plectronia—Petals five, inserted into the throat of the calix; berry two-seeded, inferior.

Cyrilla.—See *Didynamia Angiosperma.*

Heliconia, *Bastard* or *Wild Plantain*—Spathes both general and partial; perianth none; corolla three-petalled; nectary two-leaved; pericarp tricoccous; seeds solitary; capsules fleshy, three-celled.

Carissa—Corolla contorted; berries two-celled, many-seeded.

Celosia, *Cock's Comb*—Calix three-leaved; leaflets similar to those of the five-petalled corolla; stamens conjoined at the base to the plaited nectary; capsule gaping horizontally.

Calodendrum—Calix spreading, five-petalled; nectary five-leaved; capsule five-celled.

Chenolea—Calix globular, one-leafed, five-parted; capsule one-celled, containing one smooth seed, bifid at the tip.

Corynocarpus—Nectaries five, petal-shaped, alternate with the petals, glandulous at the base.

7. *Incomplete Flowers, or having no Petals.*

Illecebrum, *Knot Grass*—Calix five-leaved, cartilaginous; corolla none; stigma simple; capsule five-valved, one-seeded.

Glaux, *Sea Milkwort*—Calix one-leafed, bell-shaped; capsule one-celled, five-valved, five-seeded.

Thesium, *Bastard Toad-flax*—Calix one-leafed, into which the stamens are inserted; corolla none; nut inferior, one-seeded.

8. *Such as have the lobes of the Corollas bent obliquely to the right.*

Rauwolfia—Corolla oblique, salver-shaped; berry globose, suculent, two-seeded.

Cerbera—Contorted: drupe one-seeded.

Vinca, *Periwinkle*—Corolla one-petalled, contorted; follicles two, erect; seeds naked.

Gardenia, *Cape Jasmine*—Corolla of one-petal, contorted; berry coated, inferior, with many seeds; stigma lobed; anthers sessile in the mouth of the tube; segments of the calix vertical.

Nerium, *Rose-bay*, or *Oleander*—Corolla salver-shaped, contorted; with a tube terminated by a lacerated crown; follicles two, erect.

Plumeria—Corolla contorted; follieles two, reflex; seeds inserted into their proper membrane.

Echites, *Savanna Flower*—Corolla contorted, funnel-shaped,

with the throat naked; follicles two, long, straight; seeds downy.

CAMERARIA—Contorted: follicles two, horizontal; seeds inserted into their proper membrane.

TABERNÆMONTANA—Contorted: anthers arrow-shaped; follicles two, horizontal; seeds immerged in pulp.

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ÆGICERAS—Calix bell-shaped, half-five-cleft; capsule bow-shaped, one-celled, gaping on the convex side; seed inverted.

ARDISIA—Calix five-cleft; corolla one-petalled, five-parted, reflex; stigma simple; berry roundish, one-seeded.

ARGOPHYLLUM—Capsule three-celled; nectary pyramidal, five-angled, the length of the corolla.

AZALEA, *Swamp Honeysuckle*—Corolla bell-shaped; stamens inserted into the receptacle; capsule five-celled.

BACOPA—Corolla with a short tube, spreading at top; stamens inserted into the tube of the corolla; stigma headed; capsule one-celled.

BÆOBOTRYS—Corolla tubular, with a five-cleft border; calix double, outer two-leaved, inner one-leafed, bell-shaped; berry globose, one-celled, growing to the calix, many-seeded.

BASSOVIA—Corolla five-cleft, spreading, with a very short tube; berry ovate, knobbed, with many seeds.

BATSCHIA—Calix five-parted; corolla salver-form, rather large, tube straight, much longer than the calix, closed at the base by a bearded ring; seed indurated, shining.

BERTIERIA—Calix turbinate, five-toothed; corolla tube short, with a villose mouth; berry globose, inferior, many-seeded.

CAMAX—Calix wheel-shaped; filaments inserted between the segments of the corolla; berry four-celled, many-seeded, all villose.

CAPRIFOLIUM, *Coral Honeysuckle*—Calix five-toothed, bracteate at the base; corolla long and tubulous, five-cleft; berry three-celled, many-seeded.

CARPODETUS—Calix five-toothed, fastened to the germen; corolla five-petalled; stigma flat-headed; berry globular, five-celled.

CHIMARRHIS—Corolla funnel-form, with a very short tube; capsule inferior, obtuse, two-celled, two-valved, the valves bifid at the tip; seed one in each cell.

COLLOMIA—Calix in the shape of a wine-glass, rather large, border five-cleft, acute; corolla funnel-form, five-lobed, tube straight, long and slender; capsule three-cornered, three-celled, three-valved, three-seeded; seed oblong, angular, enveloped by a tenacious mucilaginous integument.

CRANZIA—Calix five-parted; petals five; nectary one; berry a berried capsule.

CRYPTOSTOMUM—Calix ventricose, five-cleft; tube of the corolla inserted into the throat of the calix; border five-cleft; neetary five-toothed, closing the mouth of the corolla; berry dry, three-celled, with one seed in each cell.

DENTELLA—Corolla tubular, five-cleft, with three-toothed segments; calix five-parted; stigmas two; capsule globular, inferior, two-celled, many-seeded.

EMBELIA—Perianth small, five-cleft, inferior; filaments five, equal; style one; pericarp a berry.

ERYSIBE—Corolla salver-shaped; border in ten equal segments; style none; stigma five-cleft; berry superior, with one seed.

EUOSMA—Calix deeply five-cleft; corolla bell-shaped, with a five-cleft border; stigmas four-lobed; capsule superior, with two furrows and two cells, bursting at the top; seeds several, oval, affixed to a triangular receptacle.

EUPAREA—Calix of five-leaves; petals from five to twelve; berry superior, dry, of one cell, with many seeds; receptacle globose.

GENIOSTOMA—Corolla funnel-shaped, bearded at the mouth; calix inferior, with five segments; stigma cylindrical, abrupt, furrowed; pericarp of two cells, with many seeds.

GLUTA—Calix bell-shaped, deciduous; petals five, glued at bottom to the column of the germen; filaments inserted into the tip of the column; germen sitting on an oblong column.

GOODENIA—Corolla longitudinally cloven on the upper side, exposing the organs of fructification; border five-cleft, leaning one way; anthers linear; stigma cup-shaped, ciliated; capsule two-celled, two-valved, with a parallel partition; seeds many, imbricated.

GYNOPOGON—Calix half-five-cleft, inferior, permanent; corolla five-parted, tube ventricose below the tip; throat contracted; stigma globular, two-lobed; berry pedicelled, subglobular; seed cartilaginous, subbilocular.

HAMILTONIA, *Oil Nut*—Calix turbinate-campanulate, five-cleft; corolla none; germen immersed in a five-toothed glandulous disk; style one; stigmas two or three, sublentiform; drupe pyriform, one-seeded, enclosed in the adhering base of the calix. Dioicous: the male flower nearly similar to the hermaphrodite.

HEDYCREA—Calix one-leafed, hemispherical, five-toothed; corolla none; drupe oval, one-celled; nut ovate, covered with fibres, one-celled, the shell hard.

IPOMERIA—Calix subcampanulate, membranaceous at the base, border five-cleft; corolla funnel-form, five-lobed, segments entire; stamens unequal, emerging from the tube of the corolla; stigma trifid; capsule superior, three-sided, three-celled, three-valved, many-seeded; seeds in two rows, angular, naked.

LECHENAULTIA—Calix superior; tube of the corolla slit longitudinally on one side; anthers cohering; pollen of compound grains; stigma obsolete, in the bottom of a two-lipped cover; capsule prismatic, of two cells and four opposite valves, with central partitions; seeds cubical or cylindrical, shelly.

LECA—Corolla one-petalled; nectary on the tube of the corolla, upright, five-cleft; berry five-seeded.

LEVISANUS—Flowers aggregate; calix one-leafed, superior, five-cleft; corolla five-petalled, superior; filaments inserted into the base of the perianth; styles two, conjoined; berry two-celled; seeds five or six, compressed.

LITA—Calix five-cleft, with two or three scales at the base; corolla salver-shaped, with a very long tube, dilated at the base and throat; border five-cleft; anthers twin, inserted in the throat; corolla one-celled, two-valved; seeds numerous.

MAHERNIA—Calix five-toothed; petals five; nectaries five, obcordate, placed under the filaments; capsule five-celled.

NICANDRA—Calix five-parted, with five angles, angles compressed, segments sagittate; corolla campanulate; stamens incurved; berry three to five celled, covered by the calix.

ONOSMODIUM—Calix deeply five-parted; corolla somewhat tubular-campanulate; orifice naked, border ventricose, half-five-cleft, segments connivent, acute; anthers sessile, included; style much exserted, entire, acute.

PÆDERIA—Contorted: berry inflated, brittle, two-seeded; style bifid.

Paronychia—Calix five-parted; segments acuminate from below the internal apex, and coloured in the inside; corolla none; five filaments alternate with the stamens; style bifid; stigmas capitate.

Phacelia—Calix five-parted; corolla subcampanulate, five-cleft, with five longitudinal margined melliferous grooves on the inside; stamens exserted; style filiform; stigmas two; capsule two-celled, two-valved, four-seeded.

Pilocarpus—Calix five-leaved; corolla five-petalled; filaments inserted below the germen; pericarp with from two to five cocculi or grains, united below, elastic.

Pinckneya—Calix five-parted, one or two of the segments very large, resembling coloured bractes; corolla long and tubulous, the border recurved; stamens exserted, inserted near the base of the tube; capsule roundish, at length opening with two valves in a contrary direction to the double dissepiment; seeds winged, transversely arranged upon the receptacle.

Pittosporum, *Pitch Seed*—Calix deciduous; petals five, converging into a tube; capsule two to five valved, two to five celled; seeds covered with a pulp.

Plocama—Calix five-toothed, superior; corolla bell-shaped, five-cleft; berry three-celled; seeds solitary, linear-oblong.

Polycardia—Petals five, roundish; stigma notched; capsule five-celled, five-valved; seeds arilled.

Queria—Calix connivent, five-parted; segments oblong, furnished with an arched callosity; corolla none; filaments of the anthers distinct, intermediate setæ none; stigma subcapitate; capsule utricular, not opening; seed one, subreniform.

Quinchamala—Calix in four unequal segments, superior; corolla funnel-shaped, five-cleft; stigma capitate, undivided; berry dry.

Roella—Corolla funnel-form, with the bottom closed by stameniferous valves; stigma bifid; capsule two-celled (one-celled, Gærtner,) cylindrical, inferior.

Ruyschia—Calix five-leaved; corolla five-petalled, reflexed; style none; berry many-seeded.

Sabbatia—Calix five to twelve parted; corolla rotated, five to twelve parted; stigmas two, spiral; anthers at length revolute; capsule one-celled, two-valved, many-seeded.

Schœffia—Calix double, outer bifid, inferior, inner superior, quite entire; corolla bell-shaped; stigma capitate; drupe one-seeded.

Schwenkfeldia—Involucre four-leaved; corolla funnel-form, hairy within; stigmas five; berry five-celled, many-seeded; (corolla salver-shaped; stigma five-parted, Willdenow.)

Scopolia—Calix inferior, five-cleft; petals five; nectary none; stigma capitate; capsule succulent, of five cells; seeds solitary.

Sheffeldia—Calix five-cleft; corolla bell-shaped; filaments ten, the alternate ones barren; capsule one-celled, five-valved, many-seeded.

Solandra—Calix tubular, bursting; corolla clavate, funnel-form, very large; berry four-celled, many-seeded.

Strelitzia—Spathes universal and partial; perianth none; corolla three-petalled; nectary three-leaved, involving the genitals; capsule three-celled; cells many-seeded.

Symphonia—Calix small, four-toothed, bracteolate at the base; corolla tubular, short, five-cleft, subequal; stigma globose; berry ovate, small, crowned with the persistent calix, four-celled, four-seeded, some of the cells sometimes abortive.

Thoninia—Corolla one-petalled, bell-shaped, hispid on the outside; style simple; drupe coriaceous, of two cells, each two-seeded.

Triguera—Corolla bell-shaped, with an unequal border; nectary short, five-toothed, surrounding the germen; filaments inserted into the nectary; berry four-celled, with two seeds in each cell.

Vangueria—Calix five-toothed; corolla tube globular, with a hairy throat; stigma bilamellate; berry inferior, four or five seeded.

Ventilago—Calix tubular; corolla scales protecting the stamens, which are inserted into the calix; capsule winged at the top, and one-seeded.

Villarsia—Calix five-parted; corolla rotate, five-lobed; segments bearded at the base, with the margins inflected; stigma two-lobed; glands five, alternating with the stamens; capsule one-celled, valveless.

Viola, *Violet*—Calix five-leaved; corolla five-petalled, irregular, horned at the back; anthers cohering; capsule superior, one-celled, three-valved.

Uncaria—Corolla salver-shaped; germen crowned with a gland; stigma two-grooved; pericarp two-celled, many-seeded.

Wabera—Calix superior, in five permanent segments; corolla funnel-shaped, five-cleft; stamens in the mouth of the tube; stigma club-shaped, with ten furrows; berry inferior, of two cells; seeds several, angular.

Walkeria—Calix inferior, in five deep permanent segments; corolla of five petals; drupes five; nuts solitary, kidney-shaped.

Willughbeia—Corolla salver-shaped, contorted; stigma capitate; berry coated, with many angular seeds.

Wilsonia—Calix pitcher-shaped, five-sided, five-toothed; corolla funnel-shaped, of one petal, imbricated in the bud; germen of two seeds; style cloven; stigmas capitate.

Wrightia—Corolla oblique, salver-shaped, mouth crowned with ten divided scales; stamens prominent; follicles two, erect; seeds imbricated downwards, hairy at the lower extremity.

Xylosteum—Flowers in pairs on the summit of the same peduncle; calix five-toothed, bractate at the base; corolla five-cleft or five-lobed; berries by pairs, two-celled, many-seeded.

Ziziphus—Calix flattish, in five deep segments; petals five, opposite to the stamens; drupe superior; nut of one or two cells.

2. DIGYNIA *(Two Pistils.)*

1. *Such as have the lobes of the Corollas bent obliquely to the right.*

Periploca—Calix minute, five-cleft, persistent; corolla rotate, flat, five-parted, orifice surrounded with an urceolate five-cleft crown, terminating in five filiform appendices or awns; style one; stigma capitate, with five angles; follicles two, ventricose; seeds comose.—Or, Nectary encircling the genitals, and putting forth five threads.

Cynanchum, *Base Dog's-bane*—Contorted: nectary cylindric, five-toothed.

Apocynum, *Dog's-bane*—Corolla bell-shaped; nectaries five, alternate with the segments.

Asclepias, *Swallow-wort*—Contorted: nectaries five, ovate, concave, putting out a little horn.

Linconia—Petals five, with a nectareous excavation at the base; capsule two-celled.

Stapelia—Corolla one-petalled, five-cleft; nectary a double

little star, covering the genitals; common stigma pointless; follicles two, smooth; seeds comose.

2. *Monospermous, or single-seeded.*

Herniaria, *Rupturewort*—Calix five-parted; corolla none; stamens, five barren, besides fertile ones; capsule one-seeded.

Chenopodium, *Goosefoot*—Calix five-leaved, five-cornered; corolla none; seed one, lenticular, superior.

Beta, *Beet*—Calix five-leaved; corolla none; seed kidney-form, within the substance of the base of the calix.

Salsola, *Glasswort*—Calix deeply five-cleft; corolla none; capsule one-seeded; seeds screw-shaped.

Anabasis, *Berry-bearing Glasswort*—Calix three-leaved; corolla five-petalled; berry one-seeded, surrounded by the calix.

Cressa—Calix five-leaved; corolla salver-form; filaments sitting on the tube; capsule two-valved, one-seeded.

Gomphrena, *Globe Amaranth*—Calix coloured, outer three-leaved; leaflets two, converging, keeled; petals rude, villose; nectary cylindric, five-toothed; style cloven half way; capsule one-seeded.

Bosea, *Golden Rod Tree*—Calix five-leaved; corolla none; berry one-seeded.

Ulmus, *Elm Tree*—Calix four or five cleft, inferior, permanent; corolla none; capsule membranaceous, compressed, flat, one-seeded.

3. *Polyspermous, or many-seeded.*

Nama—Calix five-leaved; corolla five-parted; capsule one-celled, two-valved.

Hydrolea—Calix five-leaved; corolla wheel-shaped; filaments cordate at the base; capsule two-celled, two-valved.

Henchera—Petals five; capsule two-beaked, two-celled.

Swertia, *Marsh Felwort*—Corolla wheel-shaped, with two nectariferous pores at the base of each segment; capsule one-celled, two-valved; seeds numerous, inserted into the margins of the valves.

Velezia—Calix filiform, five-toothed; corolla five-petalled, small; capsule one-celled; seeds numerous, in a simple row.

Gentiana, *Gentian*—Corolla tubular at the base, destitute of nectariferous pores; capsule superior, of one cell and two valves, with many seeds.

Bumalda—Calix five-petalled; styles villose; capsule two-celled, two-beaked.

Cussonia—Petals three-cornered; margin of the receptacle dilated into a toothed calix.

Melodinus—Corolla contorted; nectary in the middle of the tube, stellate; berry two-celled, many-seeded.

Vahlia—Calix five-leaved; corolla five-petalled, alternate with the stamens; capsule inferior, one-celled, two-valved, crowned with the permanent calix; seeds numerous.

4. *Gymnodispermous, having two naked Seeds, with a simple Umbel.*

Phyllis, *Bastard Hare's Ear*—Stigmas hispid; fructifications scattered; calix two-leaved, obsolete; corolla five-petalled; seeds two.

Eryngium, *Eringo* or *Sea Holly*—Involucre of many-leaves; flowers in little dense heads; common receptacle conical, scaly; seeds bristly.

Hydrocotyle, *Marsh Pennywort*—Calix simple, with a four-leaved involucre; petals entire; seeds semi-orbiculate, compressed.

5. *Gymnodispermous, with an universal and partial Involucre.*

Sanicula, *Sanicle*—Umbels clustered, subcapitate; fruit rough with hooked bristles; central flowers abortive.

Astrantia, *Masterwort*—Partial involucres lanceolate, spreading, equal, longer, coloured; flowers very many, abortive.

Bupleurum, *Thorough-wax* and *Hare's Ear*—Involucres of the umbellule larger, five-leaved; petals involuted; fruit roundish, compressed, striated.

Echinophora, *Prickly Parsnep*—Lateral flowers male, central hermaphrodite; seed one, immersed in an involucel.

Tordilium, *Heartwort*—Corolla radiate; flowers all hermaphrodite; fruit suborbicular, notched at the edge; involucres long, undivided.

Caucalis, *Bastard Parsley*—Corolla radiated in the disk, male; petals inflex, emarginate; fruit hispid with bristles; involucres entire.

Artedia—Involucre pinnatifid; floscules of the disk male; fruit rough with scales.

Daucus, *Carrot*—Corolla subradiate, all hermaphrodite; fruit hispid with hairs; or, according to Gærtner, muricate with prickles, forming longitudinal crests.

Ammi, *Bishop's Weed*—Involucre pinnatifid; corolla radiate, all hermaphrodite; fruit smooth.

Bunium, *Pig Nut*—Corolla uniform; umbel crowded; fruits ovate.

Conium, *Hemlock*—Partial involucre halved, three-leaved; fruit nearly globular, five-streaked, notched on one side.

Selinum, *Marsh Parsley*—Fruit roundish, emarginate at the base; margin alated, dorsal; ridges three, obsolete, intervals somewhat convex; involucre universal and partial, many-leaved.

Athamanta, *Spignel*—Fruit ovate-oblong, striated; petals inflex-emarginate.

Peucedanum, *Sulphurwort*—Fruit ovate, striated on both sides, girt with a membrane; involucres very short.

Crithmum, *Rock Samphire*—Fruit oval, compressed; florets equal.

Hasselquistia—Corolla radiate in the disk, male; seeds in the circumference double, with a notched edge; in the disk solitary, pitcher-shaped, hemispherical.

Cachrys—Fruit subovate, angular, suberous-cortical.

Laserpitium, *Laesrwort*—Petals bent in, emarginate, spreading; fruit oblong, with eight membranaceous angles.

Heracleum, *Cow Parsnep*—Involucre caducous; corolla difform, inflex-emarginate; fruit elliptic, emarginate, compressed; striated, margined.

Ligusticum, *Lovage*—Fruit oblong, five-grooved on both sides; corolla equal, with involute entire petals.

Angelica—Fruit roundish, angular, solid, with reflex styles; corolla equal, with petals bent inwards.

Sium, *Water Parsnep* and *Skirret*—Involucre many-leaved; petals cordate, equal; fruit subovate, striated.

Sison, *Honeywort*—Involucres mostly four-leaved; fruit ovate, striated.

Bubon, *Mecedonian Parsley*—Fruit ovate, striated, villose.

Cuminum, *Cumin*—Involucres four-cleft; umbellules four; fruit ovate, striated.

Œnanthe, *Water Dropwort*—Florets difform; in the disk sessile, barren; fruit crowned with the calix and pistil, its bark corky.

6. *Gymnodispermous, with only one partial Umbel.*

Phellandrium, *Common Water Hemlock*—Florets of the disk smaller; fruit ovate, even, crowned with the perianth and pistil.

Cicuta, *Water Hemlock*—Fruit subovid, furrowed.

Æthusa, *Fool's Parsley*—Partial involucre halved, three-leaved, pendulous; fruit streaked.

Coriandrum, *Coriander*—Corolla rayed; petals inflex-emarginate; involucre universal one-leafed, partial halved; fruits spherical.

Scandix, *Chervil*—Florets of the disk most commonly male; corolla radiate; petals emarginate; fruit awl-shaped.

Chærophyllum, *Cow Weed* and *Chervil*—Involucre reflexed, concave; petal heart-shaped, inflexed; fruit oblong, even.

Imperatoria, *Masterwort*—Fruit roundish, compressed, gibbose in the middle, surrounded by the margin; petals inflex-emarginate.

Seseli, *Meadow Saxifrage*—Umbels globular; involucre of one or two leaflets; fruit ovate, striated.

7. *Gymnodispermous, without any Involucre.*

Thapsia—Fruit oblong, surrounded by a membrane; petals uniform; flowers all fertile.

Pastinaca, *Parsnep*—Fruit elliptical, compressed, flat; petals involute, entire; involucre neither general nor partial.

Smyrnium, *Alexanders*—Petals acuminate, keeled; fruit oblong, striated.

Anethum, *Dill* and *Fennel*—Fruit subovate, compressed, striated; petals involuted, entire.

Carum, *Caraway*—Fruit ovate-oblong, striated; involucre one-leafed; petals keeled, inflex-emarginate.

Pimpinella, *Burnet Saxifrage*—Petals bent in; stigma subglobular; fruit ovate-oblong.

Apium, *Parsley*—Fruit ovate, striated; involucre one-leafed; petals equal.

Ægopodium, *Herb Gerard*—Fruit ovate-oblong, streaked.

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Amsonia—Calix five-parted; corolla funnel-form, orifice closed; follicles two, erect; seed terete, naked, and obliquely truncated.

Anantherix—Calix and corolla five-parted, segments compressed, fistulous and impervious, incurved; stamens as in *Asclepias*; follicles two; seeds comose.

Corrigiola, *Bastard Knot-grass*—Calix five-leaved; petals five; seed one, three-sided.

Crantzia—Umbel simple; calix none; petals entire, roundish, and obtuse; styles minute; stigmas obtuse; fruit subglobose; seeds unequal in size, each with three margined dorsal ribs, and four obtuse angled grooves; involucre about five-leaved.

Dichondra—Calix five-parted; segments spathulate; corolla shortly-campanulate, five-parted; stigma peltate-capitate; capsule subcompressed, two-celled, cells one-seeded; seed globose.

Enslenia—Calix small, five-parted, persistent; corolla five-parted, segments connivent, erect; style none; stigma conic, subbilamellate; follicles two, small.

Erigenia—Calix none; corolla uniform; petals obovate, spreading, entire; styles persistent, subulate, very long; fruit oval, somewhat laterally compressed; seed gibbously convex; involucre none.

Eriocalia—Umbel simple; involucre of many lanceolate, equal, coloured, woolly leaves, longer than the umbel; fruit compressed, hairy; petals none. Many flowers abortive.

Falkia—Calix of one leaf, inferior; corolla of one petal, plaited, funnel-shaped, with ten segments; seeds four, naked.

Ferula, *Fennel-Giant*—Fruit oval, compressed, with three ribs on each side; calix obsolete; general involucre deciduous; flowers uniform, all fertile.

Forgesia—Petals five, rough on their inside; capsule inferior, of two cells and two valves, crowned by the styles.

Gelsemium, *Carolina Jesmine*—Calix five-leaved, very small; corolla funnel-form, border spreading, five-lobed, nearly equal; capsule compressed and flat, bipartile, bilocular; seeds flat, attached to the margins of the valves.

Glyceria—Umbel simple; calix none; petals entire, ovate, acute, incurved; styles very short, subulate; stigmas obsolete; fruit reniform, laterally compressed, flat and truncate; seed quinque-costate, covered with an indurated bark; involucre two-leaved.

Gonolobus—Corolla rotate, five-parted; nectary simple, cylindric, subcarnose, five-lobed, depressed; masses of pollen five pair, even, transverse; follicles two; seed comose.

Kochia—Calix monophyllous, campanulate, five-cleft; in fruiting, producing a dorsal margin in the form of five petals; orifice closed with five triangular dentures; corolla none; style short; stigmas two or three, long; capsule one-celled, one or two seeded; seed incurved.

Marsdenia—Corolla nearly wheel-shaped, five-cleft; crown of the stamens of five compressed undivided leaves, without teeth; anthers terminated by a membrane; masses of pollen ten, smooth, erect; follicles smooth; seeds comose.

Panax, *Gin-seng*.—See *Polygamia Dicecia*.

Psychotria, *Ipecacuanha Plant*—Calix five-toothed, crowning; corolla tubular; berry globular; seeds two, hemispherical, grooved.

Rochefortia—Calix inferior, five-parted; corolla one-petalled, funnel-form, with the aperture open; fruit two-celled, many-seeded.

Stylandra—Calix five-parted, minute; corolla without tube, five-parted; segments long, erect, and connivent; nectary simple, five-parted; tube reversed, very long, supporting the parts of fructification; masses of pollen pendulous, even; follicles two, long and slender; seeds comose.

Thaspium—Fruit subeliptic; seeds convex, with five alated ridges; involucre none; involucel about three-leaved, unilateral.

Wendia—General involucre none, partial obsolete; flowers radiant; calix unequally toothed; fruit nearly orbicular, compressed, notched, with three ribs, and four short intermediate stripes; crowned with the styles, the base of which is winged.

Wylia—General and partial involucral leaves ovate; flowers polygamous, radiant; calix five-toothed; fruit oblong, somewhat compressed, beaked; valves of the beak parallel to the fruit.

Xanthosia—Petals five, ovate, fruit ovate, striated, separable into two parts; involucre of two leaves, single-flowered.

Xysmalobium—Masses of pollen ten, smooth, pendulous; crown simple, in ten deep segments, the intermediate ones minute; corolla spreading; follicles shaggy.

Zosima—General and partial involucre of many permanent leaves; corolla uniform, some flowers male; calix tumid, five-toothed; petals nearly equal, obovate, inflexed; fruit roundish-obovate, compressed, villous, with a corrugated border, the disk ribbed.

3. TRIGYNIA *(Three Pistils.)*

Rhus, *Sumach*—Calix five-parted; petals five; berry one-seeded.

Viburnum, *Laurustinus*, *Wayfaring Tree*, and *Water*

Elder—Calix five-parted, superior; corolla five-cleft; berry one-seeded.

CASSINE, *Hottentot Cherry*—Calix quinquepartite; petals five; berry trispermous.

SAMBUCUS, *Elder*—Calix five-parted; corolla five-cleft; berry three-seeded.

SPATHELIA—Calix five-leaved; petals five; capsule three-cornered, three-celled; seeds solitary.

STAPHYLEA, *Bladder Nut*—Calix five-parted; petals five; capsules inflated, connate; seeds two, globular, with a wart.

TAMARIX, *Tamarisk*—Calix five-parted; petals five; capsule one-celled, three-valved; seeds with a feathery crown.

TURNERA—Calix five-cleft, funnel-form, exterior two-leaved; petals five, inserted into the calix; stigmas multifid; capsule one-celled, three-valved.—Or, Outer calix of two permanent leaves, inner funnel-shaped, five-cleft, deciduous; petals five, inserted into the calix; stigmas many-cleft; capsule superior, of one cell and three valves; seeds numerous, each with a lateral tunic.

TELEPHIUM, *True Orpine*—Calix five-leaved; petals five, inserted into the receptacle; capsule one-celled, three-valved.

PHARNACEUM—Calix five-leaved; corolla none; capsule three-celled, many-seeded.

ALSINE, *Chickweed*—Calix five-leaved; petals five, equal; capsule one-celled, three-valved.

DRYPIS—Calix five-toothed; petals five; capsule clipped, round, one-seeded.

BASELLA, *Malabar Nightshade*—Calix none; corolla seven-cleft, two opposite divisions shorter, at length berried; seed one.

SAROTHRA—Calix five-parted; corolla five-petalled; capsule one-celled, three-valved, coloured.

SEMECARPUS, *Marking-nut Tree*—Calix inferior, five-cleft; corolla five-petalled; nut kidney-form, inserted into a large, fleshy, flattened receptacle.

OCHROXYLUM—Calix five-cleft; petals five; nectary an annular, three-lobed, gland; capsules three, approximating, one-celled, two-seeded.

PASSIFLORA, *Passion Flower*.—See *Gynandria Pentandria*. (Schreber.)

PORTULACARIA, *Purslane Tree*—Calix two-leaved; petals five; seed one, three-sided, and winged.

SALMASIA—Calix five-parted; corolla five-petalled; style none; capsules three-celled, three-valved, many-seeded.

4. TETRAGYNIA *(Four Pistils.)*

PARNASSIA, *Grass of Parnassus*—Calix five-parted; petals five; nectaries five, cordate, ciliate, with globular appices; capsule four-valved.

EVOLVULUS—Calix of five-leaves; corolla five-cleft, wheel-shaped; capsule superior, of four cells; seeds solitary.

5. PENTAGYNIA *(Five Pistils.)*

ARALIA, *Angelica Tree*—Flowers in an umbellule, with an involucre; calix five-toothed, superior; corolla five-petalled; berry five-seeded.

MAHERNIA—Calix five-toothed; petals five; nectaries five, obcordate, placed under the filaments; capsule five-celled.

STATICE, *Thrift*, or *Sea Lavender*—Calix one-petalled, entire, plaited, scariose; petals five; capsule superior, one-celled, five-valved at the base; seeds solitary.

LINUM, *Flax*—Calix five-leaved; petals five; capsule ten-valved, ten-celled; seeds solitary.

ALDROVANDA—Calix five-parted; petals five; capsule five-valved, one-celled, ten-seeded.

DROSERA, *Sundew*—Calix five-cleft; petals five; capsule one-celled, five or three valved at the tip; seeds very many.

CRASSULA, *Lesser Orpine*—Calix one-leafed, five-cleft; petals five; nectareous scales five, at the base of the germen; capsules five, many-seeded.

SIBBALDIA—Calix ten-cleft; petals five, inserted into the calix; styles from the side of the germen; seeds five.

GISEKIA—Calix six-leaved; corolla none; capsules five, approximating, roundish, one-seeded.

COMMERSONIA—Calix one-leafed, bearing the corolla; petals five; nectary five-parted; capsule five-celled, echinate.

BURCARDIA—Calix five-leaved; corolla five-petalled; capsule regular, one-celled, three-valved, seven or eight seeded.

GLOSSOPETALUM—Calix very small, five-toothed; petals five, with a strap at tip of each.

6. DECAGYNIA *(Ten Pistils.)*

SCHEFFLERA—Calix five-toothed; corolla five-petalled; capsule eight or ten-celled; seeds solitary, semicircular.

7. POLYGYNIA *(Having a multitude of Pistils.)*

MYOSURUS, *Mouse-tail*—Calix five-leaved, growing together at the base; petals five, or nectaries five, awl-shaped, resembling petals, having a melliferous pore at the claw; seeds numerous, five or twelve.

XANTHORRHIZA, *Yellow-Root*—Calix none; petals five; nectaries five, abrupt, stalked; capsules five to eight; seeds solitary, pendulous.

CLASS VI.—HEXANDRIA.

Consisting of Plants whose Flowers contain six Stamens, all of the same length; whereas in the Class *Tetradynamia*, the Stamens, though six in number, are unequal in length, four being long, and two of them short.

1. MONOGYNIA *(One Pistil.)*

1. *Such as have trifid Corollas, and a Calix.*

BROMELIA, *Ananas*, or *Pine Apples*—Calix trifid, superior; petals three, and a nectareous scale at the base of each; berry three-celled.

TILLANDSIA, *Wild Pine*—Calix trifid, permanent; corolla tubular, trifid; capsule three-valved; seeds comose.

BURMANNIA—Calix prismatic, coloured, trifid; angles membraneous; petals three; capsule three-celled, straight; seeds minute.

TRADESCANTIA, *Spiderwort*—Calix three-leaved; petals three; filaments erect, with jointed hairs; capsule three-celled.

LICUALA—Flowers all hermaphrodite; calix and corolla three-parted; nectary annular, truncated; drupe single-seeded.

LACHENALIA—Corolla six-parted, the three outer petals differm; capsules three-winged; cells many-seeded; seeds globular, affixed to the receptacle.

2. *Such as have monophyllous Spathes.*

Pontederia—Corolla one-petalled, six-cleft, two-lipped; stamens, three inserted into the top, three into the tube of the corolla; capsule three-celled.

Hæmanthus, *Blood-flower*—Involucre six-leaved, many-flowered; corolla six-parted, superior; berry three-celled.

Galanthus, *Snowdrop*—Corolla superior, of six petals, the three innermost shortest, emarginate; stigma simple.

Leucoium, *Great Spring*, *Summer*, and *Autumnal Snowdrops*—Corolla bell-shaped, six-parted, thickened at the tips; stigma simple.

Tulbagia—Corolla funnel-form, with a six-cleft border; nectary crowning the aperture, three-leaved; leaflets bifid, the size of the border; capsule superior; seeds compressed.

Narcissus, *Daffodil*—Petals six, equal; nectary funnel-form, one-leafed; stamens within the nectary.

Pancratium, *Sea Daffodil*—Petals six; nectary twelve-cleft; stamens placed on the nectary.

Duroia—Calix cylindrical, truncate; corolla six-parted; filaments none; pome hispid.

Nandina—Calix many-leaved, imbricate; corolla six-petalled.

3. *Such as are hexapetalous, and naked,* i. e. *without a Calix.*

Crinum, *Asphodel Lily*—Corolla funnel-form, half-six-cleft; tube filiform; border patulous, recurved; segments subulate, channelled; filaments inserted into the throat of the tube, distinct.

Amaryllis, *Narcissus* and *Lily*—Corolla six-petalled, irregular; filaments inserted into the throat of the tube, bending down, unequal in proportion or direction.

Bulbocodium—Corolla funnel-form, hexapetalous, with narrow claws, bearing the stamens; capsule inferior.

Aphyllanthes—Corolla six-petalled; filaments inserted into the throat of the corolla; capsule superior; glume of the calix univalve, imbricate.

Allium, *Garlick*, *Onion*, *Leek*—Corolla six-parted, spreading; spathe many-flowered; umbel heaped; capsule superior.

Lilium, *Lily*—Corolla six-petalled, bell-snaped, with a longitudinal nectareous line; capsule, the valves connected by cancellated hairs.

Fritillaria, *Crown Imperial*—Corolla inferior, bell-shaped, of six petals, with a nectareous cavity above the claw of each; stamens nearly the length of the corolla; calix none; seeds flat.

Uvularia—Corolla of six upright petals, inferior; nectary a chink in the base of each; stamens shorter than the corolla; stigmas reflexed; capsule triangular, of three valves, with central partitions; seeds several, globose, with a truncated scar.

Gloriosa, *Superb Lily*—Calix six-petalled, waved, reflexed; style oblique.

Tulipa, *Tulip*—Corolla six-petalled, bell-shaped; style none; capsule three-celled; seeds flat.

Erythronium, *Dog's-tooth Violet*—Corolla bell-shaped, of six reflexed petals; nectary two scars at the base of the three inner ones; capsule globose, contracted at the bottom; seeds ovate.

Albuca—Corolla six-petalled, the inner ones difform; stamens, three of the six castrated; stigma surrounded by three cusps.

Ornithogalum, *Star of Bethlehem*—Calix six-petalled, upright, permanent, spreading above the middle; filaments alternate, widening at the base.

Scilla, *Squill*—Corolla six-petalled, spreading, deciduous; filaments filiform; stigma simple; capsule superior, three-celled; seeds roundish.

Hypoxis, *Bastard Star-flower*—Calix a two-valved glume; corolla six-parted, permanent, superior; capsule narrower at the base.

Cyanella—Corolla six-petalled, the three lower petals hanging forwards; stamens, lower declined, longer than the rest.

Asphodelus, *King's Spear*—Corolla six-parted; nectary six valves covering the germen.

Anthericum, *Spiderwort*—Corolla six-petalled, expanding; capsule ovate.

Leontice, *Lion's Leaf*—Calix six-leaved, deciduous; corolla six-petalled; nectary six-leaved, placed on the claws of the corolla, spreading.

Dracæna, *Dragon Tree*—Corolla six-parted, erect; filaments somewhat thicker in the middle; berry three-celled, one-seeded.

Asparagus, *Speerage*—Corolla six-parted, erect, equal; calix none; style very short; stigmas three; berry superior, three-celled, two-seeded.

Massonia—Corolla inferior, with a six-parted border; filaments on the neck of the tube; capsule three-winged, three-celled, many-seeded.

Phormium, *New Zealand Flax Plant*—Calix none; corolla six-petalled, the three inner petals longer; capsule oblong, three-sided; seeds oblong, compressed.

Pollia—Corolla inferior, six-petalled; berry many-seeded.

4. *Monopetalous, and naked.*

Convallaria, *Solomon's Seal*, *&c.*—Corolla six-cleft; berry spotted, three-celled.

Polianthes, *Tuberose*—Corolla funnel-form, curved in, equal; filaments inserted into the mouth of the tube, erect; germen at the bottom of the corolla.

Hyacinthus, *Hyacinth* or *Harebells*—Corolla bell-shaped, with three honied pores by the germen.

Aletris—Corolla funnel-shaped; stamens inserted into the base of the segments; capsule three-celled.

Yucca, *Adam's Needle*—Corolla inferior, bell-shaped, its segments without nectaries; stamens club-shaped; style none; berry hexagonal, of six cells; seeds numerous.

Aloe—Corolla erect, with an expanded mouth, and a nectareous base; filaments inserted into the receptacle.

Agave—Corolla erect, superior; filaments longer than the corolla, erect.

Alstroemeria—Corolla of six petals, sub-bilabiate, the two lower petals tubulose at the base; stamens bending down.

Capura—Calix none; corolla six-cleft; stamens within the tube; germen superior; stigma globular; pericarp a berry.

Hemerocallis, *Day-lily*—Corolla bell-shaped, the tube cylindric; stamens declining.

5. *Such as have a Calix, but the Corolla not trifid.*

Acorus, *Sweet Rush*—Spadix cylindric, covered with floscules; corollas five-petalled, naked; style none; capsule three-celled.

Orontium—Spadix cylindrical, covered with florets; corolla six-petalled, naked; style none; follicles one-seeded.

Calamus, *Rattan*—Calix six-leaved; corolla none; berry dried, one-seeded, imbricate backwards.

Juncus, *Rush*—Calix six-leaved; corolla none; capsule one-celled.

Achras, *Sapota*—Calix six-leaved; corolla ovate, sexfid, with six scales alternate, more within; pome ten-celled; seed solitary, with a scar on the edge, and a tail or process at the top.

Richardia—Calix six-parted; corolla one-petalled, subcylindric; seeds three.

Prinos, *Winter-berry*—Calix six-cleft; corolla one-petalled, wheel-shaped; berry six-seeded.

Berberis, *Barberry*—Calix six-leaved; petals six, with two glands at the claws; style none; berry two-seeded.

Loranthus—Germen inferior; calix none; corolla six-cleft, revolute; stamens at the tips of the petals; berry one-seeded.

Frankenia, *Sea Heath*—Calix five-cleft, funnel-shaped; petals four or five, with a scale upon each claw; stigmas three; capsule superior, of one cell, and three valves.

Hillia—Calix double, lower six-leaved; corolla very long, contorted; capsule two-celled, two-valved, crowned; seeds downy.

Peplis, *Water Purslane*—Calix bell-shaped, with a twelve-cleft mouth; petals six, inserted into the calix, or none.

Canarina, *Canary Bell-flower*—Calix six-leaved; corolla six-cleft, bell-form; stigmas six; capsule inferior, six-celled, many-seeded.

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Agapanthus, *African Blue-lily*—Corolla inferior, funnel-shaped, hexapetaloid, regular.

Brodiæa—Corolla inferior, campanulate, six-parted; filaments of the stamens inserted round the orifice; germen pedicellate; capsule three-celled, many-seeded.

Caulophyllum—Calix three to six leaved; leaves small, unequal, and caducous; petals six, unguiculate, opposite to the calix; nectaries six, seated upon the claws of the petals, carneous, subreniform; anthers growing to the filaments; cells opening by so many vertical elastic valves; drupe stipitate, by abortion one-seeded.

Conostylis—Corolla semi-superior, six-cleft, persistent, woolly; anthers erect; style conic, tripartile; stigma simple; capsule opening at the summit, three-celled, three-valved, many-seeded.

Cyrtanthus—Corolla tubular, club-shaped, crooked, six-cleft; segments ovate-oblong; filaments inserted into the tube, converging at top.

Diphylleia—Calix three-leaved, deciduous; petals six, opposite to the calix; anthers growing to the filaments; cells opening from the base to the summit by so many elastic valves; berry one-celled; seeds two or three, roundish.

Enargea—Calix none; petals six, erect, three of them internal; stigma three-lobed; berry superior, three-celled, many-seeded.

Eriospermum—Corolla of six petals, bell-shaped, permanent; filaments broad at the base; capsule of three cells; seeds invested with wool.

Eucomis—Calix none; corolla inferior, in six deep, spreading, permanent, equal segments; filaments united at their base into a concave nectary, attached to the corolla.

Eustephia—Calix a divided sheath; corolla superior, regular, tubular, cylindrical, in six deep segments; filaments united at their base into a concave nectary, attached to the corolla.

Floerkea—Corolla of three petals, shorter than the calix; style bifid; pericarp none; seeds two or three, membranaceously coated, superior.

Floscopa—Calix inferior, three-cleft; petals three, ovate; capsule of two cells; seeds solitary.

Gahnia—Calix of numerous imbricated glumes; filaments elongated after flowering; style three-cleft; nut with a solitary transversely notched seed.

Gethyllis—Calix none; corolla six-parted; berry club-shaped, radical, of one cell.

Isertia—Calix coloured, four or six toothed; corolla six-cleft, funnel-form; pome subglobular, six-celled, many-seeded.

Lanaria—Corolla superior, woolly, longer than the filaments; border six-parted, somewhat spreading; capsule three-celled.

Laxmannia—Calix one-leafed, four-toothed, inferior; berry four-celled; seeds solitary.

Lindera—Corolla six-petalled; capsule two-celled.

Liriope—Corolla in six deep segments, inferior; sheath ovate; berry single-seeded.

Mahonia—Calix six-leaved, unequal; petals six; nectariferous glands none; filaments irritable, each filiformly bidentate; anthers (as in *Berberis*) growing to the filaments; cells opening by so many vertical elastic valves; berry many-seeded.

Mnasium—Calix one-leafed, three-parted; corolla one-petalled, three-parted; with a very short tube; anthers four-cornered, terminated by an ovate leaflet; germen three-lobed; stigmas three, spiral.

Narthecium—Corolla inferior; petals six, spreading, persistent; filaments filiform, hirsute; capsule prismatic, three-celled, many-seeded; seeds filiformly subulate at each extremity; calix none.

Pitcairnia—Calix three-leaved or three-parted, half-superior; corolla three-petalled, with a scalelet at the base of each petal; stigmas three, contorted; capsules three, opening inwards; seeds winged.

Schradera—Calix a superior rim, quite entire; corolla five or six cleft; stigmas two; berry four-celled, many-seeded. —Or, Involucre universal many-flowered; calix superior, pitcher-shaped; corolla five or six cleft, bell-shaped, hairy at the throat; berry many-seeded.—Willdenow.

Smilacina—Corolla inferior, six-parted, spreading; filaments divergent, attached to the base of the laciniæ; berry globose, three-celled.

Streptopus—Corolla inferior, six-petalled, subcampanulate; stigma very short; berry subglobose, smooth, three-celled; seeds few, hilum naked.

Tacca—Calix six-parted; corolla six-petalled, inserted into the calix, anther-bearing; stigma stellate; berry dry, hexangular, many-seeded, inferior.

Thrinax, *Palmetto Thatch*—Calix six-toothed; corolla none; stigma funnel-form, oblique; berry one-seeded.

Veltheimia—Corolla tubular, with six teeth; stamens inserted into the tube; capsule membranaceous, with three wings and three cells, with solitary seeds.

Urania—Perianth none; corolla three-petalled; nectary two-leaved, with one of the leaves bifid; capsule inferior, three-celled, many-seeded; seeds in two rows, covered with an aril.

Xanthorrhœa, *Yellow Gum*—Corolla inferior, in six deep segments, permanent; filaments flat, linear, naked; capsule triangular, polished; seeds one or two, compressed, bordered.

Xerophyta—Corolla in six deep segments, permanent, the three outermost narrowest, spinous-pointed; stamens inserted into the base of each segment; stigma club-shaped; capsule inferior, of three cells, with many seeds.

2. DIGYNIA *(Two Pistils.)*

Atraphaxis—Calix two-leaved; petals two, sinuate; stigmas capitate; seed one.

ORYZA, *Rice*—Calix glume two-valved, one-flowered; corolla two-valved, almost equal, growing to the seed.
EHRHARTA—Calix a glume of two valves, single-flowered; corolla double, each of two valves, the outer corolla notched at the base.
NECTRIS—Calix six-parted, inferior, the three interior segments petaloid, smaller, and obtuse; corolla none; capsule subcarnose, one-celled, one or two seeded, crowned by the persistent style.
PERIPLOCA—Nectary encircling the genitals, and putting forth five threads.

3. TRIGYNIA *(Three Pistils.)*

FLAGELLARIA—Calix in six deep segments; corolla none; drupe with one seed.
RUMEX, *Dock*—Calix three-leaved; petals converging; seed one, three-seeded.
SCHEUCHZERIA—Calix six-parted; corolla none; styles none; capsules three, inflated, one-seeded.
TRIGLOCHIN, *Arrow Grass*—Calix three-leaved; petals three, calix-form; style none; capsule opening at the base.
MELANTHIUM—Corolla six-petalled; filaments from the elongated claws of the corolla.
MEDEOLA—Calix none; corolla six-parted, revolute; berry three-seeded.
TRILLIUM—Calix three-leaved; corolla three-petalled; berry three-celled.
COLCHICUM, *Meadow Saffron*—Calix a spathe; corolla six-parted, with a rooted tube; capsules three, connected, inflated.
HELONIAS—Calix none; corolla six-petalled; capsule three-celled.
WURMBEA—Calix none; corolla in six deep equal segments, with an hexagonal tube; capsule superior.
CALOCHORTUS—Corolla six-parted, spreading, the three interior segments larger, with the upperside woolly, and marked near the base with a roundish smooth spot; filaments very short, inserted upon the base of the petals; anthers sagittate, erect; stigma reflexed; capsule three-celled.
NOLINEA—Corolla six-parted, spreading; segments subequal; style very short; stigmas recurved; capsule three-sided, membranaceous, three-celled; cells one-seeded; seeds incurved, convex, one or two of them abortive.
SABAL, *Small Fan-palm*—Spathes partial; filaments of the stamens unconnected, thickish at the base; drupe spherical, dry, and cartilaginous, one-seeded; seed indurated. Flowers hermaphrodite.
TOFIELDIA—Calix trifid; petals six; capsules three, superior, united at the base, many-seeded; seeds naked; styles vertical, very short.
XEROPHYLLUM—Corolla sub-rotate; filaments of the stamens contiguous at the base; stigmas three, revolute, partly united below; capsule subglobose, opening at the summit by three chinks, three-celled; cells two-seeded.
ZIGADENUS—Corolla six-parted, spreading; stamens inserted in contact with the germen; styles three, partly united at the base; capsule included in the persistent corolla, subovate, acute, three-celled; cells many-seeded; seeds linear-oblong, apterous.

4. TETRAGYNIA *(Four Pistils.)*

SAURURUS, *Lizard's Tail*—Calix an ament, with one-flowered scales; corolla none; germens four; berries four, one-seeded.—Or, Flowers in an ament, or crowded spike; scales one-flowered; corolla none; filaments and anthers adnate; capsules four, each one, or rarely two seeded, not opening.

5. HEXAGYNIA *(Six Pistils.)*

DAMASONIUM—Spathe one-leafed; perianth one-leafed, three-parted; petals three; berry ten-celled, inferior.
WENDLANDIA—Calix of six leaves; petals six, succulent; styles reclining; capsules six, of one cell; seeds solitary.

6. POLYGYNIA *(Many Pistils.)*

ALISMA, *Water Plantain*—Calix three-leaved; petals three; seeds several, (capsules many, one-seeded, not opening.)

CLASS VII.—HEPTANDRIA.

Consisting of Plants with seven separate or distinct Stamens, in the same Flower with the Pistil or Pistils.

1. MONOGYNIA *(One Pistil.)*

TRIENTALIS, *Chickweed Winter-green*—Calix seven-leaved; corolla seven-parted, equal, flat; berry juiceless.
DISANDRA—Calix seven-leaved; corolla seven-parted, flat; capsule two-celled.
ÆSCULUS, *Horse Chestnut*—Calix one-leafed, five-toothed, ventricose; corolla five-petalled, irregularly coloured, inserted into the calix; capsule three-celled.
PETIVERIA.—See *Hexandria Monogynia.*
PETROCARYA—Calix turbinate, five-cleft, with two bractes at the base; corolla five-petalled, less than the calix; filaments fourteen, seven of which are barren; drupe enclosing a two-celled nut, with a stony cell.
PISONIA.—See *Polygamia Diœcia.*

3. DIGYNIA *(Two Pistils.)*

LIMEUM—Calix five-leaved; petals five, equal; capsule globular, two-celled; seeds solitary, concave.

3. HEPTAGYNIA *(Seven Pistils.)*

SEPTAS—Calix seven-parted; petals seven; germens seven; capsules seven, many-seeded.

CLASS VIII.—OCTANDRIA.

Consisting of such Plants as have Hermaphrodite Flowers, furnished with eight Stamens.

1. MONOGYNIA *(One Pistil.)*

TROPÆOLEUM, *Indian Cress*—Calix one-leafed, with a nectariferous spur; petals four, unequal; nuts three, coriaceous.
OSBECKIA—Calix four-cleft, with the lobe separated by a ciliary scale; corolla four-petalled; stamens eight; anthers beaked; capsule inferior, four-celled, surrounded by

the truncated tube of the calix. Gærtner says, Calix five-cleft, without interculated scales; corolla five-petalled; stamens ten; capsule five-celled.

Rhexia—Calix four-cleft; petals four, inserted into the calix; anthers declining; capsule four-celled, within the body of the calix.

Œnothera, *Tree Primrose*—Calix four-cleft; petals four; capsule cylindrical, inferior; seeds naked, affixed to a four-sided receptacle.

Gaura—Calix four-cleft, tubular; corolla of four petals, ascending towards the upper side; nut quadrangular, one to four seeded.

Epilobium, *Willow Herb*—Calix in four deep segments; petals four; capsule oblong, inferior; seeds feathered.

Melicocca—Calix four-parted; petals four, bent back below the calix; stigma subpeltate; drupe or berry coriaceous.

Grislea—Calix four-cleft; petals four, from the incisures of the calix; filaments very long, ascending; capsule globular, superior, one-celled, containing many seeds.

Amyris, *Shrubby Sweet Wood*—Calix four-toothed; petals four, oblong; stigmas four-cornered; berry drupaceous.

Allophylus—Calix four-leaved; leaflets orbiculate, two opposite smaller; petals four, less than the calix; germs twin; stamens quadrifid.

Combretum—Calix four or five toothed, bell-shaped, superior; corolla four or five petalled, inserted into the calix; stamens very long; seed one, four or five angled, the angles membranaceous.

Fuchsia—Calix superior, coloured, four-cleft, bearing the corolla; petals four; berry of four cells; seeds numerous.

Ximenia—Calix four-cleft; petals four, hairy internally, revolute at the upper part; drupe superior; nut solitary.

Mimusops—Calix four-leaved; petals four; nectary sixteen-leaved; drupe acuminate.—Or, according to Jussieu, Calix eight-parted, in two rows; corolla eight-parted, with the segments entire or three-parted; appendices eight, small, like scales; drupe with one or two seeds.

Memecylon—Calix superior, with a striated base, and the margin quite entire; corolla four-petalled; anthers inserted into the side of the apex of the filament; berry crowned with a cylindrical calix.

Lawsonia—Calix four-cleft; petals four; stamens in four pairs; capsule four-celled, many-seeded.

Vaccinium, *Bilberry*, *Whortleberry*, and *Cranberry*—Calix superior; corolla one-petalled; filaments inserted into the receptacle; berry four-celled, many-seeded.

Erica, *Heath*—Calix of four leaves; corolla four-cleft; stamens inserted into the receptacle; anthers with two pores; capsules superior, of four cells; seeds numerous.

Daphne, *Mezereon* or *Spurge Laurel*—Calix none; corolla four-cleft, corollaceous, withering, including the stamens; berry one-seeded.

Dirca, *Leather-wood*—Calix none; corolla tubulous, with an obscure border; stamens longer than the tube; berry one-seeded.

Gnidea—Calix funnel-form, four-cleft; petals four, inserted into the calix; seed one, somewhat berried.

Stellera—Calix none; corolla mostly four-cleft; stamens very short; nut solitary, beaked.

Passerina, *Sparrow-wort*—Calix four-cleft; corolla none; stamens placed on the tube; seed one, corticate.

Lachnæa—Calix none; corolla four-cleft, with an unequal border; seed one, like a berry.

Antichorus—Calix four-leaved; petals four; capsule superior, subulate, four-celled, four-valved; seeds very many.

Chlora, *Yellow Centaury*—Calix eight-leaved; corolla one-petalled, eight-cleft; capsule one-celled, two-valved, many-seeded; stigma four-cleft.

Dodonæa—Calix four-leaved; corolla none; capsule three-celled, inflated; seeds in couples.

Ophira—Involucre two-valved, three-flowered; corolla four-petalled, superior; berry one-celled.

Guarea—Calix four-cleft; petals four; nectary cylindric, bearing the anthers at its mouth; capsule four-celled, four-valved; seeds solitary.

Bæckia—Calix funnel-form, five-toothed; corolla five-petalled; capsule globular, four-celled, crowned.

Athenæa—Calix coloured, five-parted; corolla none; bristles eight, feathered, between the filaments; stigma five-parted; capsule globose, one-celled, three-valved; seeds three to five.

Cedrota—Calix six-parted; corolla none; germen superior, surrounded by a gland; style short.

Clarkia—Calix four-cleft, tubulous; corolla of four petals, unguiculate, cruciately three-lobed; stamens four, imperfect, with roundish anthers; stigma petaloid, four-lobed; capsule four-celled.

Cupania—Calix five-leaved; petals five, cowled at the top; style trifid; capsule three-celled; seeds solitary, arilled.

Diospyros, *Date-plum*—Hermaphrodite: calix four-cleft; corolla pitcher-shaped, four-cleft; stamens eight; style four-cleft; berry eight-seeded. Male: calix, corolla, and stamens, of the other.

Ephelis—Calix in five deep segments; petals five, with claws; nectary of ten scales, two to each petal; capsule compressed, of one cell and two valves; seeds two, attached to the valves.

Erystathes—Calix of five leaves, inferior; petals five, ovate; berry of one cell, with four seeds.

Jeffersonia—Calix five-leaved, coloured, deciduous; corolla of eight petals, incurvately spreading; stamens receptacular; capsule obovate, one-celled; seeds many, oblong, arilled at the base.

Hedwigia—Calix four-toothed; corolla four-cleft; style none; capsule tricoccous; seed a nut.

Melicope—Calix inferior, four-leaved; petals four; nectary glands four, twin; capsules four, one-seeded.

Menziesia—Calix of one leaf; corolla monopetalous, ovate; filaments inserted upon the receptacle; capsule superior, four-celled; seeds numerous, oblong.

Michauxia—Calix sixteen-parted; corolla wheel-shaped, eight-parted; nectary eight-valved, stameniferous; capsule eight-celled, many-seeded.

Oxycoccus, *Cranberry*—Calix superior; corolla four-parted; filaments connate; anthers tubulose, semibifid; berry many-seeded.

Roxeurghia—Calix four-leaved; corolla four-petalled, inwardly keeled; nectaries four, awl-shaped; leaflets on the apex of the keel, converging; anthers linear, sessile, in the grooves of the keel; capsule one-celled, two-valved; seeds many, inserted into a spongy receptacle.

Valentinia—Calix five-parted, coloured, spreading; corolla none; capsule berried, four-seeded, pulpy.

Vitmannia—Calix four-cleft; corolla four-petalled; nectary a scale at the base of each filament; nut semi-lunar, compressed, one-seeded.

Xylocarpus, *Indian Wooden Pomegranate*—Calix oblong, with four teeth; petals four; nectary inflated, with eight teeth, bearing the anthers; drupe superior, dry, woody, with four or five furrows; nuts numerous, angular, irregular.

2. DIGYNIA *(Two Pistils.)*

GALENIA—Calix four-cleft; corolla none; capsule roundish, of two cells, containing two seeds.

WEINMANNIA—Calix of four leaves; petals four; capsule superior, with two beaks, two cells, and two valves with inflexed margins; seeds several.

MOEHRINGIA—Calix four-leaved; petals four; capsule one-celled, four-valved.

SCHMIDELIA—Calix two-leaved; corolla four-petalled; germens pedicelled, longer than the flower.

CODIA—Calix four-leaved; petals four; common receptacle involucred.

CHRYSOSPLENIUM.—See *Decandria Digynia.*

3. TRIGYNIA *(Three Pistils.)*

POLYGONUM, *Bistort, Snakeweed, Persicaria, Knot Grass,* and *Buck-wheat*—Calix none, or five-parted, coloured; corolla a five-parted calicine, or none, if that be considered as the calix; seed one, angular.—Or, Calix in five deep segments, coloured, petal-like, permanent; seed one, superior, angular, covered by the calix; stamens and style uncertain in number.

COCCOLOBA, *Sea-side Grape*—Calix five-parted, coloured; corolla none; berry calicine, one-seeded.

PAULLINIA—Calix five-leaved; petals four; nectary four-leaved, unequal; capsules three, compressed, membranaceous, connate.

CARDIOSPERMUM, *Heart-seed*—Calix four-leaved; petals four; nectary four-leaved, unequal; capsules three, connate, inflated.

SAPINDUS, *Soap-berry Tree*—Calix four-leaved; petals four; capsule fleshy, connate, ventricose.

PONÆA—Calix five-parted, spreading; petals four, with hairy glands at the tip; germen three-sided; capsule three-winged, three-celled, with one seed in each cell.

BRUNICHIA—Calix at length coriaceous, tubular and ventricose, five-cleft, angular at the base; corolla none; styles short; stigmas bifid; seed one, triquetrous, enclosed by the calix.

4. TETRAGYNIA *(Four Pistils.)*

PARIS, *True-love,* or *One-berry*—Calix four-leaved; petals four, narrower; berry four-celled.

ADOXA—Calix bifid, inferior; corolla four or five cleft, superior; berry four or five celled, united with the calix.

ELATINE—Calix of three or four leaves; petals three or four; capsule superior, of three or four cells, and as many valves, the partitions opposite to the fissures; seeds many.

HALORAGIS—Calix four-cleft, superior; petals four; drupe dry, enclosing a four-celled nut.

FORSKALEA—Calix of four leaves, longer than the corolla; petals eight, spatulate; pericarp none; seeds four, entangled in wool.

CLASS IX.—ENNEANDRIA.

Consisting of Plants bearing Hermaphrodite Flowers, furnished with nine Stamens.

1. MONOGYNIA *(One Pistil.)*

LAURUS, *Cinnamon, Camphor, Sweet Bay,* and *Benjamin Trees*—Calix none; corolla calicine, six-parted; nectary of three two-bristled glands surrounding the germen; filaments, inner glanduliferous; drupe one-seeded.

ANACARDIUM.—See *Polygamia Monœcia.*

CASSYTA—Corolla calicine, sexpartile; nectary of three truncate glands, surrounding the receptacle; interior filaments glanduliferous; drupe monospermous.

GINANNIA—Calix double, both of one leaf; petals three, fringed, spreading; germen, pedicelled, with a membranaceous wing at top.

RHEUM, *Rhubarb*—Calix six-cleft, permanent; seed one, three-sided.

2. TRIGYNIA *(Three Pistils.)*

ERIOGONUM—Calix inferior, coloured, in six deep segments, permanent; capsule membranaceous; seeds solitary, triangular; stigmas simple.

PLEEA—Calix none; corolla six-parted; segments linear, acute; capsule roundish, with three angles, three-celled; seeds numerous, minute, attached to the margins of the valves.

3. HEXAGYNIA *(Six Pistils.)*

BUTOMUS, *Flowering Rush*—Calix none; petals six; capsules six, many-seeded.

CLASS X.—DECANDRIA.

Consisting of Plants having Hermaphrodite Flowers, and ten Stamens, or Male Parts, in each.

1. MONOGYNIA *(One Pistil.)*

1. *Such as have declined Stamens.*

SOPHORA—Calix five-toothed, gibbous above; corolla papilionaceous, with the wings of the same length with the standard; legume headed, many-seeded.

ANAGYRIS, *Stinking Bean Trefoil*—Standard and wings shorter than the keel, in a papilionaceous corolla; fruit a legume.

CERCIS, *Judas Tree*—Calix five-toothed, gibbous below; corolla papilionaceous; standard short, beneath the wings.

BAUHINIA, *Mountain Ebony*—Calix five-cleft, deciduous; petals expanding, oblong, with claws, the upper one more distant, all inserted into the calix.

PARKINSONIA—Calix five-cleft; petals five, ovate, the lowest kidney-form; style none; legume necklace-form.

HYMENÆA, *Locust Tree*—Calix five-parted; petals five, almost equal; style twisted inwards; legume filled with a farinaceous pulp.

CASSIA, *Wild Senna*—Calix pentaphyllous; petals five; the three superior anthers sterile, the three inferior beaked; fruit a legume.

CÆSALPINA, *Barbadoes Flower-fence*—Calix five-parted, the lowest segment longer, and slightly arched; stamens woolly at the base; petals five; legume compressed.

GUILANDINA, *Bonduc,* or *Nichar-tree*—Calix one-leafed, salver-shaped; petals inserted into the neck of the calix, nearly equal; seed-vessel a legume.

GUAIACUM, *Lignum Vitæ*—Calix five-cleft, unequal; petals five, inserted into the receptacle; capsule angular, five-celled.

CYNOMETRA—Calix four-leaved; anthers bifid at the tip; legume fleshy, crescent-shaped, one-seeded.

Swietenia, *Mahogany Tree*—Calix five-cleft; petals five; nectary cylindric, bearing the stamens at the mouth; capsule five-celled, woody, opening at the base; seeds imbricate, winged.

Dictamnus, *Fraxinella*—Calix five-leaved; petals five, patulous; filaments having glandulous dots scattered over them; capsules five, conjoined.

2. *Such as have erect Stamens.*

Ruta, *Rue*—Calix five-parted; petals concave; receptacle surrounded by ten honey dots; capsule lobed.

Toluifera, *Balsam of Tolu Tree*—Calix five-toothed, bell-shaped; petals five, the lowest twice as big, obcordate; style none.

Hæmatoxylum, *Logwood, &c.*—Calix five-parted; petals five; legume lanceolate; valves boat-shaped.

Adenanthera, *Bastard Flower-fence*—Calix five-toothed; corolla five-petalled, bell-shaped; petals concave underneath, convex inwards; anthers roundish, with a globose gland at the outer tip.

Melia, *Bead Tree*—Calix five-toothed; petals five; nectary cylindric, bearing the anthers at its mouth; drupe with a five-celled nucleus.

Trichilia—Calix mostly five-toothed; petals five; nectary toothed, cylindrical, bearing the anthers at the top of the teeth; capsule three-celled, three-valved; seed berried.

Zygophyllum, *Bean Caper*—Calix of five leaves; petals five; nectary of ten scales, embracing the germen, and bearing the stamens; capsule of five cells, superior.

Quassia—Calix five-leaved; petals five; nectary of five scales; pericarps five, distant, each having one seed.

Fagonia—Calix of five leaves; petals five, rounded, with claws; stamens simple; capsule superior, of ten valves and five cells; seeds solitary.

Tribulus, *Caltrops*—Calix five-parted; petals five, spreading; style conical; capsules five or ten, gibbous, spiny, many-seeded.

Thryallis—Calix five-parted; petals five; capsule tricoccous.

Murraya—Calix five-parted; corolla bell-shaped, with a nectary encircling the germen; berry one-seeded.

Monotropa, *Yellow Bird's-nest*—Calix none; corolla pseudo-polypetalous, persistent; segments five, each with a nectariferous base; anthers reniform, horizontal, one-celled; stigma orbicular, naked; capsule five-celled, five-valved; seeds very numerous, minute, subulate.

Jussieua—Calix four or five parted, superior; petals four or five; capsule four or five celled, oblong, gaping at the corners; seeds numerous, minute.

Limonia—Calix five-parted; petals five; berry three-celled; seeds solitary.

Melastoma—Calix five-cleft, bell-shaped; petals five, inserted into the calix, (according to Gærtner, capsule with soft pulp, five-celled, opening in five parts at top.)

Kalmia, *American Laurel*—Calix five-parted; corolla salver-form, with the border five-horned beneath; capsule five-celled.

Dais—Involucre four-leaved; corolla four or five cleft; berry one-seeded.

Bucida—Calix five-toothed, superior; corolla none; berry one-seeded.

Copaifera, *Balsam Capiva Tree*—Calix none; petals four; legume ovate; seed one, with a berried aril.

Samyda—Calix five-parted, coloured; corolla none; nectary bell-shaped, stameniferous; capsule berried within, four or five valved, one-celled; seeds nestling.

Rhododendrum—Calix five-parted; corolla somewhat funnel-form; stamens declined; capsule five-celled.

Andromeda, *Bastard Heath*—Calix five-parted; corolla ovate, or campanulate, quinquefid at the edge; capsule superior, five-celled, with the partitions from the middle of the valves.

Epigæa, *Trailing Arbutus*—Outer calix of three leaves, inner in five deep segments; corolla salver-shaped; capsule of five cells, with a central five-parted receptacle, bearing the seeds.

Gaultheria, *Mountain Tea, Partridge Berry, &c.*—Calix inferior, five-cleft, permanent; corolla ovate; nectary of ten awl-shaped points; capsule of five cells, clothed with the pulpy calix.

Arbutus, *Strawberry Tree*—Calix five-parted; corolla ovate, diaphanous at the base; capsule five-celled.

Cletiira—Calix five-parted; petals five; stigma trifid; capsule three-celled, three-valved.

Pyrola, *Winter Green*—Calix five-parted; petals five; capsule superior, five-celled, opening at the corners, many-seeded; anthers with two pores.

Prosopis—Calix bell-shaped, four or five toothed; stigma simple; legume linear, many-seeded.

Heistéria—Calix five-cleft; petals five; drupe with a very large coloured calix.

Codon—Calix ten-parted, permanent; leaflets alternately shorter; corolla bell-shaped, ten-cleft; nectary ten-celled, composed of ten scales; pericarp two-celled, containing several seeds.

Styrax, *Storax* or *Benjamin Tree*—Calix of one-leaf, inferior; corolla funnel-form, in five equal segments; drupe two-seeded.

Turræa—Calix five-toothed; petals five; nectary toothed, cylindrical, bearing the anthers at the mouth, between the teeth; capsule pentacoccous; seeds two.

Dionæa, *Venus' Fly-trap*—Calix five-leaved; petals five; capsule one-celled, gibbous, containing the seeds.

Ekebergia—Calix in four or five segments; petals four or five; nectary a ring round the germen, bearing the stamens; berry superior, with from two to five seeds.

Inocarpus—Calix bifid; corolla funnel-form; stamens in a double row; drupe one-seeded.

Myroxylum, *Balsam Tree of Peru*—Calix bell-shaped; petals five, the uppermost larger; germen stalked, longer than the corolla; legume one-seeded.

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Aquilaria—Calix five-cleft; nectary pitcher-shaped, half-five-cleft, with bifid clefts; capsule superior, woody, two-celled, two-valved; seed solitary.

Cadia—Calix five-cleft; petals five, equal, obcordate; legume many-seeded.

Chimaphila—Calix five-toothed; petals five; style very short, immersed in the germ; stigma annulate, orbicular, with a five-lobed disk; filaments stipitate; capsule five-celled, opening from the summit.

Cubæa—Calix turbinate, five-parted, unequal, permanent; petals five, unequal; filaments villose, three shorter; germen pedicelled; legume villose, six or seven seeded.

Cyclas—Calix four-parted, spreading, with a short turbinate tube; corolla none; filaments inserted into the neck of the calix; style flexuose; legume roundish, winged, one-seeded.

Enkianthus—Common calix to several flowers; proper one inferior, of five leaves; corolla bell-shaped, five-cleft; berry of five cells, with many seeds.

Gærtnera—Calix in five deep divisions; petals five,

fringed and jagged; one stamen longer than the rest; capsule with four unequal wings, of one cell, without valves.

GOMPHIA—Calix five-leaved; corolla five-petalled; berries one to five, on a large receptacle; seed solitary.

HELICTERES.—See *Gynandria Decandria.* (Schreber.)

HYPOPITHYS, *Pine Sap*—Calix three to five parted; corolla pseudo-polypetalous, persistent; segments four or five, each with a nectariferous base; anthers small, horizontal, one-celled, at length opening flat; stigma orbicular, with a bearded margin; capsule five-celled, five-valved; seeds very numerous, minute, subulate.

LEDUM, *Labrador Tea*—Calix five-cleft; corolla flat, five-parted; capsule five-celled, gaping at the base.

LYONIA—Calix five-toothed; corolla subglobose, pubescent; capsule five-celled; valves five; seeds numerous, subulate.

MYLOCARIUM, *Buckwheat-tree*—Calix five-toothed; petals five; stigma capitate, three-angled, sessile; capsule superior, suberose, two or three winged, three-celled, cells one-seeded; seed subulate.

NICANDRA—Calix turbinate, coloured, four-parted; corolla one-petalled, ten-cleft; germen encircled with a membranaceous wing; stigma peltate, orbicular, six-rayed; berry roundish, six-grooved, three-celled, many-seeded.

PETALOMA—Calix goblet-shaped, five-toothed; petals five, inserted between the teeth of the calix; stamens on the margin of the calix; berry one-celled.

PTEROSPORA—Calix five-parted; corolla monopetalous, ovate; anthers eccentrically peltate, two-celled; capsule five-celled; receptacle five-lobed; seeds very numerous and minute, each furnished with a terminal wing.

PULTENÆA—Calix five-toothed, two-lipped, with an appendage on each side; corolla papilionaceous, the wings shorter than the standard; germen sessile; style awl-shaped; stigma acute; legume of one cell, with two seeds, their appendages lobed and knotched.

RHODORA, *Rose-blossom*—Calix five-toothed; petals three, unequal; stamens declined; capsule five-celled.

SANDORICUM—Calix five-toothed; petals five; nectary cylindrical, truncate, bearing the anthers at its mouth; drupe filled with five seeds.

SCOTIA—Calix tubular, five-cleft; petals five, inserted into the calix, closed by the sides lying over each other.

THERMIA—Calix subcampanulate, half-four-cleft, the upper segments truncate and emarginate; corolla papilionaceous; petals nearly equal in length; vexillum reflected at the sides; carina obtuse; legume compressed and falcate, attenuated at the base, many-seeded.

TOMEX, *Tallow Tree*—Involucre four or five leaved; calix none; corolla five-petalled; nectary scales five, between the lower stamens; berry one-seeded.

VIRGILIA—Calix five-cleft; corolla papilionaceous; petals nearly equal in length; sides of the vexillum not reflected; stigma beardless; legume compressed, oblong, many-seeded.

ZUCCAGNIA—Calix bell-shaped, its border in five permanent segments; petals five, obovate, the upper one broadest, vaulted; legume of one cell, and two valves; seed solitary.

ZWINGERA—Calix in five deep segments; petals five; filament dilated and hairy at the lower part; capsules five, coriaceous, seated on a fleshy receptacle; seed solitary.

2. DIGYNIA *(Two Pistils.)*

ROYENA, *Bladder-nut*—Calix pitcher-shaped; corolla one-petalled, with the border revolute; capsule one-celled, four-valved, (a four-celled berry, Gærtner.)

HYDRANGEA—Capsule two-celled, two-beaked, containing many seeds; corolla five-petalled; calix five-cleft, superior.

CUNONIA—Corolla five-petalled; calix five-leaved; capsule two-celled, acuminate, many-seeded; styles longer than the flower.

CHRYSOSPLENIUM, *Golden Saxifrage*—Calix four or five cleft, coloured; corolla none; capsule two-beaked, one-celled, many-seeded.

SAXIFRAGA, *Saxifrage*—Calix five-parted; corolla five-petalled; capsule two-beaked, one-celled, many-seeded.

TIARELLA—Calix five-parted; corolla five-petalled, inserted into the calix; petals entire; capsule one-celled, two-valved, with one valve larger.

MITELLA—Calix five-cleft; corolla five-petalled, inserted into the calix; petals pinnatifid; capsule one-celled, two-valved, valves equal.

SCLERANTHUS, *Knawel*—Calix one-leafed, inferior; corolla none; seeds two, enclosed in the calix.

TRIANTHEMA—Calix mucronate below the tip; corolla none; stamens five or ten; germen retuse; capsule cut round.

GYPSOPHILA—Calix one-leafed, bell-shaped, angular; petals five, ovate, sessile; capsule globular, one-celled.

SAPONARIA, *Soapwort*—Calix one-leafed, naked; petals five, clawed; capsule oblong, one-celled.

DIANTHUS, *Pink, Carnation, &c.*—Calix cylindric, one-leafed, with four scales at the base; petals five, with claws; capsule cylindric, one-celled.

3. TRIGYNIA *(Three Pistils.)*

CUCUBALUS, *Berry-bearing Chickweed*—Calix inflated; petals five, having claws, but no crown; capsule three-celled.

SILENE, *Catchfly*—Calix one-leafed, ventricose; petals five, with claws crowned at the throat; capsule three-celled.

STELLARIA, *Stitchwort*—Calix five-leaved, spreading; petals five, two-parted; capsule superior, one-celled, many-seeded, six-toothed at top; seeds numerous.

ARENARIA, *Sandwort*—Calix five-leaved, expanding; petals five, entire; capsule one-celled, many-seeded.

CHERLERIA—Calix five-leaved; nectaries five, bifid, resembling petals; anthers alternate, barren; capsule one-celled, three-valved, three-seeded.

GARIDELLA—Calix five-leaved, like petals; nectaries five, two-lipped, bifid; capsules three, connected, containing many seeds.

MALPIGHIA, *Barbadoes Cherry*—Calix five-leaved, with melliferous pores on the outside, at the base; berry one-celled, three-seeded.

BANISTERIA—Calix five-parted, with melliferous pores at the base on the outside; petals roundish, with claws; stigmas leaf-shaped; seeds three, winged with membranes.

TRIOPTEROS—Calix five-parted, with two honey-pores at the base on the outside; petals five, roundish, clawed; filaments cohering at the base; capsules three, one-seeded, three or four winged.

ERYTHROXYLUM, *Redwood*—Calix turbinate; petals five, each with a notched nectariferous scale at its base; stamens connected at their base; drupe of one cell.

HIRÆA—Calix five-leaved; petals roundish, with claws; capsules three, closed, single-seeded, with two or three unequal wings; seeds two, or solitary.

DENTZIA—Calix one-leafed; capsule three-celled; filaments three-cusped.

4. TETRAGYNIA *(Four Pistils.)*

Joncquetia—Capsule five-leaved; petals five, spreading; filaments growing to a glandule; styles none; capsule subglobular, one-celled, five-valved, five-seeded.

6. PENTAGYNIA *(Five Pistils.)*

Averrhoe—Calix five-leaved; petals five, expanding above; pome five-cornered, five-celled.

Spondias, *Hog-Plum*—Calix five-toothed; corolla five-petalled; drupe with a five-celled nut.

Cotyledon, *Navelwort*—Calix five-cleft; corolla one-petalled, with five nectariferous scales at the base of the germen; capsules five.

Sedum, *Stonecrop*—Calix five-cleft; corolla five-petalled; scales nectariferous, five, at the base of the germen; capsules five.

Penthorum—Calix five or ten cleft; petals none, or five; capsule five-cusped, five-celled, (according to Gærtner, compound, five-beaked.)

Oxalis, *Wood Sorrel*—Calix five-parted; petals five, often connected at the base; capsule five-celled, five-cornered, opening at the corners; seeds arilled.

Suriana—Calix five-leaved; petals five; styles inserted into the inner side of the germens; seeds five, naked.

Lychnis, *Campion*—Calix one-leafed, oblong, even; petals five, with claws, and a subbifid border; capsule five-celled, (in some one-celled.)

Agrostemma, *Rose Campion*—Calix one-leafed, coriaceous; petals five, clawed; border obtuse, undivided; capsule one-celled.

Cerastium, *Mouse-ear*, and *Sea Pink*—Calix five-leaved; petals bifid; capsule unilocular, gaping at the tip.

Spergula, *Spurrey*—Calix five-leaved; petals five, entire; capsule ovate, one-celled, with a five-celled nut.

Grielum—Calix deeply five-cleft; petals five; filaments permanent; capsules five, with one seed in each.

Forskahlea.—See *Octandria Tetragynia.*

Bergia—Calix six-parted; petals five; capsule one, globular, with swellings, five-celled, five-valved; valves resembling petals; seeds very many.

6. DECAGYNIA *(Ten Pistils.)*

Neurada—Calix five-parted; petals five; capsule inferior, ten-celled, ten-seeded, prickly.

Phytolacca, *Virginian Poke*—Calix none; petals five, calicine; berry superior, five or ten celled, and as many seeds.

CLASS XI.—DODECANDRIA.

Consisting of Plants having from eleven to nineteen Stamens in each Flower.

1. MONOGYNIA *(One Pistil.)*

Asarum, *Asarabacca*—Calix three or four cleft, placed on the germen; corolla none; capsule coriaceous, crowned; stigma six-cleft.

Bocconia, *Tree Celandine*—Calix two-leaved; corolla none; style bifid; berry dry, one-seeded.

Rhizophora, *Mangrove Tree*—Calix four or five parted; seed one, very long, fleshy at the base.

Blakea—Calix, inferior six-leaved, superior entire; petals six; capsule six-celled, many-seeded.

Garcinia, *Mangostan*—Calix inferior, of four leaves; petals four; berry coriaceous, of several cells, crowned with the stigma; seeds solitary.

Winterana.—See *Polyandria Tetragynia.*

Crateva, *Garlic Pear*—Calix four-cleft; corolla three-petalled; berry one-celled, many-seeded.

Triumfetta—Calix five-leaved; corolla five-petalled; capsule hispid, opening in four parts.

Bassia—Calix four-leaved; corolla eight-cleft; tube inflated; stamens sixteen; drupe five-celled.

Peganum, *Syrian Rue*—Calix five-leaved, or none; corolla five-petalled; capsule three-celled, three-valved, many-seeded.

Portulacca, *Purslane*—Calix bifid, or two-leaved; corolla five-petalled; capsule one-celled, cut round, or three-valved; receptacle (according to Gærtner,) free, distant.

Hudsonia—Calix five-leaved, tubular; corolla none; stamens fifteen; capsule one-celled, three-valved, three-seeded.

Lythrum, *Willow Herb*—Calix twelve-toothed; petals six, inserted into the calix; capsule two-celled, many-seeded.

Ginora—Calix six-cleft; petals six; capsule one-celled, four-valved, coloured, containing many seeds.

Decumaria—Calix eight to twelve leaved, superior; petals eight to twelve; capsule eight-celled, with many seeds.

Bejario—Calix seven-cleft; petals seven; stamens fourteen; berry seven-celled, many-seeded.

Vatica—Calix five-cleft; petals five; anthers fifteen, sessile, four-celled.

Apactis—Corolla four-petalled; calix none.

Canella, *White Cinnamon*—Calix three-lobed; corolla five-petalled; anthers twenty-one, fastened to a pitcher-shaped nectary; berry three-celled; seeds two to four.

Dodecas—Corolla five-petalled; calix half-four-cleft, bearing the corolla, superior; capsule one-celled, connate with the calix.

Eurya—Calix double, the inner of five equal leaves, the outer of two smaller ones; petals five; capsule superior, of five cells and two valves; seeds numerous.

Aristotelia—Calix five-leaved; corolla five-petalled; berry three-celled; seeds two in each cell.

Agathophyllum—Calix superior, very short, toothless; corolla six-petalled, somewhat villose; stamens alternately inserted into the calix and petals; drupe juiceless, with a half-six-celled nut, and one seed.

Banara—Calix six-parted, permanent; corolla six-petalled; germen seated on a glandule; stigma headed; berry globose, one-celled, many-seeded.

Bergera—Calix five-parted; petals five; berry subglobular, one-celled, with two seeds.

Halesia—Calix four-toothed, superior; corolla four-cleft; nut quadrangular, with two seeds.

Kleinhovia—Calix of five leaves; petals five; nectary bell-shaped, five-lobed, bearing the stamens, and affixed to the column of the germen; capsule five-sided, inflated, consisting of five single-seeded cells.

Nitraria—Calix five-cleft; corollas five-petalled, with the petals arched at top; stamens fifteen or more; drupe one-seeded.

Sterculia—Calix five-parted; corolla none; nectary bell-shaped, five-toothed, stameniferous, fastened to the column of the germen; germen pedicelled; capsules five, one-celled, opening by the inner side, many-seeded.

2. DIGYNIA *(Two Pistils.)*

Heliocarpus, *Sun Seed*—Calix four-leaved; style simple; capsule two-celled, compressed, longitudinally radiated on both sides, (according to Gærtner, superior, club-shaped, surrounded with filiform feathered rays.)

Agrimonia, *Agrimony*—Calix five-cleft, fenced with another; petals five; seeds two, at the bottom of the calix.

3. TRIGYNIA *(Three Pistils.)*

Reseda, *Mignonette*—Calix one-leafed, parted; petals laciniate; capsule gaping at the mouth, one-celled, many-seeded.

Euphorbia, *Spurge*—Corolla four or five petalled, placed in the calix; calix one-leafed, bellying; capsule tricoccous.

Pallasia.—See *Syngenesia, Polygamia Frustranea.*

Tacca.—See *Hexandria Monogynia.*

Vismea—Calix five-leaved, inferior; corolla five-petalled; nut two or three celled, half inferior.

4. TETRAGYNIA *(Four Pistils.)*

Aponogeton—Calix an ament; corolla none; capsule three-seeded.

Calligonum—Calix five-parted; corolla none; filaments about sixteen, slightly united at the base; germen superior, four-sided; nut one-celled, with a crust that has several wings, or many bristles.

5. PENTAGYNIA *(Five Pistils.)*

Glinus—Calix five-leaved; corolla none; nectaries eleven bristles; capsule five-cornered, five-celled, five-valved, containing numerous seeds.

6. DODECAGYNIA *(Twelve or more Pistils.)*

Gastonia—Calix of one leaf, superior, entire; petals six, broad at the base; fruit of twelve cells; seeds solitary.

Sempervivum, *Houseleek*—Calix twelve-parted; petals twelve; capsules twelve, many-seeded.

CLASS XII.—ICOSANDRIA.

Consisting of Plants having numerous Stamens, about twenty, or more, *inserted into the Calix*, not into the Receptacle; and indicates, almost infallibly, that the pulpy fruit which accompanies it, is wholesome.

1. MONOGYNIA *(One Pistil.)*

Cactus, *Indian Fig, Melon Thistle, &c.*—Calix one-leafed, superior, imbricate; corolla manifold; berry one-celled, many-seeded.

Eugenia—Calix superior, in four deep segments; petals four; berry of one cell, with one seed.

Philadelphus, *Syringa*, or *Mock Orange*—Calix four or five parted, superior; petals four or five; capsule four or five celled, many-seeded.

Psidium, *Guava*—Calix five-cleft, superior; petals five; berry one-celled, many-seeded.

Myrtus, *Myrtle*—Calix five-cleft, superior; petals five; berry two or three celled; seeds several, gibbous.

Punica, *Pomegranate Tree*—Calix five-cleft, superior; petals five; pome many-celled; seeds numerous, pulpy.

Amygdalus, *Peach* and *Nectarine*—Calix quinquefid, inferior; petals five; drupe having a shell perforated with pores; skin pubescent.

Prunus, *Laurel, Apricot, Cherry*, and *Plum Trees*—Calix five-cleft, inferior; petals five; drupe with a nut, having the sutures prominent.

Plinia—Calix four or five parted; petals four or five; drupe superior, grooved.

Chrysobalanus, *Cocoa Plum*—Calix five-cleft; petals five; style lateral; drupe with a five-furrowed, five-valved nut.

Sonneratia—Calix six-cleft; petals six, awl-shaped; berry many-celled, with several seeds in each cell.

Bartonia—Calix superior, five-cleft, persistent; corolla of ten petals; capsule cylindric-oblong, one-celled, summit flat, valvular; seeds numerous, compressed, arranged horizontally in a double series.

Calyptranthes—Calix superior, truncate, covered with a veil-shaped, deciduous lid; corolla none; berry one-celled, one to four seeded.

Cuphea—Calix ventricose, tubular, six to twelve toothed, unequal; petals six, generally unequal, inserted upon the calix; capsule with the calix, bursting longitudinally, one-celled; seeds few, lenticular, imbricated.

Encalyptus—Calix superior, permanent, truncated, covered before flowering with an entire lid, which soon falls off; capsule of three or four cells, opening at the top; seeds numerous.

Fabricia—Calix half superior, with five teeth; petals five, sessile; stigma capitate; capsule of many cells; seeds winged.

Fœtida—Calix superior, in four permanent segments; corolla none; capsule woody, of four cells, with one or two seeds in each.

Lagerstroemia—Calix six-cleft, bell-shaped; petals six, curled; stamens very many, the six outer thicker than the rest, and longer than the petals.

Leptospermum, *South Sea Myrtle*—Calix five-cleft, half superior; petals five, with claws, longer than the stamens; stigma capitate; capsules three to five celled; seeds angular.

Mentzelia—Calix five-cleft, superior, deciduous; petals five; capsule inferior, one-celled, cylindric, three to six seeded; seeds oblong, partly angular, longitudinally arranged.—*Plumier.*

Metrosideras—Calix five-cleft, half superior; petals five; stamens very long, standing out; stigma simple; capsule three-celled.

Robinsonia—Calix five-toothed; petals five; berry striated, seven-celled; cells one-seeded; seeds villose.

Scolopia—Calix inferior, three or four parted; corolla three or four petalled; berry crowned with the style, one-celled, six-seeded; seeds arilled.

Tigarea—Calix beneath campanulate, five-parted; petals five; capsule folliculiform, gaping with a lateral suture.

2. DIGYNIA *(Two Pistils.)*

Cratægus, *Wild Service* and *Hawthorn Trees*—Calix five-cleft; petals five; berry inferior, two-seeded.

Waldsteinia—Calix in ten segments, the alternate ones smaller; petals five; style club-shaped, deciduous; seeds two, obovate, without awns.

3. TRIGYNIA *(Three Pistils.)*

Sorbus, *Service*, or *Mountain Ash*—Calix five-cleft; petals five; berry inferior, three-sided.

Sesuvium—Calix six-parted, coloured; petals none; capsule ovate, three-celled, cut round, many-seeded.

4. PENTAGYNIA *(Five Pistils.)*

Mespilus, *Medlar*—Calix five-cleft; petals five; berry inferior, five-seeded.

Pyrus, *Pear* and *Apple Trees*—Calix five-cleft; petals five; pome inferior, five-celled; seeds two in each cell.

Tetragonia—Calix three to five parted; petals none; drupe inferior, enclosing a nut, from three to eight celled.

Mesembryanthemum, *Fig Marigold*—Calix five-cleft; petals numerous, linear; capsule fleshy, inferior, many-seeded.

Aizoon—Calix five-parted; petals none; capsule superior, five-celled, five-valved.

Spiræa, *Dropwort* and *Meadow Sweet*—Calix five-cleft; petals five; capsule many-seeded.

5. POLYGYNIA *(Many Pistils.)*

Rosa, *Rose*—Calix pitcher-shaped, five-cleft, fleshy, contracted at the neck; petals five; seeds very many, hispid, fastened to the inner side of the calix.

Rubus, *Bramble*, *Raspberry*, &c.—Calix five-cleft; petals five; berry composed of one-seeded acini.

Fragaria, *Strawberry*—Calix inferior, in ten segments; petals five; receptacles of the seed ovate, pulpy, deciduous.

Potentilla, *Cinquefoil*—Calix ten-cleft; petals five; seeds roundish, naked, fastened to a small juiceless receptacle.

Tormentilla, *Tormentil*—Calix eight-cleft, inferior; petals four; seeds roundish, naked, wrinkled, fastened to a small juiceless receptacle.

Geum, *Avens*, or *Herb Bennet*—Calix ten-cleft; petals five; seeds with a kneed awn.

Dryas—Calix five or ten cleft; petals five to eight; seeds tailed, hairy.

Comarum, *Marsh Cinquefoil*—Calix ten-cleft; petals five, smaller than the calix; receptacle of the seed ovate, spongy, permanent.

Calycanthus, *Virginian Allspice*—Calix one-leafed, pitcher-shaped, squarrose, with coloured leaflets; corolla calycine; styles very many, with a glandulous stigma; seeds very many, tailed, with a succulent calix.

Dalibarda—Calix inferior, five-cleft, spreading; petals five; styles five to eight, long and deciduous; seeds dry.

CLASS XIII.—POLYANDRIA.

Consisting of Plants having upwards of twenty Stamens, *standing upon the Receptacle*, instead of growing from the sides of the Calix, as in the twelfth class. Most of the plants in this class are noxious or unwholesome.

1. MONOGYNIA *(One Pistil.)*

1. *Such as have scarcely any Style.*

Marcgravia—Corolla one-petalled, calyptre-shaped; calix six-leaved, imbricate; berry many-celled, many-seeded.

Rheedia—Calix none; corolla four-petalled; berry three-seeded.

Capparis, *Caper Bush*—Calix four-leaved, coriaceous; petals four; stamens long; berry corticose, one-celled, pedicelled.

Actæa, *Herb Christopher*—Calix four-leaved; corolla four-petalled; berry one-celled; seeds semi-orbicular, in two rows.

Sanguinaria, *Bloodwort*, or *Puccoon*—Calix two-leaved; corolla eight-petalled; silique ovate, one-celled.

Podophyllum, *Duck's-foot*—Calix three-leaved; corolla nine-petalled; berry one-celled, crowned with the stigma.

Chelidonium, *Celandine*—Corolla four-petalled; calix two-leaved; silique one-celled, linear.

Papaver, *Poppy*—Calix two-leaved; corolla four-petalled; capsule one-celled, opening by pores under the permanent stigma.

Argemone, *Prickly Poppy*—Corolla six-petalled; calix three-leaved; capsule half-valved.

Muntingia—Calix five-parted; corolla five-petalled; berry five-seeded, (Gærtner says, many-celled;) seeds many, nestling.

Cambogia—Corolla four-petalled; calix four-leaved; pome eight-celled; seeds solitary.

Sarracenia, *Sidesaddle-flower*—Calix double, outer three-leaved, inner five-leaved; corolla five-petalled; capsule five-celled, with the style having a shield-like stigma.

Nymphæa, *Water Lily*—Calix four, five, or six leaved; corolla many-petalled; berry many-celled, truncated.

2. *Such as have a Style of some length.*

Bixa, *Arnotta*—Corolla ten-petalled; calix five-toothed; calix hispid, bivalve.

Sloanea—Calix one-leafed, from five to nine cleft; corolla none; anthers growing to the filaments below the top; capsule echinate, from three to six celled, with as many valves; seeds two, in a berried aril.

Mammea, *American Mammee*—Calix one-leafed, two-parted; corolla four-petalled; berry very large, four-seeded.

Ochna—Calix five-leaved; corolla five-petalled; berries one-seeded, fastened to a large roundish receptacle.

Calophyllum—Calix four-leaved, coloured; corolla four-petalled; drupe globular.

Grias, *Anchovy Pear*—Corolla four-petalled; calix four-cleft; stigma sessile, cross-shaped; with an eight-furrowed nucleus.

Tilia, *Lime Tree*—Calix five-parted; corolla five-petalled; capsule coriaceous, globular, five-celled, five-valved, opening at the base.

Laetia—Calix five-leaved; corolla five-petalled, or none; fruit one-celled, three-cornered; seeds with a pulpy aril.

Elæocarpus—Petals three to five, torn; anthers with two valves at the summit; calix in three to five segments; drupe superior, with a furrowed crisped nut.

Lecythis—Calix six-leaved; corolla six-petalled; nectary ligulate, stameniferous; pericarp circumcised, many-seeded.

Vateria—Calix five-cleft; corolla five-petalled; capsule three-valved, one-celled, one-seeded.

Thea, *Tea Tree*—Corolla six or nine petalled; calix five or six leaved; capsule tricoccous.

Caryophyllus, *Clove Tree*—Calix four-leaved, duplicate; corolla four-petalled; drupe globular.

Mentzelia—Calix five-leaved; corolla five-petalled; capsule inferior, cylindric, many-seeded.

Delima—Calix five-leaved; corolla none; berry with two seeds.

Cistus, *Rock Rose*—Corolla five-petalled; calix five-leaved, with two of the leaflets smaller; capsule superior, angular, many-seeded.

Prockia—Calix three-leaved, besides sometimes two leaflets at the base; corolla none; berry five-cornered, many-seeded.

Corchorus, *Jews' Mallow*—Corolla five-petalled; calix five-leaved, deciduous; capsule many-valved, many-celled.

Seguieria—Calix five-leaved; corolla none; capsule one-seeded, terminated by a large wing, and having small lateral ones; seeds solitary.

Loosa—Calix five-leaved, superior; corolla five-petalled; petals hooded; nectary five-leaved, converging; capsule turbinate, one-celled, three-valved, many-seeded.

Trewia—Calix three-leaved, superior; corolla none; capsule tricoccous.

Trilix—Calix three-leaved; corolla three-petalled; berry five-celled, many-seeded.

Alstonia—Corolla one-petalled, eight or ten cleft; clefts alternated.

Sparrmannia—Calix four-leaved; corolla of four reflexed petals; nectaries several, torulose; capsule angular, five-celled, echinated.

Ternstrœmia—Calix four-parted; corolla one-petalled, wheel-shaped, with the border bell-shaped, five or six parted; anthers thick at the tip; berry juiceless, two-celled.

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Ascium—Calix five-leaved, coriaceous; corolla five-petalled; berry? one-celled, with very many seeds.

Aubletia—Calix five-leaved; corolla five-petalled; capsule many-celled, echinate, with many seeds in each cell.

Befaria—Calix seven-cleft; petals seven; stamens fourteen; capsule seven-celled, many-seeded.

Bonnetia—Calix five-parted, two parts longer; corolla five-petalled, three smaller upright, two larger declinate; capsule oblong, three-celled, three-valved, many-seeded.

Dicera—Petals four or five, obovate, trifid; nectary of four or five emarginate corpuscles; anthers two-horned.

Doliocarpus—Calix five-leaved; corolla three-petalled, plaited; stigmas subbifid; berry globular, crowned with the style, one-celled, two-seeded.

Grewia.—See *Gynandria Polyandria.*

Helianthemum—Segments of the calix mostly unequal, the two exterior smaller; petals five; capsule superior, one-celled, three-valved; valves septiferous in the centre.

Hudsonia—Calix inferior, unequally three-parted, tubular, and coloured, two of the segments obsolete; petals five; stamens fifteen to twenty; capsule one-celled, three-valved, one to three seeded; seeds granulated.

Legnotis—Calix five-cleft; petals five, jagged, inserted into the receptacle; capsules three-celled.

Lemniscia—Calix five-toothed; corolla five-petalled, recurved; nectary cup-shaped, girding the germen; pericarp five-celled; seeds solitary.

Lewisia—Calix seven to nine leaved; petals fourteen to eighteen; style trifid; capsule trilocular, polyspermous; seeds shining.

Mappia—Calix five-parted; corolla five-petalled; germen superior; berry one-seeded; seed arilled.

Marila—Calix five-leaved; corolla five-petalled; capsule four-celled, many-seeded; stigma simple.

Myrodendrum—Corolla five-petalled, spreading, much larger than the five-toothed calix; stigma capitate, five-lobed; pericarp five-celled, with one seed in each cell.

Nuphar, *Yellow Pond Lily*—Calix five or six leaved; petals many, minute, inserted with the stamens upon the receptacle, externally nectariferous; stigma orbicular, radiated, sessile; capsule carnose, many-celled, many-seeded, superior.

Rittera—Calix four-leaved; petal one, lateral; legume one-celled, two-valved.

Ryania—Calix five-leaved, permanent, coloured; corolla none; stigmas four; berry suberous, one-celled, many-seeded.

Sterbeckia—Calix three or five leaved; corolla three or five petalled; capsule corticose, not opening, legume-shaped, many-seeded.

Swartzia—Calix four-leaved; petal single, lateral, flat; legume one-celled, bivalve; seeds arillated.

Talinum—Calix two to five leaved, inferior; petals five; capsule one-celled, three-valved, many-seeded; receptacle globose; seeds arillate.

2. DIGYNIA *(Two Pistils.)*

Pæonia, *Pœony*—Calix five-leaved; petals five; styles none; capsule many-seeded.

Curatella—Calix five-leaved; petals four; styles two; capsule two-parted, with two seeds in each cell.

Fothergilla—Capsule inferior, truncated, entire; corolla none; germens combined; capsules of two valves; seeds solitary, bony.

Lacis—Calix and corolla none; filaments winged on both sides below; receptacle girt with twelve spines; capsule ovate, eight-streaked, one-celled, two-valved, many-seeded.

Trichocarpus—Calix four or five parted; corolla none; styles two, bifid; capsule bristly, one-celled, four-valved, many-seeded.

3. TRIGYNIA *(Three Pistils.)*

Delphinium, *Larkspur*—Calix none; petals five; nectary cloven, produced into a horn behind; siliques three, or one.

Aconitum, *Wolf's-bane*—Calix none; petals five, the highest arched, shaped like a hood or helmet; nectaries two; peduncle recurved; capsules three or five.

Homalium—Calix six or seven parted; corolla six or seven petalled; stamens twenty-one, in three bodies; pericarp one-celled, many-seeded.

4. TETRAGYNIA *(Four Pistils.)*

Tetracera—Calix five or six leaved; corolla four or five petalled; filaments widening above, and anther-bearing on each side; capsules one to four, opening on the side; seed arilled at the base.

Caryocar—Calix five-parted; petals five; styles usually four; drupe with four nuts.

Cimicifuga, *Stinking Bugbane*—Calix four or five leaved; nectaries four, urceolate; capsules four to seven.

Rhizobolus—Calix half-five-cleft; petals five; germen four-sided, superior; nuts four, one-celled, one-seeded.

Wintera, *Winter's Bark*—Calix splitting unequally; petals numerous; stamens club-shaped, with terminal two-lobed anthers; styles none; berries superior, aggregate; seeds several, in a double row.

5. PENTAGYNIA *(Five Pistils.)*

Aquilegia, *Columbine*—Calix none; petals five; nectaries five, horned, between the petals; capsules five, distinct.

NIGELLA, *Fennel Flower*—Calix none; petals five; nectaries five, or more, two-lipped, within the corolla; capsules as many, (according to Gærtner, separate, beaked, opening inwards.)

REAUMARIA—Calix six-leaved; petals five; capsule one-celled, five-valved, many-seeded.

BRATHYS—Calix five-leaved; petals five; nectary none; capsule one-celled, many-seeded.

WORMIA—Calix inferior, of five coriaceous permanent leaves; petals five; anthers with two terminal pores; capsules five, compressed, distinct, many-seeded; styles thread-shaped; stigmas notched.

6. POLYGYNIA *(Many Pistils.)*

DILLENIA—Calix five-leaved; petals five; capsules many-seeded, connate, filled with pulp.

LIRIODENDRON, *Tulip Tree*—Calix three-leaved; petals six; seeds imbricated with a strobile.

MAGNOLIA, *Laurel-leaved Tulip Tree*—Calix three-leaved; petals nine; capsule one-celled, two-valved; seeds berried, pendulous.

MICHELIA—Calix three-leaved; petals sixteen; berries many, four-seeded.

UVARIA—Calix three-leaved; petals six; berries numerous, pendulous, four-seeded.

ANNONA, *Custard Apple*—Calix three-leaved; petals six; berry many-seeded, roundish, with a scaly bark.

ANEMONE, *Wind-Flower*—Calix none; petals six or nine; seeds many.

ATRAGENE—Calix four-leaved; petals twelve; seeds tailed.

CLEMATIS, *Virgin's Bower*—Calix none; petals four, sometimes five, or even six; seed having a tail.

THALICTRUM, *Meadow Rue*—Calix none; petals four or five; seeds tailless.

ADONIS, *Pheasant's Eye*—Calix five-leaved; petals five or more, without a neetary; seeds naked.

ILLICIUM, *Aniseed Tree*—Calix six-leaved; petals twenty-seven; capsules several, disposed in a circle, bivalve, one-seeded.

RANUNCULUS, *Crowfoot*—Calix five-leaved; petals five to eight, with a honied pore at the claw; seeds naked.

TROLLIUS, *Globe Flower*—Calix none; petals about fourteen; capsules numerous, ovate, many-seeded.

ISOPYRUM—Calix none; petals five; nectary trifid, tubular; capsule recurved, many-seeded.

HELLEBORUS, *Hellebore*, or *Aconite*—Calix none; petals five or more, (or calix five-leaved; corolla none;) nectaries two-lipped, tubular; capsule many-seeded.

CALTHA, *Marsh Marigold*—Calix none; petals five; nectary none; capsules several, many-seeded.

HYDRASTIS, *Yellow Root*—Calix none; petals three; nectary none; berry composed of one-seeded acini, or granulations.

UNONA—Calix three-leaved; petals six; berries two or three seeded, jointed like a necklace.

BRASENIA, *Water Shield*—Calix six-leaved, petaloid, persistent, the three interior longer; corolla none; stamens eighteen to thirty-six, about the length of the calix.

COPTIS, *Golden Thread*—Calix none; petals five or six, caducous; nectaries five or six, cucullate; capsules five to eight, stellately diverging and rostrate, many-seeded.

CYAMUS, *Water Chinquepin*—Calix petaloid, four or five leaved; petals many; fruit turbinate, with a truncated disk excavated with numerous cells, each containing a single seed; seed an ovate nut crowned with the permanent style.

EUCRYPHIA—Calix of five small leaves; petals five, covered before expansion with a deciduous veil; capsule of many cells, separating at top and bottom; seeds winged, imbricated.

HEPATICA, *Noble Liverwort*—Calix three-leaved; petals six to nine; seeds naked.

PORCELIA, *Papaw*—Calix three-leaved; petals six; stigmas sessile, obtuse; berries, one or more, large, cylindric or ovate, many-seeded; seeds arilled, attached to the internal suture.

XYLOPIA, *Bitter-wood*—Calix lobed, coriaceous; petals six, the three outermost largest; capsules stalked, angular, compressed, of two valves; seeds one or two, tunicated.

CLASS XIV.—DIDYNAMIA.

Consisting of Plants having four Stamens, two of which are long, and two short: the short Stamens stand next together, and adjoining to the Style of the Pistil.

1. GYMNOSPERMIA.

(In this Order, the seeds have no covering, but are enclosed till ripe in the permanent calix, instead of a pericarp.)

1. *Such as have the Calix quinquefid, and nearly equal.*

AJUGA, *Bugle*—Corolla, upper lip very small; stamens longer than the upper lip.

TEUCRIUM, *Germander*, *Ground Pine*, and *Marum*—Corolla, upper lip two-parted beyond the base, divaricating; stamens prominent.

SATUREIA, *Savory*—Corolla with segments nearly equal; stamens distant; calix almost equally five-cleft.

THYMBRA—Calix subcylindrical, two-lipped, scored on each side with a villose line; style semi-bifid.

HYSSOPUS, *Hyssop*—Corolla, lower lip with a small middle crenate segment; stamens straight, distant.

NEPETA, *Catmint*—Corolla, lower lip with an intermediate segment, crenate; throat reflex at the edges; stamens approximating.

LAVANDULA, *Lavender*—Calix ovate, obscurely toothed, supported by a bracte; corolla, upper lip bifid, linear, straight.

BETONICA, *Betony*—Calix awned; corolla, upper lip ascending, flattish; tube cylindric.

SIDERITIS, *Ironwort*—Calix five-cleft; corolla ringent, upper lip bifid, lower three-parted; stamens within the tube of the corolla; the shorter stigma involving the other.

MENTHA, *Mint* and *Pennyroyal*—Corolla almost equal, four-cleft, the broader segments emarginate; stamens upright, distant.

GLECHOMA, *Ground Ivy*—Calix five-cleft; each pair of anthers converging in form of a cross.

PERILLA—Calix, uppermost segment very short; stamens distant; styles two, connected.

LAMIUM, *Archangel*—Corolla, upper lip entire, vaulted; lower, two-lobed; throat with a reflex toothlet on each side.

GALEOPSIS, *Hedge Nettle*—Calix five-cleft, awned; upper lip of the corolla notched, vaulted; lower with two teeth on its upper side.

STACHYS, *Woundwort*—Calix five-cleft, awned; corolla, upper lip arched, lower reflexed at the sides, the middle

segment larger, emarginate; stamens finally reflexed towards the sides.

Ballota, *Black Horehound*—Calix salver-shaped, five-toothed, ten-streaked; corolla, upper lip crenate, concave.

Marrubium, *White Horehound*—Calix salver-shaped, rigid, ten-streaked; corolla, upper lip bifid, linear, straight.

Leonurus, *Motherwort*—Anthers having dots sprinkled over them.

Phlomis, *Jerusalem Sage*—Calix angular; corolla, upper lip incumbent, compressed, villose.

Moluccella, *Molucca Balm*—Calix bell-shaped, widening, broader than the corolla, spiny.

2. *Such as have the Calix divided into two lips.*

Clinopodium, *Field Basil*—Involucre many-bristled, under the whorl.

Origanum, *Marjoram*—Strobile four-cornered, spiked, with one leaf to each calix.

Thymus, *Thyme*—Calix two-lipped, its mouth closed with hair; corolla, upper lip flat, emarginate.

Melissa, *Baum*—Calix dry, flattish above; upper lip subfastigiate, bifid; lower lip bifid, linear, straight.

Dracocephalum, *Dragon's-head*—Corolla, throat inflated; upper lip concave.

Melittis, *Bastard Baum*—Calix wider than the tube of the corolla; corolla, upper lip flat, lower crenated; anthers crosswise.

Ocymum, *Basil*—Calix with the upper lip orbiculate, the lower four-cleft; corolla resupine, with one lip four-cleft, the other undivided; filaments, the outer putting forth a reflex process at the base.

Trichostema—Corolla, upper lip sickle-shaped; stamens very long; calix two-lipped.

Scutellaria, *Skull-cap*—Calix with an entire mouth; after flowering closed by a lid.

Prunella, *Self-heal*—Filaments forked, with an anther on one of the forks; stigma bifid.

Cleonia—Filaments forked, with an anther at one of the tips; stigma four-cleft.

Prasium, *Shrubby Hedge Nettle*—Berries four, one-seeded.

Phryma—Calix two-lipped, five-toothed; seed one.

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Bystropogon—Calix five-subulate, bearded at the opening; corolla, upper lip bifid, lower trifid; stamens distant.

Cornutia—Calix five-toothed; stamens, two of them longer than the corolla; style very long; berry globular, one-seeded.

Elsholtzia—Calix tubular, five-cleft; corolla ringent; upper lip four-toothed, lower longest, undivided, finally crenate; stamens distant.

Galeobdolon—Calix five-cleft, unequal, awned; upper lip of the corolla entire, vaulted, lower in three acute segments.

Gloxinia—Calix superior, five-leaved; corolla bell-shaped, with the border oblique; filaments four, with the rudiment of a fifth, inserted into the receptacle.

Hyptis—Calix turbinate; corolla with a very spreading border; lower lip semi-bifid; anthers hanging down.

Isanthus—Calix subcampanulate; corolla five-parted; tube straight and narrow; segments of the border ovate and equal; stamens subequal; stigmas linear, recurved.

Leucas—Calix ten-striate, six to ten toothed; upper lip of the corolla galeate; lower lip long and trifid; lobes of the anthers divaricate; stigma shorter than the upper lip.

Lippia—Calix four-toothed, roundish, upright, compressed-membranaceous; capsule one-celled, two-valved, two-seeded, straight; seeds two-celled.

Macbridea—Calix subturbinate, trifid, two of the segments larger and oval, the third linear-lanceolate; corolla ringent; upper lip entire, the lower shorter and three-parted.

Plectranthus—Calix, upper segment large; corolla resupine, gibbous, or spurred at the base; filaments simple.

Pycnanthemum, *Mountain Mint*—Calix tubular, striate, five-toothed; upper lip of the corolla nearly entire, lower trifid; middle segment longer; stamens distant; cells of the anthers parallel.

Selago—Calix four-cleft; corolla, tube capillary; border almost equal; seed one or two.

Synandra—Calix four-cleft, segments unequal, subulate; upper lip of the corolla entire and vaulted, the lower obtusely and unequally three-lobed; orifice inflated, naked; upper pair of anthers cohering, having the two attached cells empty; filaments tomentose.

Westringia—Calix five-cleft half way down, five-seeded; upper lip of the corolla flat, cloven, lower in three deep equal segments; stamens distant, the two upper with halved anthers, two lower with divided abortive ones.

2. ANGIOSPERMIA.

(In this Order, the seeds are enclosed in a seed-vessel, or pericarp.)

1. *Such as have a simple Stigma, and personate Corollas.*

Bartsia—Calix two-lobed, emarginate, coloured; corolla coloured, less than the calix; upper lip longest; capsule two-celled.

Rhinanthus, *Yellow Rattle*—Calix four-cleft, ventricose; capsule two-celled, blunt, compressed.

Euphrasia, *Eyebright*—Calix cylindrical, four-toothed, equal; upper lip of the corolla cloven, lower three-lobed, the lobes cloven; anthers bearded with unequal spines; capsule ovate-oblong; seeds striated.

Melampyrum, *Cow Wheat*—Calix four-cleft; corolla, upper lip compressed, with the edge folded back; capsule two-celled, oblique, opening on one side; seeds two, gibbous.

Lathræa, *Toothwort*—Calix four-cleft; gland depressed at the base of the suture of the germen; capsule one-celled.

Schwalbea—Calix four-cleft, the upper lobe very small, the lowest large and emarginate.

Tozzia—Calix tubular, five-toothed; corolla ringent, with five rounded segments; capsule one-celled, globular, two-seeded.

Pedicularis, *Lousewort*—Calix five-cleft; capsule two-celled, mucronate, oblique; seeds coated.

Gerardia—Calix five-cleft; corolla two-lipped, lower lip three-parted, the lobes emarginate, the middle segment two-parted; capsule of two cells, gaping.

Chelone—Calix five-parted; rudiment of a fifth filament between the upper stamens; capsule two-celled.

Gesneria—Calix five-cleft, sitting on the germen; corolla incurved and recurved; capsule inferior, two-celled.

Antirrhinum, *Snapdragon*, or *Calves'-snout*—Calix five-leaved; corolla with the base produced downwards, and nectariferous; capsule two-celled.

Cymbaria—Calix ten-toothed; capsule cordate, two-celled.

2. *With a simple Stigma and spreading Corollas.*

Craniolaria—Calix double of the flower; perianth four leaved; spathe one-leafed; corolla, tube very long; capsule of *Martynia*.

Martynia—Calix five-cleft; corolla ringent; capsule woody, corticate, with a hooded beak, four-celled, two-valved.

Torenia—Calix two-lipped, upper lip three-cusped; filaments, the lower with a sterile branchlet; capsule two-celled.

Scrophularia, *Figwort*—Calix five-cleft; corolla subglobular, resupine; capsule superior, two-celled.

Celsia—Calix five-parted; corolla rotated; filaments bearded; capsule two-celled.

Digitalis, *Foxglove*—Calix five-parted; corolla bell-form, five-cleft, bellying; capsule ovate, two-celled.

Bignonia, *Trumpet Flower*—Calix five-cleft, cup-form; corolla, throat bell-form, five-cleft, ventricose beneath; silique two-celled; seeds membrane-winged.

Brunfelsia—Calix five-toothed, narrow; corolla with a very long tube; capsule one-celled, many-seeded, with a very large fleshy receptacle.

Citharexylum, *Fiddlewood*—Calix five-toothed, bell-form; corolla funnel-wheel-form; segments above villose, equal; berry two-seeded; seeds two-celled.

Halleria, *African Fly Honeysuckle*—Calix trifid; corolla quadrifid; filaments longer than the corolla; berry superior, two-celled.

Crescentia, *Calabash Tree*—Calix two-parted, equal; corolla gibbous; berry pedicelled, one-celled, many-seeded; seeds two-celled.

Gmelina—Calix slightly four-toothed; corolla four-cleft, bell-shaped; anthers two-parted, two simple; drupe with a two or three celled nut.

Petrea—Calix five-parted, very large, coloured; corolla wheel-shaped; capsule two-celled, at the bottom of the calix; seeds solitary.

Lantana—Calix obscurely four-toothed; stigma hook-refracted; drupe with a two-celled nucleus.

Loeselia—Calix four-cleft; corolla with all the segments directed one way; stamens opposite the petals; capsule three-celled.—Or, according to Gærtner, Calix five-toothed; corolla deeply five-cleft, with oblong ciliated segments; stamens five, unequal; capsule gaping at top.

Capraria, *Goat-weed*—Calix five-parted; corolla bell-form, five-cleft, acute; capsule bivalve, bilocular, many-seeded.

Hebenstreitia—Calix emarginate, cleft underneath; corolla one-lipped, lip ascending, four-cleft; stamens inserted into the edge of the border of the corolla; capsule containing two seeds.

Erinus—Calix five-leaved; corolla, border five-cleft, equal, with the lobes emarginate; upper lip very short, reflex; capsule two-celled.

Buchnera—Calix obscurely five-toothed; corolla, border five-cleft, equal, lobes cordate; capsule two-celled.

Limosella, *Mudwort*—Calix five-cleft; corolla five-cleft, equal; stamens approximating by pairs; capsule one-celled, two-valved, many-seeded.

Hemimeris—Calix five-parted; corolla wheel-form, upper lip cloven, with a nectariferous bag at the base.

Castilleia—Calix tubular, compressed, upper lip bifid, lower none; corolla, lower lip trifid, with two glands between the segments; capsule two-celled.

Thunbergia—Calix double, outer two-leaved, inner many-toothed; corolla bell-shaped; capsule beaked, two-celled.

Amasonia—Corolla tubulous, border small, quinquefid; nut ovate, one-celled.

3. *With a double Stigma.*

Stemodia—Calix five-parted; corolla two-lipped; filaments four, cloven, two-anthered; capsule two-celled.

Obolaria—Calix two-leaved, or none, except two bractes; corolla four-cleft, bell-shaped; stamens from the slits of the corolla; capsule one-celled, two-valved, many-seeded.

Orobanche, *Broom Rape*—Calix bifid; corolla ringent; capsule one-celled, two-valved, many-seeded: a gland under the base of the germen.

Dodartia—Calix five-toothed; corolla, lower lip twice as long as the upper; capsule two-celled, globular.

Sesamum, *Oily Grain*—Calix five-parted; corolla bell-shaped, five-cleft, the lower lobe larger; rudiment of a fifth filament; stigma lanceolate, divided; capsule four-celled.

Mimulus, *Monkey Flower*—Calix four-toothed, prismatical; corolla ringent, the upper lip folded back at the sides; capsule two-celled, many-seeded.

Ruellia—Calix five-parted; corolla subcampanulate; stamens approximating by pairs; capsule opening by elastic teeth.

Barleria—Calix four-parted; stamens, two far less than the others; capsule quadrangular, bilocular, bivalvular, elastic, without the claws; seeds two.

Durante—Calix five-cleft, superior; berry four-seeded; seeds two-celled.—Or, according to Gærtner, Calix five-toothed; corolla funnel-shaped, five-cleft; berry one-celled, containing four two-celled stones.

Ovieda—Calix five-cleft; corolla, tube cylindrical, superior, very long; border three-lobed, or three-cleft; berry globular, one-celled, quadripartile, four-seeded.

Volkameria—Calix five-cleft; corolla, segments directed the same way; drupe two-celled; nuts two-celled, with two kernels.

Clerodendrum—Calix five-cleft, bell-shaped; corolla with a filiform tube, and a funnel-shaped, five-parted, equal border; stamens very long, gaping very much between the segments; berry one-celled, with four stones, and a single seed in each.

Vitex, *Chaste Tree*—Calix five-toothed; corolla, border two-lipped; middle segment of the lower lip largest; drupe one-seeded, a four-celled nut.

Bontia, *Barbadoes Wild Olive*—Calix five-parted; corolla two-lipped, lower lip three-parted, revolute; drupe ovate, one-seeded, with the end oblique.

Columnea—Calix five-parted; corolla ringent, upper lip three-parted, the middle part vaulted, emarginate, gibbous above at the base; anthers connected; capsule two-celled; seeds nestling.

Acanthus, *Bear's Breech*—Calix two-leaved, bifid; corolla one-lipped, bent down, trifid; capsule two-celled.

Pedalium—Calix five-parted; corolla subringent, with a five-cleft border; nut suberous, four-cornered, thorny at the corners, two-celled; seeds two.

Avicennia—Calix five-parted; corolla two-lipped, upper lip square; capsule coriaceous, rhomboidal, one-seeded.

Vandellia—Calix four-parted; corolla ringent; filaments, the two outer from the disk of the lip of the corolla; anthers connected by pairs; capsule one-celled, many-seeded.

Manulea—Calix five-parted; corolla with a five-parted, awl-shaped border, the upper segments more connected; capsule two-celled, many-seeded.

Besleria—Calix five-parted; berry subglobular, many-seeded.

Lindernia—Calix five-parted; corolla ringent, with the upper lip very short; stamens, the two lower with a terminating tooth, and a sublateral anther; capsule one-celled.

Premna—Calix two-lobed; corolla four-cleft; berry four-celled; seeds solitary.

Hyobanche—Calix seven-leaved; corolla ringent, without any lower lip; capsule two-celled, many-seeded.

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ALECTRA—Corolla bell-shaped; filaments bearded; capsule two-celled.

BROWALLIA—Calix five-toothed; corolla, border five-cleft, equal, spreading, with the navel closed; anthers, two larger; capsule one-celled.

CITHAREXYLUM, *Fiddlewood*—Calix five-toothed, bell-form; corolla funnel-wheel-form; segments above villose, equal; berry two-seeded; seeds two-celled.

COLLINSIA—Calix five-cleft; corolla bilabiate, orifice closed, upper lip bifid, lower trifid; capsule globose, partly one-celled, and imperfectly four-valved; seeds two or three, umbilicate.

CONOPEA—Calix five-cleft; corolla ringent, two-lipped, lower lip trifid; stigma two-lobed; capsule one-celled, four-valved, many-seeded.

CYRILLA—Calix superior, five-leaved, linear-lanceolate; corolla declined, funnel-form; tube cylindric, gibbous on its lower edge; throat tricoccous; border inclined, five-parted; segments roundish, the three lower more produced; filaments inserted into the margin of the corolla, incurved, with a fifth barren; anthers cohering; germen inferior, half-emerging, with a nectareous lid; style bent down; stigma two-lobed; capsule half-two-celled, with two-parted receptacles; seeds numerous.

HERPESTIS—Calix five-cleft, unequal, bibracteate at the base; corolla tubular, subbilabiate; stamens included, all fertile; capsule two-valved, two-celled.

LINNÆA—Calix double, of the fruit two-leaved, of the flower five-parted, superior; corolla bell-shaped; berry dry, three-celled.

MAURANDIA—Calix inferior, in five deep segments; corolla ringent; tube bell-shaped, furrowed; capsule of two cells, opening by five teeth at their summit.

MELIANTHUS, *Honey-flower*—Calix five-leaved, the lower leaf gibbous; petals four, with the nectary within the lowest.

MYOPORUM—Calix five-parted; corolla bell-shaped, with a spreading, almost equal, five-parted border; berry one or two seeded; seeds two-celled.

ORTHOCARPUS—Calix tubular, semiquadrifid; corolla bilabiate, closed; upper lip smaller, compressed, with the margin inflected; lower concave, obsoletely three-toothed, unexpanded; anthers unconnected, lobes unequal, divaricate; capsule straight, elliptic-ovate, two-celled, two-valved, many-seeded, opening on both sides; seeds small, with an alated lunate margin.

PENTSTEMON—Calix five-leaved; corolla bilabiate, ventricose; rudiment of a fifth stamen, bearded above; capsule two-celled.

RUSSELIA—Calix five-leaved, setaceous at the end; corolla, tube very long, hairy at the throat, border two-lipped, lower lip trifid; capsule acuminate, one-celled, two-valved, many-seeded.

SEYMERIA—Calix five-parted nearly to the base; corolla rotate-campanulate, almost equally five-lobed; stamens scarcely unequal, subsessile, inserted near the orifice; anthers oblong, naked; style declinate; capsule ventricose, ovate, acute, two-celled, two-valved, opening at the summit.

SIBTHORPIA, *Moneywort*—Calix five-parted; corolla five-parted, equal; stamens in remote pairs; capsule compressed, orbicular, two-celled, with the partition transverse.

SPIELMANNIA—Calix five-cleft; corolla bearded at the throat, with a five-celled almost equal border; drupe with a two-celled tuberculated nut.

TANÆCIUM—Calix cylindrical, truncate; corolla tubular, almost equal, five-cleft; rudiment of a fifth filament; berry corticose, two-celled, many-seeded.

TOURRETTIA—Calix two-lipped; corolla, lower lip none, but two toothlets instead of it; capsule echinated, four-celled, two-valved.

ZAPANIA—Flowers capitate; calix five-toothed; corolla five-lobed; stamens four, fertile; stigma peltately capitate, oblique; seeds two, at first covered by an evanescent utriculus.

CLASS XV.—TETRADYNAMIA.

Consisting of Plants having six Stamens in each Flower four long and two short.

1. SILICULOSA.

(The character of this Order consists in the *silicula*, or pod, being broad and globular; that is, a roundish flat seed-vessel, furnished with a style, which is frequently as long as the seed-vessel itself.)

MYAGRUM, *Gold of Pleasure*—Silicle terminated by a conical style, with a cell commonly one-seeded.

VELLA, *Cress Rocket*—Silicle with a partition twice as large as the valves, ovate on the outside.

ANASTATICA, *Rose of Jericho*—Silicle retuse, crowned at the edge with valves twice as long as the partitions; style intermediate, pointed, oblique; cells one-seeded.

SUBULARIA, *Awlwort*—Silicle entire, ovate; valves ovate, concave, contrary to the partition; styles shorter than the silicle.

DRABA, *Whitlow Grass*—Silicle entire, oval-oblong; valves flattish, parallel to the dissepiment; style none.

LEPIDIUM, *Pepperwort* and *Cress*—Silicle emarginate, cordate, many-seeded; valves keeled, contrary.

THLASPI, *Bastard Cress* and *Shepperd's Purse*—Silicle emarginate, obcordate, many-seeded; valves boat-shaped, margined, and keeled.

COCHLERIA, *Scurvy Grass*—Silicle emarginate, turgid, scabrous; valves gibbous, obtuse.

IBERIS, *Candy-tuft*—Corolla irregular, with the outer petals larger; silicle emarginate, many-seeded, (in some species, one seed only in each cell.)

ALYSSUM, *Madwort*—The shorter filaments marked with a toothlet; silicle emarginate.

PELTARIA—Silicle entire, suborbiculate, compressed, flat, not opening.

CLYPEOLA, *Treacle Mustard*—Silicle emarginate, orbiculate, compressed, flat, deciduous.

BISCUTELLA, *Buckler Mustard*—Silicle compressed, flat, rounded above, and below two-lobed; calix leaflets gibbous at the base.

LUNARIA, *Moonwort*, or *Honesty*—Silicle entire, elliptic, compressed, flat, pedicelled; valves equal, and parallel to the partition, flat; calix with bagged leaflets.

CAKILE, *Sea Rocket*—Silicle sublanceolate, four-angled, biarticulate, separating at the articulation; articulations dissimilar, the lower emarginate, one-seeded, and valveless.

CORONOPUS, *Wart Cress*—Silicle reniform, compressed, and corrugated; cells valveless, one-seeded.

ISATIS, *Dyer's Woad*—Silicle lanceolate, one-celled, one-seeded, deciduous, bivalve; valves navicular.

2. SILIQUOSA.

(In this Order, the seed-vessel is a *siliqua*, or long pod.)

RICOTIA—Silique one-celled, oblong, compressed, with flat valves.

DENTARIA, *Toothwort*—Silique bursting elastically, with valves rolled back; stigma emarginate; calix converging lengthwise.

CARDAMINE, *Lady's Smock*—Silique opening elastically, the valves revolute; stamens entire; calix rather gaping.

SISYMBRIUM, *Water Cress* and *Wild Rocket*—Silique opening with straightish valves; calix and corolla spreading.

ERYSIMUM, *Hedge-Mustard*—Pod straight, columnar, exactly square; calix leaves cohering; stigma capitate.

CHEIRANTHUS, *Wall* and *Stock July-flower*—Germen with a glandulous toothlet on each side; calix closed with two leaflets, gibbous at the base.

HELIOPHILA—Nectaries two, bowed back towards the bladder of the calix.

HESPERIS, *Rocket*—Petals bent obliquely; a gland within the shorter stamens; silique stiff; stigma with a forked base and converging tip; calix closed.

ARABIS, *Wall Cress*—Nectareous glands four, one within each leaflet of the calix, like a reflex scale.

TURRITIS, *Tower-Mustard*—Silique very long, angular; calix converging, erect; corolla erect.

STANLEYA—Calix very large, rectangularly cruciate, divergent, coloured; petals erect; stamens subequal; glands four, two outside, and two inside the corolla; silique stipitate, bilocular, bivalve; seeds oblong, flattish.

BRASSICA, *Cabbage*—Calix erect, converging; seeds globular: a gland between the shorter stamens and the pistil, and between the longer and the calix.

SINAPIS, *Mustard*—Calix spreading; corolla, claws erect: a gland between the shorter stamens and pistil, and between the longer stamens and calix.

RAPHANUS, *Radish*—Calix closed; siliques torose, subarticulate, cylindrical; nectariferous glands four, two between each shorter stamen and the pistil, and two between the longer stamens and the calix.

BUNIAS, *Sea Rocket*—Silique deciduous, four-sided, muricated with unequal acuminate angles.

CRAMBE, *Sea Colewort*—Filaments, the four longer two-cleft at the end, one only of the tips bearing an anther; berry dry, globose, deciduous.

CLEOME, *Bastard Mustard*—Nectariferous glands three, at each sinus of the calix, except the lowest; petals all ascending; silique one-celled, two-valved.

CLASS XVI.—MONADELPHIA.

Consisting of Plants whose Filaments are united into one parcel, or set, more or less complete.—The *Orders* are distinguished by the number of Stamens, easily determined at their upper part, bearing the Anthers, where they are always, for a considerable distance, separate and distinct.

1. TRIANDRIA *(Three Stamens.)*

APHYTEIA—Calix large, funnel-shaped, semi-trifid; petals three, inserted into the throat of the tube in the calix, and shorter than it

GALAXIA—Spathe of one or two leaves; corolla regular, of one petal, in six deep segments, with an elongated tube; style one; stigmas three, in numerous capillary segments; capsule inferior, of three cells; seeds globose.

FERRARIA—Spathe inflated; petals six, regular, crisped and fringed; stigmas three, petal-like, fringed; capsule of three cells; seeds roundish.

MYRISTICA.—See *Dicœcia Monadelphia.*

RENEALMIA—Calix none; petals six, regular, three inner ones largest, contracted at the base; style one; stigmas three, thread-shaped, involute, acute; capsule inferior, obovate, of three cells; seeds angular.

SISYRINCHIUM—Spathe two-leaved; corolla none; petals six, almost equal; style one; capsule three-celled, inferior.

TAMARINDUS, *Tamarind Tree*—Calix four-parted; petals three; nectary of two short bristles under the filaments; legume pulpy within.

2. PENTANDRIA *(Five Stamens.)*

WALTHERIA—Calix double, the outer lateral, of three leaves, deciduous; petals five; style one; capsule of one cell, and two valves; seed solitary.

LERCHEA—Calix five-toothed; corolla funnel-form, five-cleft; anthers five, placed on the tube of the germen; style one; capsule three-celled, many-seeded.

HERMANNIA—Styles five; capsule five-celled; petals semi-tubular at the base, oblique.

MELOCHIA—Styles five; capsule five-celled, one-seeded.

SYMPHONIA—One-styled: Corolla globular, five-petalled; berry five-celled; seed solitary.

ERODIUM, *Crane's Bill*—Calix of five leaves; petals five; nectariferous glands five; barren filaments five; fruit beaked, of five aggregate capsules, each tipped with a long spiral awn, bearded on the inside.

OCHROMA, *Down Tree*—Calix double, outer three-leaved; anthers connate, irregularly furrowed; capsule five-celled, many-seeded.

OPLOTHECA—Calix double; exterior two-leaved, scariose, convolute, truncated and much shorter than the interior; interior calix monopetallous, semiquinquefid and densely tomentose; corolla none; nectary cylindric, five-toothed, stameniferous; stigma simple, capitate, pubescent; utriculas one-seeded, enclosed in the indurated muricate calix.

OZOPHYLLUM—One-styled: Calix five-toothed; petals five, long; filaments sheathing the style, five-toothed at top; teeth antheriferous; stigma one; capsule five-celled.

PASSIFLORA, *Passion Flower.*—See *Gynandria Pentandria.*

PHILOXERUS—Calix five-parted; corolla none; stamens five, combined at the base into a small entire cup, shorter than the germ; anthers one-celled; stigmas two; utriculus membranaceous, one-seeded, valveless.

3. HEPTANDRIA *(Seven Stamens.)*

PELARGONIUM, *Crane's Bill*—Calix five-parted, the upper segments ending in a capillary, nectariferous tube, running along the flower-stalk; corolla five-petalled, irregular; filaments ten, unequal, three of which, seldom five, are castrated; fruit five-grained, beaked; beak spiral, bearded within.

4. OCTANDRIA *(Eight Stamens.)*

AITONIA—Calix unequally bifid; corolla double, outer five-cleft, inner five-petalled; legume two-celled.

Pistia—Calix none; corolla one-petalled, tongue-shaped, entire; anthers six or eight, placed on the filament; style one; capsule one-celled, at the bottom of the corolla.

5. DECANDRIA *(Ten Stamens.)*

Connarus, *Ceylon Sumach*—Style one; stigma simple; capsule two-valved, one-celled, one-seeded.

Geranium, *Crane's Bill*—Calix five-leaved; corolla five-petalled, regular; nectary five honied glands, fastened to the base of the longer filament; fruit five-grained, beaked; beaks simple, naked, neither spiral nor bearded.

Hugonia—Five-styled: Corolla five-petalled; drupe with a striated nut.

Brownea—Calix unequally bifid; corolla double, outer five-cleft, inner five-petalled; legume two-celled.

Crinodendrum—Calix none; corolla bell-shaped, six-petalled; capsule one-celled, gaping elastically at top.

Helicteres.—See *Gynandria Decandria.*

6. DODECANDRIA *(Twelve to Fifteen or Nineteen Stamens.)*

Pentapetes—Calix double, outer three-leaved, inner five-parted; stamens fifteen, with five ligules, petal-shaped; capsule five-celled, many-seeded.

Monsonia—Calix five-leaved; corolla five-petalled; stamens fifteen, united into five filaments; style five-cleft; capsule five-grained.

Acia—Calix five-parted; corolla five-petalled, unequal; drupe full of chinks.

Assonia—Calix double, outer one or three leaved, inner one-leafed; corolla five-petalled, without any tube affixed to the pitcher of stamens; filaments connected in the form of a pitcher, with petal-shaped straps between them; styles one or five; capsule five-celled; seeds not winged.

Plagianthus—Calix five-cleft; petals five, two approximating, remote from the other three.

Pterospermum—Calix simple, five-parted; corolla five-petalled; filaments fifteen, with five ligules, one between every three filaments; capsule five-celled, with the cells two-valved; seeds many, winged.

7. POLYANDRIA *(More than Twenty Stamens.)*

Bombax, *Silk Cotton Tree*—Calix five-cleft; stamens five or more; capsule woody, five-celled, five-valved; seed woody; receptacle five-cornered.

Sida, *Indian Mallow*—Calix simple, angular; style in numerous divisions; capsule of several bivalve cells, spreading from a centre.

Adansonia, *Monkey's Bread*—Calix simple, deciduous; style very long; stigmas many; capsule woody, ten-celled, with faninaceous pulp, and many seeds.

Althæa, *Marsh Mallow*—Calix double, outer nine-cleft; arils many, one-seeded.

Alcea, *Hollyhock*, or *Rose Mallow*—Calix double, outer six-cleft; arils many, one-seeded.

Malva, *Mallow*—Calix double, outer three-leaved; capsules many, united in a depressed whorl, one-celled, one-seeded.

Lavatera, *Tree Mallow*—Calix double, outer trifid; arils very many, one-seeded.

Malope—Calix double, outer three-leaved; arils glomerated, one-seeded.

Urena—Calix double, outer five-cleft; capsule five-celled, divisible into five parts, with the cells closed, and one seed in each.

Gossypium, *Cotton*—Calix double, outer trifid; capsule four-celled; seeds wrapped in cotton.

Hibiscus, *Syrian Mallow*—Calix double, the outer of many leaves or segments; stigmas five; capsule of five cells, with several seeds.

Stuartia—Calix in five deep segments; styles simple, with a five-cleft stigma; pome juiceless, five-lobed, one-seeded, opening five ways.

Camellia, *Japan Rose*—Calix imbricate, many-leaved, the inner leaflets larger.

Morisonia—Calix simple, bifid; petals four; pistil one; berry with a hard rind, one-celled, many-seeded, pedicelled.

Mesua, *Indian Rose Chestnut*—Calix simple, four-leaved; corolla four-petalled; nut four-cornered, one-seeded.

Malachra—Calix, common three-leaved, many-flowered, larger; arils five, one-seeded.

Gordonia, *Loblolly Bay*—Calix five-leaved; petals five, united at the base by means of the nectary; capsule superior, five-celled; seeds winged.

Gustavia—Calix none; petals several; berry many-celled: seed appendicled.

Carolinea—Monogynous: Calix simple, tubular, truncate; petals ensiform; pome five-grooved, two-celled.

Barringtonia—Calix simple, two-leaved, superior, permanent; fruit a dry four-cornered drupe, enclosing a nut, one to four celled.

Solandra.—See *Pentandria Monogynia.*

Crossostylus—Calix simple, four-parted; corolla four-petalled; nectary twenty corpuscles between the filaments; stigmas four, jagged.

Glabraria—Calix five-cleft; petals five; nectary composed of five bristles, the length of the calix; stamens thirty, always in sixes; pericarp a drupe.

Lugunæa—Calix simple, five-cusped; style simple; stigma peltated; capsule five-celled, five-valved.

Myrodia—Calix simple, one-leafed; corolla five-petalled; anthers undivided; drupe dry, enclosing two nuts.

Napæa.—See *Dœcia Monadelphia.*

Ruizia—Calix double, the exterior three-leaved; styles ten; capsules ten, one-celled, two-seeded, closely cohering.

Styrax.—See *Decandria Monogynia.*

Symplocos—Calix five-cleft; corolla five-petalled, or from five to ten, united at the base; stamens in four rows, growing to the tube of the corolla; fruit five-celled.

CLASS XVII.—DIADELPHIA.

Consisting of Plants whose Flowers are butterfly-shaped, the Stamens of which are united by their Filaments into two sets, or parcels: their number may be either equal in each set, or unequal; the bases of each parcel quite separate to the bottom, or united to a greater or less distance upwards.

1. PENTANDRIA *(Five Stamens.)*

Monnieria—Calix five-parted, with the upper segment oblong; corolla ringent; stamens two, the upper with two anthers, the lower with three; capsules five, one-seeded.

PETALOSTEMON—Petals five, nearly equal, four of them alternating with the stamens, and uniting with them in a cloven tube; legume one-seeded, included in the calix.

2. HEXANDRIA *(Six Stamens.)*

FUMARIA, *Fumitory*—Calix of two leaves, inferior; corolla ringent, gibbous and honey-bearing at the base; each filament bearing three anthers.

SARACA—Calix none; corolla funnel-form, four-cleft; filaments three on each side the throat; legume pedicelled.

3. OCTANDRIA *(Eight Stamens.)*

POLYGALA, *Milkwort*—Calix five-leaved, with two of the leaves shaped like wings, and coloured; capsule obcordate, two-celled.

SECURIDACA—Calix three-leaved; corolla papilionaceous, with the standard two-leaved, within the wings; legume ovate, one-celled, one-seeded, ending in a ligulate wing.

4. DECANDRIA *(Ten Stamens.)*

1. *Such as have monadelphous Filaments, or one set of Brotherhoods.*

NISSOLIA—Calix five-toothed; capsule one-seeded, ending in a ligulate wing.

ERYTHRINA, *Coral Tree*—Calix two-lobed; standard much longer than the keel; wings minute; legume cylindrical, with many convex seeds.

PISCIDIA, *Dogwood Tree*—Stigma acute; legume winged four ways.

BORBONIA—Calix acuminate, spiny; stigma emarginate; legume mucronate.

SPARTIUM, *Broom*—Calix produced downwards; filaments adhering to the germen; stigma longitudinal, villose above.

GENISTA, *Broom*, and *Needle Furze*—Calix two-lipped, the upper lip with two teeth, lower with three; standard oblong, bent backwards from the rest of the flower.

ASPALATHUS—Calix five-cleft, the upper divisions largest; legume ovate, awnless, with about two seeds.

AMORPHA—Standard of the corolla ovate, concave; wings none; keel none.

CROTOLARIA, *Rattlewort*—Legume turgid, inflated, pedicelled; filaments connate, with a fissure on the back.

ONONIS, *Rest Harrow*—Calix five-parted, with linear segments; banner striated; legume turgid, sessile; filaments connate, without a fissure.

ANTHYLLIS, *Kidney Vetch*—Calix swelling; legume roundish, concealed.

EBENUS, *Ebony of Crete*—Calix with teeth the length of the corolla; wings scarcely any; seed one, rough with hairs.

ABRUS, *Jamaica Wild Liquorice*—Calix obscurely four-lobed, the upper lobe broadest; filaments nine, united into a sheath at bottom, gaping at the back; stigma blunt; seed subglobose.

PTEROCARPUS, *Dragon's Blood*—Calix five-toothed; capsule sickle-shaped, leafy, varicose; seeds few, solitary.

ULEX, *Furze*—Calix two-leaved; legume scarcely longer than the calix; filaments all connected.

ARACHIS, *Ground Nut*—Calix bilabiate; corolla resupine; filaments connected; legume gibbous, torulose, veined, coriaceous.

LUPINUS, *Lupine*—Calix two-lipped; anthers, five oblong, five roundish; legume coriaceous.

2. *Such as have diadelphous Filaments, or two Brotherhoods, and a downy Stigma.*

PHASEOLUS, *Kidney Bean*—Keel, with the stamens and styles, spirally twisted.

DOLICHOS, *Cow Itch*—Two parallel oblong calluses at the base of the standard, compressing the wings underneath.

GLYCINE—Calix two-lipped; corolla, the keel turning back the banner at the tip.

CLITORIA—Corolla inverted; standard very large, spreading, overshadowing the wings.

PISUM, *Pea*—Style triangular, above keeled, pubescent; calix with the two upper segments broadest.

OROBUS, *Bitter Vetch*—Calix blunt at the base, the upper teeth deeper and shorter; style linear.

LATHYRUS, *Chickling Vetch*—Calix, two upper segments shorter; style flat, villose above, broad at the end.

VICIA, *Vetch* and *Bean*—Stigma transversely bearded on the lower side.

CICER, *Chick Pea*—Calix five-parted, length of the corolla, the four upper segments incumbent on the banner; legume rhombed, turgid, two-seeded.

ERVUM, *Tare* or *Lentil*—Stigma capitate, hairy all over.

3. *Such as have diadelphous Filaments, bilabiate Calices, and the Stigma not downy.*

CYTISUS, *Laburnum*—Calix two-lipped, upper lip two-cleft, lower three-toothed; legume attenuated at the base.

GEOFFROYA, *Bastard Cabbage Tree*—Calix five-cleft; drupe ovate; nut flatted.

ROBINIA, *False* and *Rose Acacia*—Calix four-cleft, the upper segment divided; stamens in two distinct sets; legume gibbous, elongated.

COLUTEA, *Bladder Senna*—Calix five-cleft; legume inflated, gaping on the upper suture at the base.

GLYCYRRHIZA, *Liquorice*—Calix two-lipped, upper lip three-parted, lower undivided; legume ovate, compressed.

CORONILLA, *Scorpion Senna*—Calix two-thirds two-lipped, the upper teeth connate; standard scarcely longer than the wings; legume contracted between the seeds.

4. *Such as have diadelphous Filaments, Stigmas that are not downy, and Calices not bilabiate.*

ORNITHOPUS, *Bird's Foot*—Legume jointed, round, bowed.

HIPPOCREPIS, *Horse-shoe Vetch*—The essential character consists in the horse-shoe form of the legume.

SCORPIURIS, *Caterpillar*—Legume divided by isthmuses, or transverse partitions, revolute, cylindrical.

HEDYSARUM, *French Honeysuckle*—Corolla, keel transversely obtuse; legume jointed, with one seed in each joint.

ÆSCHYNOMENE—Calix bilabiate; legume with truncate one-seeded joints.

INDIGOFERA, *Indigo*—Calix spreading; keel of the corolla with an awl-shaped, spreading spur on each side; legume linear.

GALEGA, *Goat's Rue*—Calix with subulate teeth, nearly equal; legume with oblique streaks between the seeds.

PHACA, *Bastard Vetch*—Legume two-celled.

ASTRAGALUS, *Milk Vetch*—Legume two-celled, gibbous.

BISERRULA, *Hatchet Vetch*—Legume two-celled, flat; partition contrary.

PSORALEA—Calix besprinkled with callous dots, the same length with the legume; stamens in two distinct sets; legume single-seeded, somewhat beaked, without valves.

TRIFOLIUM, *Trefoil*—Calix tubular, five-cleft; keel simple, shorter than the wings and banner; stigma smooth; legume scarcely longer than the calix, not opening, deciduous.

LOTUS, *Bird's-foot Trefoil*—Calix tubular; wings converging longitudinally upwards; legume cylindrical.

Liparia—Calix five-cleft, with the lowest segment elongated; corolla, wings two-lobed below; stamens, the larger with three shorter teeth; legume ovate.

Trigonella, *Fenugreek*—Banner and wings nearly equal, spreading in form of a three-petalled corolla.

Medicago, *Moon Trefoil* and *Lucern*—Legume compressed, bent in; keel bent down from the banner.

Mullera—Pericarp elongated, fleshy, necklace-form, with one-seeded globules.

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Amerimnum, *Jamaica Ebony*—Calix two-lipped; legume compressed, leafy, two-valved, gaping; seeds few, solitary.

Amphicarpa—Calix campanulate, four-toothed, obtuse and naked at the base; petals all oblong; vexillum broader and incumbent, subsessile; anthers round; stigma capitate; germ cylindrically sheathed at the base; legume flat, and stipitate, two, three, or four seeded.

Cylista—Calix very large, four-parted, the upper division cleft at the base; corolla permanent.

Dalbergia—Filaments two, four-cleft at top; fruit pedicelled, not opening, leguminous, membranaceous, compressed.

Dalea—Calix semiquinquefid; corolla partly papilionaceous; wings and carina adnate to the undivided column of the stamens; legume one-seeded, included in the calix.

Dimorpha—Petal, one large, convolute, in place of the keel; standard and wings none.

Diphysa—Calix half-five-cleft; legume with a bladder on each side; seeds forked.

Dipteryx—Calix, two upper segments winged; legume ovate, compressed, one-seeded.

Galactia—Calix four-cleft, bibracteolate; petals all oblong, the vexillum broader and incumbent; anthers oblong; stigma obsolete; stipe of the germ naked; legume terete, many-seeded.

Lespedeza—Calix five-parted, bibracteate at the base, segments subequal; carina transversely obtuse; loment lenticular, unarmed, one-seeded.

Loddigesia—Standard many times smaller than the wings or keel; filaments all in one set, with a dorsal fissure; legume stalked, turgid.

Melilotus—Flowers racemose: Calix tubulous, five-toothed; carina simple, shorter than the wings and vexillum; legume as long as the calix, rugose.—The species of this genera resemble *Trifolium* exactly in habit, but the stem is generally erect, and the flowers not capitate.

Oxytropis—Carina terminating above in a subulate appendage; legume bilocular or subbilocular, the upper suture inflexed.—Habit similar to *Astragalus*.

Platylobium, *Flat Pea*—Calix bell-shaped, five-cleft, the two upper segments very large and obtuse; legume pedicelled, compressed, winged at the back.

Sesbania—Calix five-toothed; legume elongated, bivalve, divided into many cells by transverse dissepiments.

Smithia—Legume with distinct one-seeded joints, connected by the style; stamens divided into two bodies.

Stylosanthes—Calix tubulous and very long, bearing the corolla; germ beneath the corolla; loment with one or two articulations, hooked.

Taramnus—Keel very small, concealed within the calix; stamens alternate, five barren; stigma sessile, headed; calix two-lipped.

Tephrosia—Dentures of the calix subulate, subequal; stamens monadelphous; legume compressed, subcoriaceous.

Trigonia—Calix five-parted; corolla papilionaceous; petals five, unequal; banner pitted at the base; nectary two scales at the base of the germen; filaments, some barren; capsule leguminous, three-celled, three-valved.

Zornia—Calix bell-shaped, two-lipped, the upper lip abrupt; standard revolute; keel angular; five alternate anthers oblong, five globose; legume of several single-seeded close hispid joints.

CLASS XVIII.—POLYADELPHIA.

Consisting of Plants having their Stamens united into many, or at least more than two, sets or parcels.

1. DECANDRIA *(Ten Stamens in each Set.)*

Cytisus.—See *Diadelphia Decandria*.

Theobroma, *Chocolate-nut Tree*—Calix five-leaved; petals five, arched; nectary five-horned; filaments five, within the claws of the petals, growing externally to the nectary, having two anthers on each.

2. DODECANDRIA *(Twelve to Nineteen Stamens in each Set.)*

Abroma—Pistils five; capsule five-celled, one-valved, gaping at top; seeds subovate, incompletely arilled.

Bubroma, *Bastard Cedar*—Calix three-leaved; petals five, arched, semibifid; anthers on each filament three; stigma simple; capsule muricate, ending in a five-rayed star, punched with holes, five-celled, valveless, not opening.

3. ICOSANDRIA *(Twenty Stamens in each Set.)*

Citrus, *Citron*—Calix five-cleft; petals five; stamens about twenty, polyadelphous; berry many-seeded.

Melaleuca, *Smaller Cajeput Tree*—Calix five-cleft, half superior; petals five; filaments very long, in five bodies; style one; capsule three-celled.

4. POLYANDRIA *(Many Stamens in each Set.)*

Hypericum, *St. John's-wort*—Calix five-parted; petals five; filaments many, connected at the base in five bundles.

Ascyrum, *St. Peter's-wort*—Calix four-leaved; petals four; filaments many, in four divisions.

Hopea—Calix five-cleft, superior; corolla five-petalled; stamens many, connected in five bodies; style one; drupe with a three-celled nut.

Durio—Calix five-cleft, pitcher-shaped, inferior; corolla five-petalled, small; style one; stamens in five bodies; pome five-celled.

Munchhausia—Calix six-cleft; torulose; petals clawed; stamens in six bodies, four or five in each; pistil superior, with a filiform curved style.

Glabraria.—See *Monadelphia Polyandria*.

Douglassia—Calix half-six-cleft; corolla none; nectaries six; filaments none; germen superior; stigma six-cleft; berry ovate, one-celled; seed one, with a brittle shell.

Porostema—Calix six-parted, unequal; petals none; nectary nine scales, with four anthers on each; capsule covered, four or six celled, many-seeded.

Xanthochymus, *Painter's Golden Apple*—Calix of five leaves; petals five; nectaries five, abrupt; stamens united into five sets, alternate with the nectaries; berry with from one to five seeds.

CLASS XIX.—SYNGENESIA.

Consisting of Plants whose Flowers are compound, that is, composed of a number of small Flowers, or Florets, all placed upon the same Receptacle, and within one common Calix; the Stamens being five in number, with distinct Filaments, but the Anthers, or superior part of the Stamens, united side by side, composing a hollow cylinder, through which the Style of the Pistil passes.

1. POLYGAMIA ÆQUALIS.

(In this Order, all the flowers are furnished with both stamens and pistils.

1. *Such as have ligulate compound Flowers.*

Geropogon, *Old Man's Beard*—Calix simple; receptacle with bristle-shaped chaps; seed of the disk with a feathered down, of the ray with five awns.

Tragopogon, *Goat's Beard*—Calix simple; down feathered; receptacle naked.

Scorzonera, *Viper's Grass*—Calix imbricate with scales, scariose at the edge; pappus feathered, sessile; receptacle naked.

Picris, *Oxtongue*—Calix double, the inner equal, the outer lax; receptacle naked; seed transversely grooved; down feathered.

Sonchus, *Sow Thistle*—Calix imbricate, ventricose; down hairy; receptacle naked.

Lactuca, *Lettuce*—Calix imbricate, cylindrical, with a membranaceous margin; receptacle naked; seeds even, with a simple stipulate down.

Chondrilla, *Gum Succory*—Calix calicled; floscules in many rows; seeds muricated; pappus simple, stipulated.

Prenanthes—Calix calicled; florets in a simple row; pappus simple, subsessile; receptacle naked.

Leontodon, *Dandelion*—Calix imbricate, with loosish scales; down capillary; receptacle naked, dotted.

Hieracium, *Hawkweed*—Calix imbricate, or caliculate, ovate; down simple, sessile; receptacle naked.

Crepis, *Bastard Hawkweed*—Calix calicled, with deciduous scales; down hairy, stipitate; receptacle naked.

Andryala, *Downy Sow Thistle*—Receptacle villose; calix many-parted, subequal, rounded; down simple, subsessile.

Hyoseris, *Yellow Eye*—Calix almost equal; down hairy and calicled; receptacle naked.

Seriola—Calix simple; pappus subplumose; receptacle chaffy.

Hypochœris—Calix subimbricate; down feathered; receptacle chaffy.

Lapsana, *Nipplewort*—Calix calicled, each of the inner scales channelled; receptacle naked.

Catananche—Receptacle chaffy; calix imbricate; down awned, from a five-bristled calix.

Cichorium, *Succory* or *Endive*—Calix calicled; pappus slightly five-toothed, obscurely hairy; receptacle somewhat chaffy.

Scolymus, *Golden Thistle*—Calix imbricate, spiny; pappus none; receptacle chaffy.

2. *Such as have tubulous compound Flowers.*

Arctium, *Burdock*—Calix globular, the scales furnished at the end with inflected hooks.

Serratula, *Sawwort*—Calix subcylindrical, imbricate, awnless; receptacle chaffy or hairy; seed-down feathery or toothed.

Carduus, *Thistle*—Calix ovate, imbricate with spiny scales; receptacle hairy.

Cnicus, *Blessed Thistle*—Calix ovate, imbricate with branch-thorn scales, guarded with bractes; corollets equal.

Onopordum, *Cotton Thistle*—Scales mucronate; receptacle honey-combed.

Cynara, *Artichoke*—Calix dilated at the base, imbricated with somewhat fleshy scales; receptacle more or less thick and fleshy.

Carlina, *Carline Thistle*—Calix radiated with long, coloured, marginal scales.

Carthamus, *Bastard Saffron*, or *Safflower*—Calix ovate, imbricate with scales, which at the end are subovate-foliaceous.

Bidens, *Water Hemp Agrimony*—Calix imbricate; corolla sometimes, but seldom, with a floscule or two in the ray; seed crowned with erect scabrous awns; receptacle chaffy.

Cacalia, *Alpine Colt's Foot*—Calix cylindrical, oblong, at the base only subcalicled; down capillary; receptacle naked.

Atractylis, *Distaff Thistle*—Corolla radiated; corollules of the ray five-toothed.

Eupatorium, *Hemp Agrimony*—Receptacle naked; down rough or feathery; calix imbricated, oblong; style prominent, cloven half way down, divaricated.

Ageratum, *Bastard Hemp Agrimony*—Receptacle naked; down five-awned; calix oblong, subequal; corollets quadrifid.

Ethulia—Receptacle naked; seed-down none; florets tubular, five-cleft, numerous; scales of the calix pointed.

Stæhelina—Anthers tailed; down branched; receptacle with very short chaffs.

Chrysocoma, *Goldy Locks*—Calix hemispherical, imbricate; style scarcely larger than the florets; pappus simple; receptacle naked.

Calea, *Halbert Weed*—Calix imbricate; down hairy, or none; receptacle chaffy.

Tarchonanthes, *African Fleabane*—Calix one-leafed; commonly half-seven-cleft, turbinate; seeds covered with down; receptacle villose.

Pteronia—Receptacle with many-parted bristles; down subplumose; calix imbricate.

Athanasia, *Cotton-weed*—Calix imbricate; down chaffy, very short; receptacle chaffy.

Spilanthus—Calix almost equal; down two-awned; receptacle conical, chaffy.

Santolina, *Lavender Cotton*—Calix imbricate, hemispherical; down none; receptacle chaffy.

Barnadesia—Calix naked, imbricate, pungent; corolla radiate; down of the ray feathered, of the disk bristly, broken backwards.

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Apargia—Calix subimbricate, with linear, parallel, unequal scales; down plumose, subsessile; receptacle naked, subvillose.

Artemisia, *Southernwood* and *Wormwood*—Receptacle subvilluse, or almost naked; down none; calix imbricate with rounded converging scales; corolla of the ray none.

Borkhausia—Calix caliculate, at length, in seed, sulcately-costate, exterior scales or calicle loose; receptacle naked; pappus stipitate, pilose.

Hedypnois—Calix calicled with short scales; seeds crowned with the calicle; outer without down, covered up in the scales of the calix; inner having a down of five erectish awned chaffs; receptacle naked, hollow, and dotted.

HYMENOPAPPUS—Calix many-leaved, spreading; leaflets suboval, coloured; receptacle naked; pappus paleaceous, many-leaved; segments very short and obtuse, awnless.

KRIGIA—Calix many-leaved, simple; receptacle naked; pappus double, external membranaceous, five or eight leaved, interior about five, eight, or twenty-four scabrous setæ.

KUHNIA—Flowers floscular; calix imbricated, oblong, cylindrical; down plumose; receptacle naked; style deeply bifid; stigmas club-shaped; anthers distinct.

LAVENIA—Calix nearly regular; style bifid; down three-awned, glandular at the tip; receptacle naked.

LIATRIS—Calix oblong, imbricate, awnless, coloured; down feathered, coloured; receptacle naked, hollow, dotted.

MARSHALLIA—Calix imbricate, scales sublanceolate, incumbent; receptacle paleaceous; pappus of five membranaceous, acuminate, nerveless scales.

MELANANTHERA—Calix imbricate, leaflets ovate, appressed, subequal; receptacle paleaceous, scales carinate, the lower part embracing the florets; pappus consisting of four or five unequal unarmed awns.

MIKANIA—Calix four or six leaved, equal, four or six flowered; receptacle naked; pappus pilose.

POLYPTERIS—Calix many-leaved, spreading; leaflets suboval, coloured; receptacle naked; pappus paleaceous, about twelve-leaved; leaflets rigid and cuspidate, the length of the seed.

ROTHIA—Receptacle, in the ray chaffy, in the disk villose; calix of many equal scales; seed in the ray bald, in the disk pappose.

SPARGANOPHORUS—Calix subglobose, imbricate, scales recurved at the point; receptacle naked; seed crowned with a small subcartilaginous cup.

STOKESIA—Corollets in the ray funnel-form, longer, irregular; down four-bristled; receptacle naked.

TROXIMON—Calix oblong, conic, many-leaved, leaflets unequal, imbricated; receptacle naked, puncticulate; pappus sessile, pilose.

VERONIA—Receptacle naked; calix ovate, imbricated; florets tubular, five-cleft; seed-down double, the outer chaffy, short, inner capillary.

ZACINTHA—Receptacle naked; seeds of the circumference incurved; of the centre, straight; down very short, finely feathered; outer calix membranaceous, inner with eight protuberances.

2. POLYGAMIA SUPERFLUA.

(In this Order, the florets of the centre have both stamens and pistils; those of the circumference, pistils only.)

1. *Tubulous.*

TANACETUM, *Tansy*—Calix imbricate, hemispherical; corolla, rays obsolete, trifid, sometimes wanting; seed crowned with a border; receptacle naked.

GNAPHALIUM, *Everlasting*, and *Cudweed*—Calix imbricate, with the marginal scales rounded, scariose, coloured; down feathered, or simple; receptacle naked.

XERANTHEMUM, *Everlasting Flower*—Receptacle scaly; down of taper-pointed scales; calix imbricated, its inner scales forming a coloured spreading radius.

CARPESIUM—Calix imbricate, the outer scales reflex; down none; receptacle naked.

BACCHARIS, *Ploughman's Spikenard*—Calix imbricate, cylindrical; florets, female mixed with hermaphrodites; down simple; receptacle naked.

COTULA, *May-weed*—Receptacle almost naked; down margined; corollules of the disk four-cleft; of the ray, scarcely any.

CONYZA, *Fleabane*—Calix imbricate, roundish; corolla of the ray three-cleft; down simple, naked.

2. *Radiate.*

ERIGERON—Receptacle naked; down hairy; florets of the ray linear, numerous, and very narrow.

TUSSILAGO, *Colt's-foot*—Calix scales equal, as long as the disk, somewhat membranaceous; down simple; receptacle naked.

SENECIO, *Groundsel*—Calix cylindrical, calicled with scales sphacelate at the tip; down simple; receptacle naked.

ASTER, *Starwort*—Receptacle naked; down simple; corolla, rays more than ten; calix imbricate; lower scales spreading.

SOLIDAGO, *Golden Rod*—Calix scales imbricate, closed; corollets of the ray about five; down simple; receptacle naked.

INULA, *Elecampane*, and *Fleabane*—Receptacle naked; down simple; anthers ending in two bristles at the base.

CINERARIA, *Sky-flower*—Calix simple, many-leaved, equal; pappus simple; receptacle naked.

ARNICA, *Mountain Leopard's Bane*—Receptacle naked; down simple; corollules of the ray with five filaments without anthers.

DORONICUM, *Leopard's Bane*—Calix scales in two rows, equal, longer than the disk; seeds of the ray naked, and destitute of down; down to those of the disk, simple; receptacle naked.

PERDICIUM—Corollets bilabiate; down simple; receptacle naked.

HELENIUM, *Bastard Sun-flower*—Calix simple, many-parted; corollets of the ray semi-trifid; down five-awned; receptacle naked, excepting the calicine chaffs in the ray.

BELLIS, *Daisy*—Calix hemispheric, with equal scales; seeds ovate, with no down; receptacle naked, conical.

LEYSERA—Calix scariose; down chaffy, in the disk feathery also; receptacle subpaleaceous.

TAGETES, *French*, *African*, and *Chili Marigolds*—Calix one-leafed, five-toothed, tubular; florets of the ray five, permanent; down with firm erect chaffs; receptacle naked.

PECTIS—Calix five-leaved, cylindric; florets of the ray five; down awned; receptacle naked.

CHRYSANTHEMUM, *Corn Marigold*—Calix hemispherical, imbricated, the marginal scales membranaceous; pappus margined; receptacle naked.

MATRICARIA, *Feverfew*—Calix hemispherical, imbricate, the marginal scales solid, sharpish; down none; receptacle naked.

ANACYCLUS—Calix imbricate; corollets of the ray undivided; down simple; receptacle chaffy.

ANTHEMIS, *Chamomile*—Receptacle chaffy; down none; calix hemispherical, nearly equal; floscules of the ray more than five.

ACHILLEA, *Milfoil*—Calix ovate, imbricate; florets of the ray about four; down none; receptacle chaffy.

TRIDAX—Calix imbricate, cylindrical; corollets of the ray three-parted; down many-rayed, simple; receptacle chaffy.

ZINNIA—Receptacle chaffy; seed-down of two, erect, unequal claws; calix imbricated, somewhat ovate; florets of the ray from five to ten, permanent, undivided.

VERBESINA—Calix in a double row; florets of the ray about five; pappus awned; receptacle chaffy.

SIGESBECKIA—Calix, exterior five-leaved, inner spreading; ray halved; pappus none; receptacle chaffy.

Buphthalmum, *Ox-eye*—Stigma of the hermaphrodite floscules undivided; the seeds have the sides, especially in the ray, edged; down an obscure edge; receptacle chaffy.

Eclipta—Receptacle chaffy; seed-down none; florets of the disk four-cleft.

Bellium, *Bastard Daisy*—Calix with equal leaflets; seeds conic, with a chaffy eight-leaved crown, and awned down; receptacle naked.

Amellus—Calix imbricate; corollets of the ray undivided; down simple; receptacle chaffy.

Mutisia—Calix cylindric, imbricate; corollets of the ray oval-oblong, of the disk trifid; down feathered; receptacle naked.

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Acmella—Calix simple; leaflets few; receptacle oblong, paleaceous; seeds four-sided, truncate at the summit, naked.

Actinella—Calix many-leaved, subequal, flat; rays, eight to twenty, three-toothed, wider towards the extremity; receptacle naked, hemispherical; pappus paleaceous, five to eight leaved, leaflets awned.

Boebera—Calix double, exterior many-leaved, interior eight-leaved; receptacle naked; pappus pilose.

Boltonia—Calix, common subimbricate, with linear scales; corolla radiate; germen compressed, vertical; down obscurely toothed, two-horned; receptacle honey-combed.

Brachyris—Calix cylindric-ovate, closely imbricate, scales agglutinated; radial florets about five, discal florets also about five; receptacle naked; pappus short and paleaceous, leaflets five to eight, persistent.

Dahlia—Calix double, the outer of many leaves; corolla radiant, its rays equal in number to the segments of the calix, ovate, three-toothed; receptacle chaffy; stigmas downy; seed-down none.

Donia—Calix hemispherical, imbricated, squarrose and glutinous; radial florets numerous, (thirty to thirty-five, yellow); receptacle naked, scrobiculate; pappus setaceous, deciduous.

Elichrysum—Receptacle naked; down capillary or feathery; calix imbricated, its inner scales forming a coloured spreading radius.

Heliopsis—Calix imbricated; scales subovate, lined; rays large and linear; receptacle paleaceous, conic; palæa lanceolate; seeds four-sided; pappus none.

Phæthusa—Calix subcylindrical, many-leaved, hermaphrodite, several in the disk; females, one or two in the ray; receptacle chaffy; seeds hispid, without any proper down.

Pyrethrum, *Feverfew*—Calix hemispherical, imbricate; scales partly acute, with scariose margins; receptacle naked; pappus marginal.—*Smith.*

Relhania—Calix imbricate, scariose; corollets of the ray very many; seed-down membranaceous, cylindrical, short; receptacle naked.

Starkea—Calix imbricated; receptacle hirsute; pappus simple, sessile, scabrous.

Tetragonotheca—Calix one-leafed, four-sided, four-parted, very broad; receptacle paleaceous; pappus none.

Trichophyllum—Calix oblong-cylindric, many-leaved, equal; radial florets oblong; receptacle naked; pappus paleaceous, minute, five to eight leafed; leaflets obtuse, awnless.

3. POLYGAMIA FRUSTRANEA.

(In this Order, the florets of the centre have both stamens and pistils; those of the ray neither, or only abortive pistils.)

Helianthus, *Sun-flower*—Calix imbricate, somewhat squarrose; down two-leaved; receptacle chaffy, flat.

Rudbeckia—Calix with a double row of scales; seed crowned with a four-toothed rim; receptacle chaffy, conical.

Coreopsis, *Tick-seed Sun-flower*—Calix erect, many-leaved; surrounded at the base with spreading rays; down two-horned; receptacle chaffy.

Gorteria—Calix imbricate with spiny scales; corolla of the ray ligulate; down woolly; receptacle naked.

Osmites—Calix imbricate, scariose; corolla of the ray ligulate; down obsolete; receptacle chaffy.

Zoegea—Receptacle bristly; seed-down of simple bristles; florets of the ray ligulate; calix imbricated.

Centaurea, *Centaury*, *Blue-bottle*, *&c.*—Receptacle bristly; down simple; corolla of the ray funnel-form, longer, irregular.

Sclerocarpus—Calix six-leaved, three exterior larger, like the leaves, three internally smaller, like the scales, alternate; pappus none; receptacle chaffy.

Didelta—Calix expanding, outer leafy; receptacle honey-combed, dividing into many parts, which retain the seed; down chaffy, many-leaved.

Leptopoda—Calix simple, many-parted; rays twenty or more, semitrifid, broader at the summit; receptacle naked, hemispherical; pappus paleaceous, eight to ten leaved, awnless.

Galardia—Calix many-leaved, flat, subequal; rays semitrifid and broader towards the summit; receptacle setose, hemispherical; pappus paleaceous, leaflets eight to ten, awned.

Balduina—Calix imbricated, foliaceous, and squarrose; rays subtrifid; receptacle hemispherical, corneous, cellular; seeds immersed; pappus paleaceous, awnless, erect, about ten-leaved.

Actinomeris—Calix simple, many-leaved, foliaceous, subequal; rays remote, elongated, four to eight; receptacle small and paleaceous, the leaflets embracing the margin of the seed; seed compressed and marginated, with the summit persistently two-awned.

Pallasia—Receptacle chaffy; down none; seed vertical, flat; margin ciliated; calix imbricate.

4. POLYGAMIA NECESSARIA.

(In this Order, the florets of the centre have stamens and pistils, without seeds; those of the circumference pistils only, with seeds.)

Milleria—Calix three-valved; ray of the corolla halved; down none; receptacle naked.

Silphium—Calix squarrose; seed-down margined, two-horned; receptacle chaffy; chaffs linear.

Chrysogonum—Calix five-leaved; seed involved in a four-leaved calicle; pappus one-leafed, three-toothed; receptacle chaffy.

Melampodium—Calix five-leaved; receptacle chaffy, conical; down one-leafed, involuted, converging.

Calendula, *Marigold*—Receptacle naked; down none; calix with many divisions; seeds in the circumference of the disk, membranaceous.

Arctotis—Receptacle villose or chaffy; down with a five-leaved crown; calix imbricate with scales, scariose at the end.

Osteospermum—Calix simple, or in two rows, many-leaved, almost equal; seeds globular, coloured, bony, (Gærtner says, berried, or nucamentaceous); down none; receptacle naked.

Othonna, *African Ragwort*—Calix one-leafed, multifid, subcylindrical; down almost none; receptacle naked.

Polymnia—Calix, exterior four or five leaved, interior ten-leaved, the leaflets concave; down none; receptacle chaffy.

Eriocephalus—Receptacle woolly; seed-down none; calix of ten equal leaves; florets of the radius five, inversely heart-shaped.

Filago, *Cotton* or *Cud Weed*—Receptacle cylindrical, clothed with the calix scales; seed-down none; female florets among the calix scales; hermaphrodite ones four-cleft, in the disk.

Micropus—Calix calicled; ray of the corolla none; female florets wrapped up in the calicine scales; down none; receptacle chaffy.

Baltimora—Calix cylindric, many-leaved; ray of the corolla five-flowered; down none; receptacle chaffy.

Hippia, *Shrubby Tansey*—Calix hemispherical, subimbricate; corollets of the ray ten, obsolete, subtrifid; seeds with a broad margin, naked; down none; receptacle naked.

Ambrosia.—See *Monœcia Pentandria.*

Chaptalia—Calix subimbricated, many-leaved; feminine florets of two kinds, in two series, external radiate, internal naked; discal florets bilabiate; receptacle naked; pappus capillary.

Gymnostyles—Calix many-leaved, the leaflets disposed in a single order; feminine florets apetalous; seeds compressed, partly toothed at the summit, awned with the persistent style.

Parthenium—Calix five-leaved; rays very small; receptacle paleaceous, minute; exterior scales dilated; seed obovate, minutely three-awned.

Trixis—Corollets of the ray trifid; seeds hairy at the tip, without any down; receptacle chaffy.

Unxia, *Balsam Weed*—Calix five-leaved, leaflets ovate; florets of both disk and ray five; seed-down none; receptacle naked, flat.

Wedelia—Receptacle chaffy; seed-crown of from five to ten teeth; calix simple, of four or five leaves.

5. POLYGAMIA SEGREGATA.

(In this Order, the florets are enclosed within one common calix; each having, besides, a separate cup of its own; the whole forming one compound flower.)

Elephantopus, *Elephant's Foot*—Partial calix with four or five tubular florets, all perfect; receptacle naked; down bristle-shaped.

Œdera—Calices many-flowered; corollets tubular; hermaphrodite with one or two female ligulate florets; receptacle chaffy; down of several chaffs.

Spæranthus, *Globe Flower*—Calix eight-flowered; corolla tubular, hermaphrodite, and indistinctly female; receptacle scaly; seed one, oblong.

Echinops, *Globe Thistle*—Calix one-flowered; corolla tubular, hermaphrodite; receptacle bristly; down obscure.

Gundelia—Calix scarcely any, five-flowered; corolla tubular, male, and hermaphrodite; receptacle chaffy; down none.

Stoebe—Calix one-flowered; corolla tubular, hermaphrodite; receptacle naked; down feathered.

Jungia—Calix, common three-flowered; receptacles chaffy; florets tubular, two-lipped; outer lip ligulate, inner two-parted.

Craspedia—Calicle none; calix imbricate; florets in depressed bundles, all hermaphrodite, tubular; down feathery; receptacle chaffy.

Enydra—Common calix of four leaves; partial, of one leaf rolled up into a tube, single-flowered; corollets all tubular, those of the radius three-cleft; receptacle naked; down none.

Rolandra—Common calix none; perianth two-valved, single-flowered; florets hermaphrodite; seed with a toothed crown.

Seriphium—Calix double, imbricate; corolla one-petalled, regular; seed one, oblong, below the corolla.

Shawia—Calix imbricate, with five or six scales, three interior larger; corolla tubular, five-cleft; seed one, oblong.

Tetranthus—Calix, common four-flowered; perianth proper one-leafed; seed one, crowned.

6. MONOGAMIA.

(This Order consists of such plants as have their anthers combined, the flowers being simple.—The order is now generally abolished, and the plants which compose it, are removed to the class *Pentandria*, order *Monogynia.*)

Strumfia—Calix five-toothed, superior; corolla five-petalled; berry one-seeded.

Corymbium—Calix two-leaved, one-flowered, prismatic; corolla one-petalled, regular; seed one, below the corolla, woolly.

Jasione, *Sheep's Scabious*—Calix, common ten-leafed; corolla five-petalled, regular; capsule inferior, two-celled.

Lobelia, *Cardinal Flower*—Calix five-cleft; corolla one-petalled, irregular; capsule inferior, two or three celled.

Impatiens, *Balsam*—Calix two-leaved; corolla five-petalled, irregular, with a cowled nectary; capsule superior, five-valved.

Barreria—Calix five-toothed, very small; corolla five-parted; style short; stigma trifid.

CLASS XX.—GYNANDRIA.

Consisting of Plants whose Stamens grow upon the Pistil itself, either on the Style or Germen; and the Orders depend upon their number.

1. MONANDRIA *(One Stamen.)*

Epidendrum, *Vanilla*—Calix leaves spreading; lip tubular at the base, attached to the forepart of the style, destitute of a spur; anther a terminal lid, deciduous.

Listera, *Tway-blade*—Calix spreading; nectary without a spur, not embraced by the calix; petals spreading; column without a border.

Epipactis—Calix leaves direct, slightly spreading; lip without a spur; anther a terminal permanent lip; pollen powdery, granulated.

Aceras, *Man-Orchis*—Calix converging; nectary plane, without a spur.

2. DIANDRIA *(Two Stamens.)*

Orchis, *Butterfly Flower*—Nectary a horn or spur behind the flower,

Satyrium, *Lizard Flower*—Nectary scrotiform, or twin, inflated behind the flower.

Ophrys, *Ladies' Traces, &c.*—Nectary somewhat keeled underneath.

Serapias, *Heleborine*—Nectary ovate, gibbous, with an ovate lip.

LIMODORUM, *Bastard Hellebore*—Nectary one-leafed, concave, pedicelled, within the lowest petal.
ARETHUSA—Nectary tubular, within the bottom of the corolla, the lower lip fastened to the style.
CYPRIPEDIUM, *Ladies' Slipper*—Nectary ventricose, inflated, hollow.
GUNNERA—Ament with one-flowered scales; calix and corolla none; germen two-toothed; styles two; seed one.
FORSTERA—Calix double; inferior of two or three leaves; superior of three to six leaves; corolla tubular, bell-shaped, in five or six segments; capsule of one cell; seeds numerous.
DISA—Spathe one-valved; petals three, the third less, two-parted, gibbous at the base.
CRANICHIS—Nectary galeated.

3. TRIANDRIA *(Three Stamens.)*

SALACIA—Monogynous, or one-styled: Calix five-parted; corolla five-petalled; anthers placed on the apex of the germen; style very short; stigma simple.
STILAGO—Calix one-leafed, pitcher-shaped; corolla none. Female: stigma sessile; drupe with a two-celled nut.

4. PENTANDRIA *(Five Stamens.)*

PASSIFLORA, *Passion Flower*—Calix in five deep segments; petals five, inserted into the calix; nectary a complete radiating crown; berry stalked; seeds with a pulpy tunic.
AYENIA—Monogynous: Calix five-leaved; petals united into a star, with long claws; anthers five under the stars; capsule five-celled.

5. HEXANDRIA *(Six Stamens.)*

ARISTOLOCHIA, *Birthwort*—Stigmas six; calix none; corolla monopetalous, tongue-shaped, entire; capsule six-celled, inferior.

6. OCTANDRIA *(Eight Stamens.)*

CYTINUS—Style one; calix superior, four-cleft; corolla none; anthers eight; berry eight-celled; seeds many.

7. DECANDRIA *(Ten Stamens.)*

HELICTERES, *Screw Tree*—Pentagynous: Calix one-leafed, oblique; petals five; nectary of five leaflets; capsules five, twisted.
KLEINHOVIA.—See *Dodecandria Monogynia.*

8. POLYANDRIA *(Many Stamens.)*

GREWIA—Calix five-leaved, coloured within; petals five, with a nectareous scale at the base of each; berry four-celled.
ARUM, *Wake Robin*—Spathe one-leafed, cowled; spadix naked above; female below, stamenous in the middle.
DRACONTIUM, *Dragons*—Spathe boat-form; spadix covered; calix none; petals five; berries many-seeded.
AMBROSINIA—Spathe one-leafed, separated by a partition; stamens on the inner, pistil on the outer side of it.
ZOSTERA.—See *Monandria Monogynia.*
CALLA—Spathe flat; spadix covered with floscules; calix and petals none; berries many-seeded.

CLASS XXI.—MONŒCIA.

Consisting of such Plants as have barren, or Male Flowers, on the same individual, with fertile, or Female ones; whereas in the twenty-second Class such flowers grow upon distinct individuals of the same species.

1. MONANDRIA *(Male Flowers with One Stamen.)*

ZANNICHELLIA, *Horned Pondweed*—Male: calix none; corolla none; filaments elongated, erect; anther oblong. Female: calix of one leaf; corolla none; germens four, or more; stigmas peltate; seeds stalked, naked.
CERATOCARPUS—Male: calix one-leafed, bifid; corolla none. Female: calix one-leafed, keeled, permanent, two-horned; styles two; seeds single, compressed, enclosed in and covered by the calix.
CYNOMORIUM—Male: calix an imbricated ament; corolla none. Female: calix in the same ament; corolla none; style one; seed one, roundish.
ELATERIUM, *Spring Gourd*—Male: calix none; corolla salver-shaped. Female: calix none; corolla salver-shaped; capsule inferior, prickly, elastic, of one cell, and two unequal valves; seeds numerous, imbedded in pulp.
CHARA, *Stonewort*—Male: calix and corolla none; anthers before the germen, underneath. Female: calix four-leaved; corolla none; stigma five-cleft; seed one.
ÆGOPRICON—Male: an ament; calix, common trifid, partial tubulous; anther four-lobed. Female flowers solitary; calix as in the male; corolla none; styles three, coadunate at the base; capsule tricoccous.
ARTOCARPUS, *Bread-fruit Tree*—Male: an ament; calix none; corolla two-petalled. Female: calix and corolla none; style one; berries one-seeded, connected, and forming a roundish muricated fruit.
CASUARINA—Male: calix of the ament; corolla scalelets two-parted. Female: calix of the ament; corolla none; style bifid, strobile.
CAULINIA—Calix and corolla none; anther sessile; style filiform; stigma bifid; capsule one-seeded.
HOUTTUYNIA—Calix four-leaved; corolla none; stamens mixed with the pistils, seven about each germen.
NAJAS—Male: calix cylindric, bifid; corolla four-cleft; filament one. Female: calix and corolla none; stigmas two or three, undivided; capsule ovate, one-celled.
ZANNICHELLIA—Male: calix and corolla none. Female: calix one-leafed; corolla none; germs and seeds about four.

2. DIANDRIA *(Male Flowers with Two Stamens.)*

LEMNA, *Duck's Meat*—Male: calix one-leafed; corolla none. Female: calix one-leafed; corolla none; style one; capsule one-celled.
ANGURIA—Male: calix five-cleft; corolla five-petalled. Female: calix and corolla as in the male; pome inferior, two-celled, many-seeded.
PODOSTEMUM—Calix and corolla none; stamens two, affixed to a common pedicel; germ ovate; stigma one, sessile; capsule two-celled, two-valved, many-seeded; seeds minute.

3. TRIANDRIA *(Male Flowers with Three Stamens.)*

TYPHA, *Cat's-tail*, or *Reed Mace*—Male: ament cylindrical; calix indistinct, three-leaved; corolla none. Female:

ament cylindrical, below the males; calix a villose hair; corolla none; seed one, placed on a capillary down.

SPARGONIUM, *Bur Reed*—Male and Female: ament roundish; calix three-leaved; corolla none. Female: stigma bifid; drupe juiceless, one-seeded.

ZEA, *Maize* or *Indian Corn*—Male flowers in distinct spikes; calix a two-flowered beardless glume; corolla beardless. Female: calix a glume of two valves; corolla of four valves; style one, thread-shaped, pendulous; seeds solitary, imbedded in an oblong receptacle.

COIX, *Job's Tears*—Males in remote spikes; calix glume two-flowered, awnless; corolla glume awnless; style two-parted; seed covered by the calix, ossified.

TRIPSACUM—Male: calix glume two-flowered; corolla valves membranaceous. Female: calix glume with perforated sinuses; corolla two-valved; stigmas two; seed one.

OLYRA—Male: calix glume one-flowered, awned; corolla glume awnless, (Swartz says, no corolla.) Female: calix glume one-flowered, spreading, ovate; style bifid; seed cartilaginous.

CAREX, *Sedge*—Ament imbricate; calix one-leafed; corolla none. Female: nectary inflated, three-toothed; stigmas three; seed three-sided, within the nectary.

AXYRIS—Male: calix three-parted; corolla none. Female: calix two-leaved; corolla none; styles two; seed one.

TRAGIA—Male: calix three-parted; corolla none. Female: calix five-parted; corolla none; stigma trifid; capsule tricoccous, three-celled; seeds solitary.

HERNANDIA, *Jack-in-a-Box*—Male: calix deeply three-cleft; corolla of three petals. Female: calix truncated, entire; corolla of six petals; drupe hollow, open at the mouth, its coat unconnected with the nut.

COMPTONIA—Male: ament cylindric; calix two-leaved; corolla none; anthers two-parted. Female: ament ovate; calix six-leaved; corolla none; styles two; nut oval.

ERIOCAULON.—See *Triandria Trigynia*.

KOBRESIA—Male: calix, the inner scales of an imbricated catkin, solitary; corolla none. Female: calix, the outer scales of the same catkin, sheathing, permanent; corolla none; stigmas three; seed triangular, naked.

SCLERIA—Male: calix glume from two to six valved, many-flowered, awnless; corolla glumes awnless; filaments one to three. Female: calix from two to six valved, one-flowered, awnless; stigmas one to three; seed, nut subglobular, somewhat bony, coloured.

4. TETRANDRIA *(Male Flowers with Four Stamens.)*

BETULA, *Birch Tree*—Male: calix one-leafed, three-cleft, three-flowered; corolla four-parted. Female: calix one-leafed, subtrifid, two-flowered; seed with a winged membrane on each side.

BUXUS, *Box Tree*—Male: calix three-leaved; petals two; the rudiment of a germen. Female: calix four-leaved; petals three; styles three; capsule three-beaked, three-celled; seeds two.

URTICA, *Nettle*—Male: calix four-leaved; corolla none; nectary rudiment of a germen, central, cup-shaped. Female: calix two-leaved; corolla none; seed one, superior, shining.

MORUS, *Mulberry Tree*—Male: calix four-parted; corolla none. Female: calix four-leaved; corolla none; styles two; calix becoming a berry; seed one.

CICCA—Male: calix four-leaved. Female: calix three-leaved; styles four; capsule tetracoccous.

SERPICULA—Male: calix four-toothed; petals four. Female: calix in four deep segments; nut tomentose.

LITTORELLA, *Plantain Shoreweed*—Male: calix four-leaved; corolla four-cleft; stamens long. Female: calix none; corolla slightly four-cleft; styles long; seed a nut.

ACUBA—Male: calix four-toothed; corolla four-petalled; berry one-seeded. Female: nut one-celled.

ALNUS.—See *Betula*.

ARGYTHAMNIA—Male: calix four-leaved; corolla four-petalled. Female: calix five-leaved; corolla none; styles dichotomous; capsule tricoccous, with solitary seeds.

BOEHMERIA—Male: calix four-parted; corolla none. Female: calix none, but crowded scales between each germen, obovate; style single; seed single, compressed.

DIOTIS—Male: calix four-leaved; corolla none. Female: calix one-leafed, two-horned; style biparted; seed one, villose, covered by the two-horned calix.

EMPLEURUM—Male: calix four-cleft; corolla none; sometimes with the rudiment of a germen. Female: calix four-cleft, inferior; corolla none; stigma cylindrical, standing on a lateral tooth of the germen; capsule beaked, two-valved; seed solitary, with an elastic aril.

PACHYSANDRA—Calix about four-leaved; corolla none; filaments subclavate; styles three; capsules three-horned, three-celled; cells two-seeded.

TRICERA—Male: calix four-parted; corolla none; stamens fleshy; filaments ovate. Female: calix five-leaved; corolla none; styles conical; capsule three-horned, three-celled, three-valved.

5. PENTANDRIA *(Male Flowers with Five Stamens.)*

XANTHIUM, *Burweed*—Male: common calix imbricated; florets of one petal, funnel-shaped, five-cleft; receptacle chaffy. Female: calix two-leaved, two-flowered; corolla none; drupe dry, muricated, cloven; nut of two cells.

AMBROSIA—Male: calix, common one-leafed; corolla one-petalled, trifid, funnel-shaped; receptacle naked. Female: calix one-leafed, entire, the belly five-toothed, one-flowered; corolla none; nut of the hardened calix, one-seeded.

PARTHENIUM, *Bastard Feverfew*—Male: calix, common five-leaved; corolla of the disk one-petalled. Female: corolla of the ray five, on each side two males, with one female between, superior.

IVA—Male: calix, common three or four leaved; corolla of the disk one-petalled, five-cleft; receptacle with hairs or linear chaffs. Female: in the ray, five, or fewer; corolla none; styles two, long; seeds naked, blunt.

AMARANTHUS, *Amaranth*—Male: calix three or five leaved; corolla none; stamens three or five. Female: calix three or five leaved; corolla none; styles three; capsule one-celled, opening horizontally; seed one.

NEPHELIUM—Male: calix five-toothed; corolla none. Female: calix four-cleft; corolla none; germens two, with two styles to each drupe; or, as Gærtner says, capsules two, muricated, one-seeded.

CLIBADIUM—Male: common calix imbricated; anthers of the male florets approximating, not united. Female: common calix the same; corolla of the ray, female, three or four; drupe umbilicated.

BRYONIA, *Briony*—Calix five-toothed; corolla five-parted. Male: filaments three. Female: styles quadrifid; berry subglobular, many-seeded.

CROTONOPSIS—Male: calix five-parted; corolla of five petals. Female: calix five-parted; corolla none; stigmas three, twice bifid; capsule one-seeded.

FRANSERIA—Male: common calix of one leaf, with many teeth; corolla monopetalous, tubular, with five teeth;

receptacle naked. Female: calix of many leaves, single-flowered; corolla none; styles four; drupe dry, bristly, of four cells.

SCHISANDRA—Calix nine-leaved, disposed in three series; corolla none; anthers subsessile, covering at the points; berry single-seeded, inserted upon an elongated filiform receptacle.

6. HEXANDRIA *(Male Flowers with Six Stamens.)*

ZIZANIA, *Wild Rice*—Male: calix none; corolla of two unequal closed valves, the outermost largest, revolute at the edges, with a terminal awn; styles two, divaricated; seed solitary, enclosed in the plaited corolla, but unconnected with it.

PHARUS, *Wild Jamaica Oat*—Calix glume two-valved, one-flowered. Male: corolla glume two-valved. Female: corolla glume one-valved, long, involving; seed one.

BACTRIS—Male: calix three-parted; corolla one-petalled, three-cleft; stamens six. Female: calix one-leafed, three-toothed; stigma obscurely three-cleft; drupe coriaceous.

COCCOS—Male: calix three-parted; corolla three-petalled; stigmas three; drupe coriaceous.

ELATE—Common spathe of two valves; common spadix branched. Male: calix three-toothed; petals three; anthers sessile. Female: calix three-toothed; petals three; stigmas three; drupe with one nut.

EPIBATERIUM—Male: calix double, the outer of six, the inner of three leaves; petals six, in two series; stamens six. Female: calix and corolla as in the male; styles three; drupes three, globular, pointed; nuts solitary, kidney-shaped.

GUETTARDA—Calix superior, cylindrical, slightly toothed; corolla of one petal, funnel-shaped; anthers in the mouth of the tube; drupe dry; nut with several seeds.—*Schreber.*

POMETIA—Calix one-leafed, six-cleft; petals six. Male: stamens six. Female: berry globular, with one seed in the centre.

7. ENNEANDRIA *(Male Flowers with Nine Stamens.)*

ARECA, *Cabbage Tree*—Corolla three-petalled. Male: nine stamens. Female: a drupe, with an imbricate calix.

8. POLYANDRIA *(Male Flowers with many Stamens.)*

CERATOPHYLLUM, *Hornwort*—Male: calix many-parted; corolla none; stamens sixteen to twenty. Female: calix many-parted; corolla none; pistil one; style none; seed one, naked.

THELYGONUM, *Dog's Mercury*—Male: calix bifid; corolla none; stamens commonly twelve. Female: calix lateral, two-leaved; corolla none; style one; capsule coriaceous, one-celled, one-seeded.

JUGLANS, *Walnut Tree*—Male: calix one-leafed, scale-form; corolla six-parted; filaments eighteen. Female: calix four-cleft, superior; corolla four-parted; styles two; drupe with a grooved nucleus.

FAGUS, *Chestnut* and *Beech Trees*—Male: calix bell-shaped, five-cleft; corolla none; stamens five to twenty. Female: calix four-cleft; corolla none; styles in three or six deep divisions; nuts two or three; invested with the leathery prickly calix.

CARPINUS, *Hornbeam*—Calix one-leafed, with a ciliate scar; corolla none. Male: stamens twenty. Female: germens two, with two styles on each; nut ovate.

CORYLUS, *Hazel-nut Tree*—Male: calix one-leafed, three-cleft, scale-form, one-flowered; corolla none; stamens eight. Female: calix two-leaved, lacerated; styles two; nut ovate.

QUERCUS, *Cork* and *Oak Trees*—Calix commonly five-cleft; corolla none; stamens five to ten. Female: calix one-leafed, quite entire, rugged; corolla none; style one; stigmas two to five; seed one, ovate.

MYRIOPHYLLUM, *Water Milfoil*—Calix four-leaved; corolla none, (or, according to Gærtner, two-petalled.) Male: stamens eight. Female: pistils four; style none; seeds four, naked; (Gærtner says, stigmas two or four, sessile; nuts two or four, corticated.

PLATANUS, *Plane Tree*—Male: calix, ament globular; corolla scarcely apparent; anthers growing round the filament. Female: calix, ament globular; corolla many-petalled; stigma recurved; seeds roundish, mucronate with the style, pappose at the base.

LIQUIDAMBER, *Sweet Gum*—Male: calix, common four-leaved; corolla none; filaments numerous. Female: calix in a globe, four-leaved; corolla none; styles two; capsules many in a globe, two-valved, many-seeded.

POTERIUM, *Burnet*—Male: calix four-leaved; corolla four-parted; stamens thirty to forty. Female: calix four-leaved; corolla wheel-shaped, four-parted; pistils two; berry formed of the hardened tube of the corolla.

SAGITTARIA, *Arrowhead*—Male: calix three-leaved; corolla three-petalled; filaments commonly twenty-four. Female: calix three-leaved; petals three; pistils many; capsules numerous, inflated, single-seeded.

BEGONIA—Male: calix none; corolla many-petalled; stamens numerous. Female: calix none; corolla many-petalled, superior; capsule winged, many-seeded.

ACIDOTON—Male: calix five-leaved; corolla none; stamens fixed to a globular receptacle. Female: calix six-leaved; corolla none; style trifid; capsule three-grained.

CALADIUM—Anthers peltate, many-celled, collected into a spike at the summit of the spadix; germs inserted at the base of the spadix; style none; stigma umbilicate; berry one-celled, many-seeded.

CARYA, *Hickory*—Male: ament imbricated; calix, three-parted scales; corolla none; stamens four to six. Female: calix four-cleft, superior; corolla none; styles none; stigma partly discoid, four-lobed; pericarp four-valved; nut subquadrangular, even.—(A species of *Juglans.*)

CARYOTA—Male: calix common; corolla tripartite; stamens very many. Female: calix as in the male; corolla tripartite; pistil one; berry dispermous.

HEDYOSMUM—Male: ament covered with anthers; no perianth, corolla, or filaments. Female: calix three-toothed; corolla none; style one, three-cornered; berry three-cornered, one-seeded.

MABEA—Male: calix one-leafed, five-toothed; corolla none; filaments nine to twelve, inserted into the bottom of the calix. Female: stigmas three, revolute; capsule covered with a thick bark, three-celled, three-seeded.

OSTRYA, *Hop Hornbeam Tree*—Ament imbricated. Male: calix consisting of scales; filament of the stamens ramose. Female: ament naked; capsules inflated, imbricated at the base, one-seeded.

PARIANA—Male flowers in whorls, forming spikes; calix two-valved; corolla two-valved, larger than the calix; filaments forty. Female: flowers solitary, in each whorl; calix two-valved; corolla two-valved, less than the calix; stigmas two; seeds three-cornered, enclosed.

SALISBURNIA—Male: aments naked; anthers incumbent,

deltoid. Female: solitary; calix four-cleft; drupe with a triangular shell.

THOA—Calix and corolla none. Male: stamens numerous, at the joints of the spike. Female: germens two, at the base of the male spike, one on each side, sessile; stigma three or four cleft, covered with a bristly web.

9. MONADELPHIA *(The Male Flowers with One Set of united Stamens.)*

HURA, *Sandbox Tree*—Male: ament imbricated; perianth truncated; corolla none; filaments cylindrical, peltate at the tip, surrounded by many anthers in pairs. Female: calix and corolla none; style funnel-form; stigma twelve-cleft; capsule twelve-celled; seed one.

PINUS, *Pine, Larch,* and *Fir Trees*—Male: calix four-leaved; corolla none; stamens very many, with naked anthers. Female: strobile with a two-flowered scale; corolla none; pistil one; seeds two, winged at the base of each scale.

CUPRESSUS, *Cypress*—Male: catkin imbricate; calix a scale; corolla none; anthers two or four, sessile, without filaments. Female: catkin strobilaceous; calix a scale; corolla none; stigma one or two concave points; nut angular.

THUJA, *Arbor Vitæ*—Male: calix, scale of an ament; corolla none; stamens four. Female: calix of a strobile, with a two-flowered scale; corolla none; seed one, girt with a membranaceous wing.

TRICHOSANTHES, *Snake Gourd*—Calix five-toothed; corolla five-parted, ciliate. Male: filaments three. Female: style trifid; pome oblong.

MOMORDICA, *Male Balsam Apple*—Calix five-cleft; corolla five-parted. Male: filaments three, bifid; capsule three-celled; seed one.

ACALYPHA—Male: calix three or four leaved; no corolla; from eight to sixteen stamens. Female: calix three-leaved; no corolla; styles three; capsule three-grained, three-celled; seed one.

DALECHAMPIA—Outer common involucre with four leaflets, inner with two trifid leaves. Male: umbellule ten-flowered; involucre two-leaved, with numerous chaffs; proper perianth five-leaved; corolla none; filaments very numerous, connate. Female: floscules three; involucel three-leaved, proper perianth with eleven leaflets; corolla none; style filiform; capsule tricoccous.

PLUKENETIA—Male: calix in four deep segments; corolla none; stamens numerous. Female: calix and corolla as in the male; germen superior; style simple; stigmas four, capitate; capsule four-lobed; cells elastic, with solitary seeds.

CROTON, *Tallow Tree*—Male: calix cylindric, five-toothed; corolla five-petalled; stamens ten to fifteen. Female: calix many-leaved; corolla none; styles three, bifid; capsule three-celled; seed one.

RICINUS, *Palma Christi,* or *Castor-Oil Plant*—Male: calix five-parted; corolla none; stamens numerous. Female: calix three-cleft; corolla none; styles three, bifid; capsule three-celled; seed one.

JATROPHA, *Physic Nut*—Male: calix none; corolla one-petalled, funnel-form; stamens ten, alternately longer and shorter. Female: calix none; corolla five-petalled, spreading; styles three, bifid; capsule three-celled; seed one.

HIPPOMANE, *Manchineel*—Male: an ament; perianth bifid; corolla none. Female: perianth trifid; corolla none; stigma three-parted; drupe, or capsule, three-grained.

STILLINGIA—Male: calix hemispherical, many-flowered; corolla tubular, erose. Female: calix one-flowered, inferior; corolla tubular, superior; style trifid; capsule tricoccous.

GNETUM—Male: an ament with scales; corolla none; filament one, with two anthers. Female: an ament with scales; corolla none; style with a bifid stigma; drupe with one seed.

CUCUMIS, *Cucumber*—Calix five-toothed; corolla five-parted. Male: filaments three. Female: pistil three-cleft; pome with acute seeds.

CUCURBITA, *Gourd*—Calix five-toothed; corolla five-cleft. Male: filaments three. Female: pistil five-cleft; seeds of the pome with a swelling margin.

SICYOS, *Single-seeded Cucumber*—Male: calix five-toothed; corolla five-parted; filaments three. Female: calix superior, five-toothed; corolla five-parted; style trifid; berry one-seeded.—*Willdenow.*

AGYNEIA—Calix six-leaved; corolla none. Male: three anthers growing to the rudiment of a style. Female: germ perforated at top; without style or stigma.

ALEURITES—The Essential Character not determined. There is but one species.

BRADLEJA—Male: calix none; corolla, petals six, nearly equal; filaments three, with three twin anthers. Female: calix none; corolla six-parted, three parts interior; germen superior, with six to eight stigmas; capsule six-celled, six-valved; seed solitary.

GYMNANTHES—Male: ament naked; perianth and corolla none; stamens, pedicels three-parted or three-forked, anther-bearing. Female: ament or germen pedicelled; corolla none; style trifid; capsule tricoccous, three-celled.

NIPA—Male: spathe; corolla six-petalled. Female: spathe; corolla none; drupes angular.

OMPHALEA—Male: calix four-leaved; corolla none; filaments columnar, with the anthers inserted into it. Female: calix five-leaved; corolla none; stigma trifid; capsule fleshy, three-celled; nuts solitary.

PHYLLANTHUS—Male: calix six-parted, bell-shaped; corolla none. Female: calix six-parted; petals none; styles three, bifid; capsule three-celled; seeds solitary.

SECHIUM, *Choco Vine*—Male: calix half-five-cleft; corolla five-cleft, with ten hollows in the upper part of the tube; filaments five, connected. Female: stigma very large, peltate, reflexed, five-cleft; pericarp large, ovate-turbinate; one-seeded.

SIPHONIA, *Elastic Gum Tree*—Calix one-leafed, bell-shaped, five-cleft; corolla none. Male: anthers five, growing below the top of the column. Female: style one; stigmas three; capsule tricoccous; seed one, sometimes two or three.

XYLOPHYLLA, *Sea-side Laurel*—Male: calix in six deep segments, three of them interior; petals none; nectary of six globose glands. Female: calix and nectary like the male; styles three; stigmas three-cleft; capsule of three cells, with six elastic valves; seeds two in each cell.

10. GYNANDRIA.

(Such plants as have the male flowers furnished with stamens that grow out of a kind of style, or imperfect pistil, the perfect one being in the female flower.)

ANDRACHNE, *Bastard Orpine*—Male: calix five-leaved; corolla five-petalled; stamens five, inserted into the rudiment of the style. Female: calix five-leaved; corolla none; styles three; capsule three-celled; seeds two.

HYPHYDRA—Male: calix one-leafed, three-parted; corolla none; stamens six, inserted above the germen. Female: calix and corolla none; style triangular, with three stigmas; capsule one-celled, three-valved; seed single.

CLASS XXII.—DIŒCIA.

Consisting of such Plants as have barren, or Male Flowers, on one individual, and fertile, or Female ones, on another of the same species.

1. MONANDRIA *(Male Flowers with One Stamen.)*

PANDANUS, *Screw Pine*—Calix and corolla none. Male: anthers sessile; inserted into the ramifications of the spadix. Female: stigmas two; fruit compound.

ASARINA—Calix, ament filiform; corolla none. Male: anthers worm-shaped. Female: style none; stigma three-lobed.

BROSIMUM—Male: ament globular, covered all round with orbiculate peltate scales. Female: ament as in the male; corolla none; style bifid; berry one-seeded.

PHYLLACHNE—Male: calix three-leaved, superior; corolla funnel-form. Female: stigma four-cornered; capsule inferior, many-seeded.

2. DIANDRIA *(Male Flowers with Two Stamens.)*

VALLISNERIA—Male: spathe two-parted; spadix covered with flowers; corolla three-parted. Female: spathe bifid, one-flowered; perianth three-parted, superior; corolla in three deep linear segments; stigma three-parted; capsule one-celled, many-seeded.

SALIX, *Willow*—Male: calix, ament composed of scales; corolla none; nectary a melliferous gland. Female: style bifid; capsule one-celled, two-valved; seed downy.

CECROPIA, *Trumpet Tree*, or *Snake-wood*—Male: spathe caducous; ament imbricate with turbinate scales, compressed, quadrangular; corolla none. Female: as in the male; germen imbricate; style one; stigma lacerated; berry one-seeded.

FRAXINUS, *Ash.*—See *Polygamia Diœcia.*

BORYA—Male: calix four-leaved; corolla none; stamens two or three. Female: stigma capitate; berry one-seeded.

CERATIOLA—Calix gemmaceous, imbricated; scales six to eight; corolla none; stamens two, exserted; stigmas unequal, four to six, two larger; berry two-seeded; seeds osseous.

CORIARIA—Calix six-leaved; corolla five-petalled, very like the calix. Male: anthers two-parted. Female: styles five; seeds covered with succulent berried petals.

3. TRIANDRIA *(Male Flowers with Three Stamens.)*

EMPETRUM, *Crow Berries*—Calix deeply three-cleft; petals three; stamens capillary, from three to nine. Female: calix deeply three-cleft; petals three; stigmas nine; berry superior, with three to nine seeds.

OSYRIS, *Poet's Cassia*—Male: calix trifid; corolla none. Female: stigma roundish; drupe one-celled.

CATURUS—Essential Character not determined. There are but two species, natives of the East Indies.

EXCŒCARIA—Male: catkin naked; perianth none; corolla none. Female: as in the male; styles three; capsule three-lobed; seeds solitary.

RESTIO—Male: ament imbricated; perianth four or six leaved, shorter than the scales; corolla none; anthers peltate. Female: ament and perianth as in the male; stigmas two or three; capsule of two or three lobes, and as many cells, bursting at the angles; seeds solitary.

MABA—Male: calix trifid. Female: corolla trifid; drupe superior, two-celled.

BATIS—Male: ament fourfold, imbricate; calix and corolla none. Female: ament ovate; involucre two-leaved; calix and corolla none; stigma two-lobed, sessile; berries conjoined, four-seeded.

ELEGIA—Male: catkin compound; florets stalked; perianth of six unequal leaves; corolla none. Female: catkin compound; perianth of six leaves; capsule of three cells.

PHŒNIX, *Date Plum Tree*—Calix three-parted; corolla three-petalled. Male: stamens three. Female: pistil one; drupe ovate.

RUSCUS, *Butcher's Broom*—Male: calix of six leaves; petals none; nectary ovate, tubular, bearing the stamens on its margin within. Female: calix and nectary as in the male; stamens none; style one; berry superior, of three cells, the seeds originally two in each cell.

WILLDENOVIA—Male: calix of many imbricated glumes; corolla of six petals, permanent. Female: calix and corolla as in the male; style one; stigmas two or three; drupe with one seed.

4. TETRANDRIA *(Male Flowers with Four Stamens.)*

VISCUM, *Misseltoe*—Male: calix four-parted; corolla none; filaments none; anthers fastened to the calix. Female: calix four-leaved, superior; corolla none; style none; berry one-seeded; seed cordate.

HIPPOPHÆ, *Sea Buckthorn*—Male: calix two-parted; corolla none. Female: calix tubular, cloven; corolla none; style one; berry one-seeded.

MYRICA, *Candleberry Myrtle*—Ament with a crescent-shaped scale; corolla none. Female: styles two; berry one-seeded.

TROPHIS, *Ramoon Tree*—Male: calix none; corolla four-petalled. Female: calix one-leafed; corolla none; stigmas two, awl-shaped; berry one to four seeded.

MONTINIA—Male: calix four-toothed, superior; petals four. Female: filaments barren; style trifid; capsule oblong, two-celled.

BRUCEA—Calix four-leaved; corolla four-petalled. Female: pericarps four, one-seeded.

SCHÆFFERIA—Male: calix four or five leaved; corolla four-petalled, or none. Female: calix four or five parted; corolla four-parted, or none; berry two-celled; seeds solitary.

5. PENTANDRIA *(Male Flowers with Five Stamens.)*

PISTACIA, *Pistachia-nut, Cyprus, Turpentine,* and *Mastich Trees*—Male: an ament; calix five-cleft; corolla none. Female: distinct; calix trifid; corolla none; styles two; drupe one-seeded.

XANTHOXYLUM, *Yellow Wood*—Male: calix in three or five small deep segments; petals three or five. Female: calix like the male, inferior, permanent; petals three or five; capsules from one to five, of two valves and one cell; seeds solitary, pendulous.

ASTRONIUM—Male: calix five-leaved; corolla five-petalled; styles three; seed one.

IRESINE—Calix two-leaved; corolla five-petalled. Male: nectaries seven. Female: stigmas two, sessile; capsule with tomentose seeds.

ANTIDESMA—Male: calix four-leaved; corolla none; anthers semi-bifid. Female: calix five-leaved; corolla none; stigmas five; berry cylindric, one-seeded.

SPINACIA, *Spinage*—Male: calix five-parted; corolla none. Female: calix four-cleft; corolla none; styles four; seeds solitary, within the hardened calix.

ACNIDA, *Virginian Hemp*—Male: calix five-leaved; corolla none. Female: calix two-leaved; corolla none; styles five; seed one, covered with a succulent calix.

CANNABIS, *Hemp*—Male: calix five-parted; corolla none. Female: calix one-leafed, entire, gaping on one side; corolla none; styles two; nut bivalve, within the closed calix.

HUMULUS, *Hop*—Male: calix five-leaved; corolla none. Female: calix one-leafed, spreading obliquely, entire; corolla none; styles two; seed one, within a leafed calix.

ZANONIA, *Indian Cucumber*—Male: calix of three leaves; corolla in five deep segments; styles three; berry of three cells, with a lid; seeds winged, two in each cell.

FEUILLEA—Male: calix five-cleft; corolla five-cleft; stamens five, with five alternate barren filaments. Female: calix and corolla as in the male; styles three; berry hard, three-celled; seeds orbicular.

CANARIUM—Male: calix two-leaved; corolla three-petalled; stigma sessile; drupe with a three-cornered nut.

MELICYTUS—Calix five-toothed; corolla five-petalled, three times as long as the calix; nectary five scales. Male: anthers five, without filaments, fastened to the inside of the nectary. Female: stigma flattened out, four or five lobed; capsule berried, one-celled; seeds nestling.

NYSSA, *Sour Gum Tree*—Calix five-parted; corolla none; pistil one; drupe inferior; nut one-seeded. Male: stamens five, eight, ten, and twelve, seated around a peltate gland.

PICRAMNIA—Calix three or five parted; corolla three or five petalled; berry two-celled.

RICHERIA—Capsule corticate, six-valved, three-celled; seeds solitary, pendulous, below the tip of the columella; style trifid.

VILLARIA—Male: calix in five deep segments; corolla of five petals; nectary none; germen orbicular, imperfect. Female: calix and petals like the male; nectary of five leaves, alternate with the petals; style one; berry of three cells; seeds solitary.

6. HEXANDRIA *(Male Flowers with Six Stamens.)*

TAMUS, *Black Briony*—Male: calix six-parted; corolla none. Female: style trifid; berry three-celled, inferior; seed two in each cell.

SMILAX, *Sarsaparilla*—Calix six-leaved; corolla none. Female: styles three; berry three-celled; seeds two.

RAJANIA—Calix six-parted; corolla none. Female: styles three; germen inferior, three-celled, with two of the cells obliterated; capsule membraneous, with one wing; seed solitary.

DIOSCOREA, *Indian Yam*—Male: calix six-parted; corolla none. Female: calix six-parted; corolla none; styles three; capsule three-celled, compressed; seeds two, membranaceous.

BORASSUS—Corolla three-parted. Male: stamens six. Female: styles three; drupe three-seeded.

ELÆIS, *Oily Palm*—Calix of six leaves; corolla six-cleft. Female: calix six-leaved; corolla six-petalled; stigmas three, dilated; drupe fibrous; nut solitary, stony.

FERREOLA—Male: calix three-cleft; corolla tubular, three-cleft. Female: calix and corolla as in the male; berry superior, of two-cells; seeds solitary.

FIBRAUREA—Male: calix none; petals six. Female: calix none; petals six; stigmas three; single-seeded.

MAURITIA—Male flowers in an oblong sessile ament; calix one-leafed, cup-shaped, entire; capsule one-petalled, with a short tube, and a three-parted border; filaments six.

XEROTES—Male: calix of six leaves, three innermost combined at the base; corolla none; anthers peltate. Female: calix of six separate permanent leaves; styles three; capsule superior, coated, of three cells; valves with central partitions; seeds peltate, solitary.

7. OCTANDRIA *(Male Flowers with Eight Stamens.)*

RHODIOLA, *Rosewort*—Male: calix four-parted; corolla four-petalled; nectaries four. Female: calix and nectaries like the male, but smaller; petals of a coarse texture; capsules four, many-seeded.

MARGARITARIA—Male: calix four-toothed; corolla four-petalled. Female: calix and corolla as in the male; styles four or five; berry cartilaginous, four or five grained.

SHEPHERDIA—Male: calix four-cleft; corolla none; stamens eight, included, alternating with eight glands. Female: calix four-cleft, campanulate, superior; style one; stigma oblique; berry one-seeded.

8. ENNEANDRIA *(Male Flowers with Nine Stamens.)*

MERCURIALIS, *Dog's Mercury*—Male: calix three-parted; corolla none; stamens nine or twelve; anthers globular, twin. Female: calix three-parted; corolla none; styles two; capsule dicoccous, two-celled, one-seeded.

HYDROCHARIS, *Frog-bit*—Male: spathe two-leaved; calix trifid; corolla three-petalled; filaments, the three inner style-bearing. Female: calix trifid; corolla three-petalled; styles six; capsule six-celled, many-seeded, inferior.

UDORA—Spathe bifid. Male: calix three-parted; corolla of three petals; stamens nine, three of them interior. Female: calix three-parted, tube very long; petals three; sterile filaments three; utriculus about three-seeded; seeds cylindric.

9. DECANDRIA *(Male Flowers with Ten Stamens.)*

CARICA, *Papaw Tree*—Male: calix very small, five-toothed; corolla five-parted, funnel-form; filaments in the tube of the corolla, alternately shorter. Hermaphrodite: calix five-toothed; corolla five-parted; stigmas five; berry one-celled, many-seeded.

RIGGELARIA—Male: calix five-parted; corolla five-petalled; glands five, three-lobed; anthers perforated at the tip. Female: calix and corolla as in the male; styles five; capsule one-celled, five-valved, many-seeded.

SCHINUS, *Mastick Tree*—Male: calix five-parted; petals five. Female: berry three-celled.

GYMNOCLADUS, *Coffee-bean Tree*—Male: calix tubular, five-cleft; corolla of five petals. Female: flower as the male; style one; legume one-celled, internally somewhat pulpy; seeds roundish, large, and indurated.

10. DODECANDRIA *(Male Flowers with Twelve Stamens.)*

MENISPERMUM, *Moon Seed*—Male: petals, four outer, eight inner; stamens sixteen. Female: corolla as in the male; stamens eighteen, barren; berries two, one-seeded.

DATISCA, *Bastard Hemp*—Male: calix five-leaved; corolla none; anthers sessile, long, fifteen. Female: calix two-toothed; corolla none; styles three; capsule triangular, three-horned, one-celled, pervious, many-seeded, inferior.

STRATIOTES, *Water Aloe* or *Soldier*—Spathe two-leaved; periauth superior, trifid; petals three; berry six-celled.

EUCLEA—Male: calix four or five toothed; corolla four or five parted; stamens twelve or fifteen. Male: calix and corolla as in the male; germen superior; styles two; berry two-celled.

11. ICOSANDRIA *(Male Flowers with many Stamens inserted into the Calix.)*

HEDYCARYA—Calix eight or ten cleft; corolla none. Male: filaments none; anthers in the bottom of the calix, four-furrowed, bearded at the tip. Female: germens pedicelled; nuts pedicelled, one-seeded.

12. POLYANDRIA *(Male Flowers with many Stamens.)*

CLIFFORTIA—Male: calix three-leaved; corolla none; stamens about thirty. Female: calix three-leaved, superior; corolla none; styles two; capsules two-celled; seed one in each cell.

CYCAS—Male: ament strobile-form, with the scales covered every where beneath with pollen. Female: spadix sword-form; germen immersed into the corners of it, solitary; style one; drupe with a woody nut.

FLACOURTIA—Male: calix in five deep segments; corolla none; stamens very numerous. Female: calix of several leaves; corolla none; stigma radiated; berry superior, of many cells; seeds in pairs.

PERULA—Male: calix concave, of one leaf; petals none; nectary a plaited membrane; anthers quadrangular, simple; germens four, abortive. Female: calix concave, of one leaf; petals none; nectary a plaited membrane; capsule stalked, obovate, of three cells and three valves; seeds solitary.

POPULUS, *Poplar*—Male: calix of the ament a flat scale, torn at the edge; nectary turbinate, oblique, entire. Female: stigma four-cleft; capsule two-celled, two-valved; seeds very many, pappose.—Or, Male: calix, the scales of a catkin, torn; nectary turbinate, oblique, entire; stamens eight or more. Female: calix and corolla like the male; stigmas four or eight; capsule superior, with two cells and two valves; seeds winged with down.

TOXICODENDRUM—Male: calix of several leaves; corolla none; stamens from ten to twenty, very short. Female: calix of several imbricated leaves; corolla none; style one; stigmas three; capsule three-celled, six-valved; seeds two in each cell.

TREWIA—Male: calix of three leaves; corolla none. Female: calix of three leaves; corolla none; style one; stigmas several, feathery; capsule of three cells, and six valves; seeds solitary.

XYLOSMA, *Sweet Wood*—Male: calix in four or five deep segments; petals none; nectary angular, crenate; stamens from twenty to fifty. Female: calix and nectary as in the male; style very short; stigma slightly three-cleft; berry dry, of two incomplete cells; seeds two in each cell.

ZAMIA—Male: catkin tesselated; scales abrupt; anthers oval, sessile at the under side of each scale. Female: catkin tesselated; scales peltate; drupes two, at the under side of each scale.

13. MONADELPHIA (*Male Flowers with One Set of united Stamens.)*

TAXUS, *Yew Tree*—Male: calix none; corolla none; stamens many; anthers peltate, eight-cleft. Female: calix cup-shaped, entire; corolla none; style none; seed one, in an entire berried calix.

JUNIPERUS, *Juniper*—Male: calix of the ament a scale; corolla none; stamens three. Female: calix three-parted; petals three; styles three; berry three-seeded, irregular with the three tubercles of the calix.

NAPÆA—Calix five-cleft; petals five. Male: stamens monadelphous, very many, fertile; styles several, barren. Female: stamens monadelphous, very many, barren; styles several, longer than the stamens; capsule orbicular, depressed, ten-celled; seeds solitary.

EPHEDRA, *Shrubby Horse-tail*, or *Sea Grape*—Male: calix, the scale of a catkin in two segments; corolla none; stamens seven; anthers, four inferior, three superior. Female: calix cloven, five-fold; corolla none; pistils two; seeds two, enclosed in the pulpy calix.

CISSAMPELOS—Male: calix four-leaved; corolla none; nectary wheel-shaped; stamens four, with connate filaments. Female: calix one-leafed, ligulate, roundish; corolla none; styles three; berry one-seeded.

ADELIA—Male: calix three-parted; corolla none; stamens many, united at the base. Female: calix five-parted; corolla none; styles three, torn; capsule tricoccous.

ALCHORNEA—Male: calix three or five leaved; corolla none. Female: calix five-toothed; corolla none; style two-parted; capsule berried, dicoccous.

DOMBEYA—Male: calix, the scales of an ament, terminated by a leaflet; corolla none; anthers ten or twelve, without filaments. Female: calix, ament with many germens; corolla none; stigma bivalve, unequal; seeds many, in a roundish strobile.

DRYANDRA—Calix two-leaved; corolla five-petalled, (or calix five-petalled, resembling a corolla, surrounded by a two or three leaved calicle;) stamens nine; fruit three or four grained.

MYRISTICA, *Nutmeg Tree*—Calix trifid; corolla none. Male: filament columnar; anthers terminating, united. Female: capsule superior, drupaceous, two-valved; nut involved in an aril called the *mace*.

RUSCUS.—See *Dicecia Triandria.—Willd.*

XANTHE—Male: calix in five deep segments; petals five; filament columnar; anthers five, two-lobed, forming a peltate disk. Female: calix and corolla as in the male; stigmas five, sessile; capsule of five cells, with many pulpy seeds.

14. GYNANDRIA.

(This Order consists of such plants as have their male flowers furnished with stamens that grow out of a kind of style, or imperfect pistil, the perfect one being in the female flower.)

CLUYTIA—Calix five-leaved; corolla five-petalled; styles in the female flowers three; capsule three-celled; seed one.

CLASS XXIII.—POLYGAMIA.

Consisting of Plants having three different sorts of Flowers, on the same, or on separate Plants; some of them containing Pistils, some Stamens, and others both.

I. MONŒCIA.

(In this Order, perfect, or hermaphrodite flowers, are accompanied with male or female ones, or both, on the same plant.)

MUSA, *Plantain* and *Banana*—Calix, spathe partial, many-flowered; corolla two-petalled, one petal erect, five-toothed, the other nectariferous, concave, shorter; stamens six; style one; all the flowers hermaphrodites. Male hermaphrodite above; five filaments perfect; germen inferior, abortive. Female hermaphrodite, one filament only perfect; berry oblong, three-sided, inferior, many-seeded.

OPHIOXYLUM—Hermaphrodite: calix five-cleft; corolla five-cleft, funnel-form; stamens five; pistil one. Male: calix bifid; corolla five-cleft, with a funnel-form mouth; nectary cylindric; stamens two.

CELTIS, *Lote* or *Nettle Tree*—Hermaphrodite: calix five-parted; corolla none; stamens five; styles two; drupe one-seeded. Male: calix six-parted; corolla none; stamens six.

VERATRUM, *White Hellebore*—Calix none; corolla six-petalled, permanent, sessile, equal, bearing the stamens; styles permanent; capsules three, bursting at the inner edge; seeds numerous, compressed, imbricated, winged at each end.

FUSANUS—Hermaphrodite: calix five-cleft; corolla none; stamens four; germen inferior; stigmas four. Male: calix, &c. like the hermaphrodite; fruit abortive.

ANDROPOGON, *Camel's Hay, Spikenard*, &c.—Hermaphrodite: calix glume one-flowered; corolla glume awned at the base; stamens three; styles two; seed one. Male: calix and corolla the same; stamens three.

HOLCUS, *Indian Millet* and *Soft Grass*—Hermaphrodite: calix glume one or two flowered; corolla glume awned; stamens three; styles two; seed one. Male: calix glume two-valved; corolla none; stamens three.

APLUDA—Calix glume common bivalve; female floret sessile; males peduncled. Male: calix none; corolla bivalve; stamens three. Female: calix none; corolla bivalve; style one; seed one, covered.

ISCHÆMUM—Hermaphrodite: calix glume two-flowered; corolla two-bivalved; stamens three; styles three; seed one. Male: calix and corolla as in the other; stamens three.

CENCHRUS, *Hedgehog Grass*—Involucre laciniate, echinate, two-flowered; calix glume two-flowered, one male, the other hermaphrodite. Hermaphrodite: corolla glume awnless; stamens three; seed one. Male: corolla glume awnless; stamens three.

ÆGILOPS, *Hard Grass*—Calix a glume, subtriflorous, cartilaginous; corolla a glume, terminating in a threefold awn; stamens three; styles two; seed one.

MANISURIS, *Scaly Grass*—Hermaphrodite: calix glume two-valved, one-flowered; outer valve emarginate at the top and sides; corolla less than the calix; stamens three; style bifid. Male: as in the hermaphrodites, but with the flowers in the lower side of the same spike, standing out more.

VALANTIA, *Crosswort*—Hermaphrodite: calix none; corolla four-parted; stamens four; style bifid; seed one. Male: calix none; corolla three or four parted; stamens four or three; petals obsolete.

BRABEIUM, *African Almond*—Hermaphrodite: scales of the ament; corolla four-parted, revolute above; stamens four; pistil one; drupe roundish; seed globular. Male: scales of the ament; corolla four or five parted; stamens four, inserted into the throat; style bifid, abortive.

PARIETARIA, *Pellitory*—Two hermaphrodite flowers and one female, in a flat six-leaved involucre; calix four-cleft; corolla none; style one; seed one, superior, elongated. Hermaphrodite: stamens four. Female: stamens none.

HERMAS—Hermaphrodite: umbel terminating; involucre universal and partial; umbellets with truncate rays, the central one floriferous; petals five; stamens five, barren; seeds in pairs, suborbiculate. Male: umbels lateral, with universal and partial involucres; umbellets many-flowered; petals five; stamens five, fertile.

ATRIPLEX, *Orache*, or *Sea Purslane Tree*—Hermaphrodite: calix five-leaved; corolla none; stamens five; style two-parted; seed one, depressed. Female: calix two-leaved; corolla none; stamens none; style two-parted; seed one, compressed.

ACER, *Maple Tree*—Calix five-cleft; corolla five-petalled; stamens eight, or ten; germens two, or three, superior; style simple; capsules two, sometimes three, with one seed in each, terminated by a wing. Males without germen or style.

GOUANIA, *Chaw-Stick*—Hermaphrodite: calix five-cleft; corolla none; anthers five, under a veil; style three-cleft; fruit inferior, tripartite. Male: similar, but without germen and stigma.

TERMINALIA—Calix five-parted; corolla none; stamens ten; nectary five-cleft, hairy; drupe inferior, boat-shaped.

CLUSIA, *Balsam Tree*—Male: calix four or six leaved; leaflets opposite, imbricate; corolla four or six petalled; stamens numerous. Female: calix and corolla as in the male; nectary formed by the coalition of the anthers, including the germen; capsule five-celled, five-valved, stuffed with pulp.

MIMOSA, *Sensitive Plant*—Calix five-toothed; corolla five-cleft; stamens five, or more; pistil one; legume superior, with many cells. Some male flowers.

AILANTHUS—Male: calix five-parted; corolla five-petalled; stamens two. Female: calix and corolla as in the male; germs three to five; styles lateral; pericarp membranaceous, one-seeded. Hermaphrodite: calix and corolla as in the male; stamens two to three.

ANACARDIUM, *Cashew Nut*—Calix five-leaved; petals five, reflex; anthers ten, one only fertile; nut kidney-shaped, on the top of a fleshy receptacle.

ANTHESTERIA—Calix cleft at the base in four equal divisions.

COPROSMA—Calix one-leafed, five-toothed; corolla five or six cleft; stigmas five, six, or seven. Hermaphrodite: styles two, long; berry containing two flattish seeds.

CURCULIGO—Calix none; corolla six-petalled; filaments six; pistil one; capsule, seeds beaked.

CYMBACHNE—Inflorescence half spiked. Hermaphrodite: calix two-glumed, one-flowered, parallel to the rachis, outer valve linear, the opposite boat-form. Female: calix one-glumed, ovate, opposite to the rachis.

EUCLEA—Calix with five teeth; corolla in five deep equal segments; stamens fifteen; styles two; capsule superior, of three cells, pulpy-coated; seeds solitary, enclosed in an aril.

EXOCARPUS—Calix inferior, in five deep segments; corolla none; stamens five; pistil one; stigma peltate; nut of one cell, standing on a hollow fleshy receptacle.

GYROCARPUS—Male: calix, perianth of five deep, ovate, equal segments; stamens as in the united flowers, with barren filaments; pistil one.

HYPELATE—Calix five-leaved; corolla five-petalled; stigma bent down, three-cornered; drupe one-seeded.

KOELREUTERIA—Calix five-leaved; petals four; nectary double, four scalelets and three glands; stamens eight, fixed to a column; germen three-sided, fixed to the same column; capsule three-celled, with two seeds in each.

RHAPIS—Calix trifid; corolla one-petalled, trifid; stamens six; pistil one.

ROTTBŒLLIA—Rachis jointed, roundish, in most species filiform; calix ovate-lanceolate, flat, one or two valved; florets alternate, on a flexuose rachis.

2. DIŒCIA.

(In this Order, the different kinds of flowers grow on two distinct plants.)

1. *Such as are polygamous by Hermaphrodites and Females.*

FRAXINUS.—See *Diandria Monogynia.*

GLEDITSIA, *Three-horned Acacia*—Hermaphrodite: calix four-cleft; corolla four-petalled; stamens six; pistil one. Male: calix three-leaved; corolla three-petalled; stamens six. Female: calix five-leaved; corolla five-petalled; pistil one; legume?

2. *By Hermaphrodites and Males.*

DIOSPYRUS, *Indian Date-plum*—Hermaphrodite: calix four-cleft; corolla pitcher-shaped; stamens eight; style four-cleft; berry eight-seeded. Male: calix, corolla, and stamens, of the other.

NYSSA, *Water Tupelo*—Calix five-parted; corolla none. Male: stamens ten. Hermaphrodite: stamens five; pistil one; drupe inferior.

PISONIA—Calix scarcely any; corolla bell-shaped; stamens five or six; pistil one; capsule superior, one-celled, valveless; berry one-seeded. Male and female on the same, or on different plants.

3. *By Androgynes and Males.*

ANTHOSPERMUM, *Amber Tree*—Calix four-parted; corolla none; stamens four; pistils two; germen inferior. Male and female in the same, or a distinct plant.

STILBE—Calix inferior, double; the outer of three leaves, the inner five-toothed, cartilaginous; corolla funnel-shaped; capsule of one cell and one valve, separating entire from the base; seeds solitary.

ARCTOPUS—Male: umbel compound; involucre five-leaved; corolla five-petalled; stamens five; pistils two, abortive. Female, or *androgynous:* umbel simple; involucre four-parted, spiny, very large, containing very many male floscules in the disk, and four female ones in the ray. Male: petals five; stamens five. Female: petals five; styles two; seed one, bilocular, inferior.

PANAX, *Ginseng*—Umbel of many rays; corolla five-petalled; stamens five. Hermaphrodite; calix five-toothed, superior; styles two; berry two-celled. Male: calix entire.

CHRYSITRIX, *Cape Golden Hair*—Glume bivalve; corolla of numerous setaceous chaffs; stamens many, solitary, between the chaffs; pistil one.

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BREYNIA—Calix one-leafed; corolla none. Hermaphrodite: calix six-parted; anthers five, linear, fastened to the style; berry three-celled; seeds two. Male: calix five-parted; filaments five; anthers roundish. Female: stigmas five, obcordate, petaloid, without any style; capsule five-celled, seed solitary.

BURSERA, *Jamaica Birch Tree*—Hermaphrodite: calix three-leaved; corolla three-petalled; capsule fleshy, three-valved, one-seeded. Male: calix five-toothed; corolla five-petalled; stamens ten.

CERATONIA, *Carob Tree*—Calix five-parted; corolla none; stamens five; style filiform; legume coriaceous, many-seeded. Diœcous, male and female separate.

CHAMÆROPS—Hermaphrodite: calix three-parted; corolla three-petalled; stamens six; pistils three; drupes three, one-seeded. Males: diœcous, as in the hermaphrodite.

FICUS, *Fig Tree*—Receptacle, common turbinate, fleshy, converging, concealing the floscules, either on the same or on a distinct individual. Male: calix three-parted; corolla none; stamens three. Female: calix five-parted; corolla none; pistil one; seed one.

LIGHTFOOTIA—Calix four-leaved; corolla none. Female and Hermaphrodite: stigma sessile; berry umbilicated, one-celled, with three to six seeds.

PENNANTIA—Calix none; corolla five-petalled; stamens five; pericarp three-sided, two-celled, with solitary subtriquetrous seeds.

RICHERIA.—See *Diœcia Pentandria.*

SPINIFEX—Hermaphrodite: calix glume two-valved, two-flowered; valves parallel to the rachis; corolla two-valved, awnless; stamens three; styles two. Male: calix, common with the hermaphrodite; corolla and stamens similar.

CLASS XXIV.—CRYPTOGAMIA.

Consisting of Plants whose Flowers are scarcely visible, so that their fructification has not been distinctly described.

1. FILICES, or Ferns.

(According to Dr. Swartz's Arrangement.)

1. *Ferns whose Capsules are surrounded with an elastic ring.*

* *Without an Involucre.*

ACROSTICUM—The fructifications covering the whole under surface of the frond.

MENISCIUM—Capsules heaped in crescents, interposed between the veins of the fronds.

HEMIONITIS—Capsules digested into lines, meeting together, either intersecting each other, or branched.

GRAMMITIS—Spots linear, straight, scattered.

TÆNITIS—Spots linear, longitudinal, continued, solitary between the rib and margin on each side, parallel.

POLYPODIUM, *Polypody*—Capsules annulated, distributed in roundish dots, on the back or lower surface of the frond.

** *Spots veiled with an Involucre.*

ASPIDIUM—Fructifications in roundish, scattered, not marginal, dots; involucre umbilicated, separating almost all round.

ASPLENIUM—Fructifications disposed in right lines along the under side of the frond; involucre lateral, separating inwards.

DAREA—Spots linear, near the margin; involucre lateral, separating outwards.

SCOLOPENDRIUM—Fructifications in scattered double lines, between the veins; involucre originating from each vein,

continued, folding over each other, at length separating longitudinally.

Diplazium—Spots linear, scattered, in pairs, simple or branched, at each side of a vein; involucre of two valves, originating from the vein, separating outwards.

Lonchites—Capsules disposed in lunulated lines, lying under the sinuses of the fronds; involucre from the inflexed margin of the leaf, separating inwards.

Pteris, *Female Fern*, or *Brakes*—Fructifications in an uninterrupted marginal line; involucre from the margin of the frond turned in, uninterrupted, separating on the inner side.

Vittaria—Spots linear, continued, longitudinal along the disk or near the edge of the leaf; involucre double, uninterrupted, one separating outwards, the other inwards.

Onoclea—Capsules under the recurved and contracted pinnules of the frond resembling pericarps.

Blechnum—Fructifications disposed in two lines, approaching to the rib of the frond, and parallel.

Woodwardia—Groups of capsules oblong, distinct, straight, ranged in a simple row, in bordered cavities, parallel to each side of the rib; involucre superficial, vaulted, separating towards the rib.

Lindsea—Capsules annulated, continued, nearly marginal, lateral or terminal lines; involucre arising from the surface of the leaf, membranaceous, continued, entire or slightly crenate, at length reflexed, permanent.

Adiantum—Fructifications assembled in oval spots at the end of the fronds, which are turned back; or at the reflexed tip of the frond underneath.

Cheilanthes—Capsules annulated, in distinct marginal dots; involucre of membranous, distinct, inflated scales, separating internally.

Davallia—Spots roundish, separate, near the margin; involucre superficial, scale-like, distinct, terminating a vein, and separating outwards.

Dicksonia—Fructifications kidney-shaped, lying under the edge of the frond at the lower surface; outer valve formed of the substance of the leaves itself, inner membranaceous.

Cyathea—Spots roundish, scattered; receptacle of the capsules central, within a cup-shaped involucre, opening at the top.

Trichomanes, *Hare's-foot Fern*—Fructifications inserted into the margin of the frond, separate; involucre one-leafed, urn-shaped, undivided, opening outwards; columns extending beyond the involucre like styles. Habit membranaceous, semi-transparent.

Hymenophyllum—Fructifications placed at the edge of the frond; involucre of two valves, opening outwardly.

2. *Capsules of one cell, destitute of a distinct ring, opening by a longitudinal fissure on one side.*

Schizæa—Capsules somewhat turbinate, with radiating furrows at the top bursting laterally, sessile, covering the back of an aggregate appendage to the frond; involucre from the inflexed margin of the appendages, uninterrupted.

Lygodium—Capsules sessile, ovate, attached by their middle, reversed, radiated at top, in two rows, on the back of the narrow processes of the frond; involucre of solitary scales, separating the capsules.

Mohria—Capsules separate, sessile, at the edge of the leaf; involucres from the inflexed crenate margin.

Anemia—Capsules crowded, sessile, naked, on the branches of a compound spike.

Osmunda, *Moonwort*, or *Flowering Fern*—Capsules distinct, dispersed in a raceme in such a manner as to look the same way, or else heaped on the back of the pinna or division of the frond, sessile, globular, opening transversely, without any ring; seeds very many, extremely minute.

Todea—Capsules nearly sessile, on the transverse, almost parallel veins of the leaf, naked.

Mertensia—Capsules sessile, in roundish, superficial, scattered, naked spots.

Gleichenia—Capsules three or four together, sessile in a little hemispherical depression of the leaf.

Angiopteris—Capsules sessile, naked, placed in a double series, in little parallel neighbouring spots, all together forming a longitudinal line near the margin.

3. *Capsules destitute of all traces of a ring.*

* *Capsules of many cells.*

Marattia—Capsules oval, gaping longitudinally at top, with seven cells on each side.

Danea—Capsules oblong-linear, transverse, parallel, immersed in the frond, with two rows of cells, opening at the top.

** *Capsules of one cell, with two valves.*

Botrychium—Capsules nearly globose, naked, smooth, without a ring, united to the stalk of a compound spike, distinct, each of one cell, and two valves connected behind, bursting transversely in front.

Ophioglossum, *Adder's Tongue*—Capsules numerous, connected by a membrane into a distich spike, subglobular; when ripe opening transversely, without any elastic ring; seeds very many, extremely minute.

4. *Capsules axillary, naked, of one, two, or three cells.*

Lycopodium—Capsules of one cell.

Tmesipteris—Capsules of two cells, with a transverse structure.

Psilotum—Capsules of two or three cells and two or three valves, coriaceous, opaque, with many seeds.

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Allantodia—Fructifications in scattered oblique lines, accompanying a vein; involucre vaulted, originating laterally from the vein, and inserted into it by both margins, at length separating at the inner one.

Cænopteris—Fructifications in submarginal lateral lines, covered with a membrane, gaping on the outside.

Equisetum, *Horse-tail.*—See *Miscellaneæ.*

Isoetis—Male: anthers within the base of the frond. Female: capsule two-celled, within the base of the frond.

Woodsia—Groups of capsules oblong, distinct, straight, ranged in a simple row, in bordered cavities, parallel to each side of the rib; involucre superficial, vaulted, separating towards the rib.

2. MUSCI, or Mosses.

(See Vol. ii. p. 147, of the Botanical Dictionary.)

Sphagnum, *Bog Moss*—Capsule sessile, without a fringe; veil cut round, its base remaining on the base of the capsule; anthers each surrounded with a ring.

Buxbaumia—Capsule ovate, oblique, gibbous on one side; peristeum double, outer of sixteen teeth, truncate, inner membranaceous, plaited.

Phascum, *Earth Moss*—Capsule ovate, veiled, subsessile, or on a short bristle, closed on every side, sometimes with the rudiment of a lid, never opening. Males subdiscoid, terminating, or gemmaceous, axillary.

Andræa—Capsule oblong, of four valves, whose points adhere to the lid; fringe none.

TETRAPHIS, *Four-toothed Moss*—Capsule oblong; fringe simple, of four pyramidal, erect, unconnected teeth.

ENCALYPTA, *Extinguisher Moss*—Capsule cylindrical; fringe of sixteen linear, upright teeth; veil bell-shaped, inflated, lax.

GRIMMIA—Capsule ovate; fringe simple, of sixteen teeth, broadest at their base; flowers terminal; veil cylindrical.

DICRANUM, *Fork Moss*—Capsule oblong; fringe of sixteen flat cloven teeth, a little inflexed.

TRICHOSTOMUM, *Fringe Moss*—Capsule oblong; fringe of thirty-two capillary, straitish teeth, approximated, or united in pairs.

TORTULA, *Screw Moss*—Capsule oblong; fringe simple, of numerous capillary teeth, spirally and repeatedly twisted together.

ORTHOTRICHUM, *Bristle Moss*—Capsule oblong, terminal; outer fringe of sixteen teeth, inner of eight or sixteen thread-shaped teeth, sometimes wanting; veil angular, mostly clothed with erect hairs.

PTEROGONIUM, *Wing Moss*—Capsule oblong, from a lateral scaly sheath; fringe simple, of sixteen linear upright teeth; veil generally hairy.

NECKERA—Capsule oblong; peristome double; outer with sixteen sharp teeth; inner with sixteen distinct cilias, alternate with teeth of the outer. Males geminaceous, on distinct plants.

HYPNUM, *Feather Moss*—Peduncle from a lateral tubercle, fenced with scales; capsule, outer fringed with sixteen teeth. Male a bud, generally on a different plant, withering.

HOOKERIA—Capsule ovate, with dot-like reticulations, from a lateral scaly sheath; outer fringe of sixteen teeth, inner of a sixteen-toothed membrane; veil reticulated and cellular, undivided.

FONTINALIS, *Water Moss*—Capsule oblong, lateral, enclosed in a scaly sheath; outer fringe of sixteen teeth, dilated at the base, inner reticulated.

FUNARIA, *Cord Moss*—Veil angular; fringe double, with oblique or twisted teeth; lid very slightly prominent.

BARTRAMIA—Capsule spherical, at length furrowed; outer fringe of sixteen tapering teeth, inner a plaited base.

MNIUM, *Spring Moss*—Capsule with a lid; calyptre smooth; bristle from a terminating tubercle. Male flowers headed, or discoid.—Or, according to *Withering*, capsule with a veil; fringe with sixteen teeth; sometimes, though rarely, with four. Male, bud circular, rarely knob-like, mostly on a separate plant.

BRYUM, *Thread Moss*—Capsule ovate-oblong; peristeum double, outer with sixteen broadish sharp teeth, inner membranaceous, plaited and keeled, jagged, jags broadish, capillary, alternate. Males capitate, or discoid, or gemmaceous, on the same or a different plant.

POLYTRICHUM, *Hair Moss*—Outer fringe of thirty-two or sixty-four short, flat, incurved teeth, inner a flat, transverse, orbicular, undivided membrane; veil generally double, the outer hairy.

LESKIA—Capsule oblong; peristome double, the exterior with sixteen teeth, acute; the interior membranaceous, divided into equal segments. Males gemmaceous in different individuals.

LYCOPODIUM, *Club Moss*—Fructifications in the axils of the scales, digested into long imbricate spikes, or of the leaves themselves, sessile; capsule kidney-shaped, two-valved, elastic, many-seeded; veil none.

MEESIA—This differs from *Bryum* solely in the shortness and bluntness of the teeth of its external fringe, which is not half so long as the inner one.

SPLACHNUM, *Gland Moss*—Capsule cylindrical, placed on a fleshy receptacle; fringe simple, of sixteen teeth, standing in pairs.

TIMMIA—Capsule ovate; outer fringe of sixteen pointed teeth; inner membranaceous, with jointed teeth combined at the top. Male flowers on the same plant, axillary, stalked, bud-shaped.

3. HEPATICÆ, OR LIVERWORTS.

(Small Herbaceous Plants resembling Mosses.)

MARCHANTIA—Male: calix salver-shaped; anthers numerous, annulated, imbedded in its disk. Female: calix peltate, flowering on the upper side; capsules deflexed, opening at the top; seeds fixed to elastic fibres.

RICCIA—Warts scattered. Female: germen globose, sunk, with the style in the frond; capsule exposed, globose, crowned with the style, of one cell; seeds numerous, elliptical.

TARGIONIA—Capsule globose, of two concave valves, and one cell; seeds numerous, combined by fibres, into a globe.

ANTHOCEROS, *Horn Liverwort*—Male: calix sessile, cylindric, entire; anther very long, subulate, two-valved. Female: calix in six divisions, containing three seeds.

4. ALGÆ (LICHENS AND SEA WEEDS.)

(Plants which scarcely admit of a distinction of root, stem, and leaf; much less of a description of the parts of the flowers.)

JUNGERMANNIA, *Star-tip*—Male: anthers aggregate in powdery heads. Female: capsule of four valves, on a stalk rising from a tubular calix; seeds attached to elastic filaments.

LICHEN, *Liverwort*—Male: scattered powdery warts. Female: shields or tubercles, in whose disks the seeds are lodged, *(corrected.)*

FUCUS, *Sea-weed*, or *Wrack*—Seeds produced in clustered tubercles, which burst at their summits.

ULVA, *Laver*—Frond membranaceous or gelatinous; seeds solitary, scattered throughout its substance under the cuticle.

BLASIA—Essential Character not described.

CONFERVA, *River-weed*—Unequal tubercles, in a very long capillary filament.

BYSSUS—Fibres simple, uniform, like fine down; fructifications unknown.

ENDOCARPON—Receptacles immersed, globose, concave, in which the seeds are imbedded.

RIVULARIA—Frond gelatinous, firm, destitute of an external cuticle; fructification among jointed filaments, lodged in the substance of the frond.

SPHÆROCARPUS, *Bladder-grain*—Calix inferior, of one leaf, inflated, entire; seeds very numerous, collected into a globe at the bottom of the calix.

VAUCHERIA—Anther solitary, awl-shaped, incurved; capsules adjoining to the anther, ovate, single-seeded, in pairs or solitary.

5. FUNGI (MUSHROOMS AND FUNGUSES.)

(Consisting of Plants of a cork-like texture, and of short duration, bearing their seeds either in gills or tubes, or attached to fibres, or to a spungy substance.)

AGARICUS, *Common Mushroom*—Pileus or cap with gills underneath; gills differing in substance from the rest of the plant, composed of two laminas; seeds in the gills.

Boletus—Lower surface composed of tubes.
Clathrus—Grows in clusters, mostly fixed to a membranaceous base; capsules globular or oblong; seeds escaping from its whole surface through openings made by the separations of the fibres.
Clavaria—Fungus oblong, upright, club-shaped; seeds emitted from every part of its surface.
Helvella—Pileus on the stem smooth on both sides; seeds thrown out from under the surface.
Hydnum—A horizontal fungus, echinated beneath with awl-shaped fibres.
Lycoperdon—Fungus roundish, fleshy, firm, becoming powdery, and opening at the top; seeds fixed to filaments, connected with the inner coat of the plant.
Mucor—Seeds naked, or in transparent capsules or vesicles at the end of the stem.
Peziza—Fungus bell-shaped, sessile, concealing lens-shaped seed-bearing bodies; plant concave; seeds on the upper surface only discharged by jerks.
Phallus, *Morel*—Fungus even on the under surface; a net-work of cells on the upper surface; seeds in the cells.
Sphæria—Capsules roundish, immersed, filled with jelly, which becomes a mass of minute volatile seeds.
Tremella, *Jelly-bladder*—Fructifications scarcely perceptible, in a membranaceous, gelatinous, expanded, undulated substance.
Tuber, *Truffle*—Roundish, fleshy, solid, closed; its substance variegated with veins bearing seeds.
Uredo, *Blight*—Coat none; powder naked, deciduous; seeds uniform, generally globose.
Xyloma—Flat, nearly orbicular; receptacle various, hard, somewhat fleshy internally, either remaining closed, or bursting unequally.
Xylostroma, *Oak Leather*—Expanded, coriaceous, two-sided, shapeless, concealed; surface smooth and even; seminal globules very minute, attached to internal fibres.

6. MISCELLANEÆ.

(Including Plants not easily referred to any of the five foregoing Orders.)

Equisetum, *Horse-tail*—Catkin with peltate scales, fructifying on their inside; partial involucres tubular, of two valves; seeds numerous, naked, surrounded by four spiral stamens.
Marsilea—Involucre ovate, closed, of many androgynous cells, in two rows; anthers numerous, clustered round the base of the pistils, of one cell, with globose pollen; germens in two rows, sessile, oval.
Pilularia, *Pillwort*, or *Pepper Grass*—Common receptacle globose, with four cells and four valves, lined with numerous anthers, and many globose germens beneath them.

PALMÆ, or Palms.

(Comprehending such Plants as have a spadix and spathe.)

Areca, *Cabbage Tree.*—See *Monœcia Enneandria.*
Borassus.—See *Diœcia Hexandria.*
Caryota.—See *Monœcia Polyandria.*
Chamærops, *Dwarf Fan Palm.*—See *Polygamia Diœcia.*
Corypha, *Great Fan Palm*—Flowers hermaphrodite; spathe universal none; spathes partial numerous; berry, or drupe, globular; seed bony.
Cycas.—See *Diœcia Polyandria.*
Elæis, *Oily Palm.*—See *Diœcia Hexandria.*
Elate.—See *Monœcia Triandria.*
Phœnix, *Date Palm.*—See *Diœcia Triandria.*

LINNEUS'S NATURAL ORDERS OF PLANTS.

Having in the BOTANICAL DICTIONARY followed Linneus's Artificial Arrangement, we shall here present to the public his *Natural Orders of Plants*, collected from a posthumous publication, compiled from his private courses of Lectures by two of his pupils, and given to the public by one of them, *Giseke*, at Hamburg, in 1792, under the title of *Caroli a Linne Prælectiones in Ordines Naturales Plantarum*.—A natural arrangement of the species, genera, orders, and classes, free from heterogeneous combinations, and disturbing no real affinities, is the point of perfection which every botanist should labour to approach. The great plan of natural affinities, sublime and extensive, requires the concert of every lover of the science, and the exploring of every country towards its completion. That this system, says Linneus, is no chimera, will satisfactorily appear from hence, that all plants, of what order soever, shew an affinity to others; and hence, if this affinity, or the links of this natural chain, could be once made out and connected, not only the virtues of a great number of species may be ascertained, but we may know with certainty how to find a proper succedaneum for plants which cannot easily be had.

The following are the Orders, fifty-eight in number, with the Genera of each, as left by Linneus, together with such additions as have been made by other Botanists since his time.

1. PALMÆ.

These are mostly of the shrub and tree kind, and include the following genera: 1. *With pinnate leaves:* Calamus, Phœnix, Arica, Elate, Cocos, Elais, Caryota, Nipa, Geonoma, and Seafortia. 2. *With palmate, or fan-shaped leaves:* Corypha, Licuala, Latania, Borassus, Chamærops, Thrinax, Rhapis, and Livistonia.

2. PIPERITÆ.

These plants are of the pepper kind, and consist of the following genera: Ambrosinia, Arum, Calla, Dracontium, Pothos, Zostera, Acorus, Orontium, Piper, and Saururus.

3. CALAMARIÆ.

From *calamus*, a reed, grass-leaved plants, having generally the same kind of leaves as the Grasses, but without a two-valved glume.—The genera are, Cyperus, Eriophorum, Schœnus, Scirpus, Carex, Sparganium, Typha, Seleria, Restio, Gahnia, Kyllingia, and Fuirena.

4. GRAMINA.

True Grasses; as, Agrostis, Aira, Alopecuris, Anthoxanthum, Aristida, Arundo, Avena, Bobartia, Briza, Bromus, Cinna, Cornucopia, Cynosurus, Dactylis, Elymus, Festuca, Hordeum, Lagurus, Lolium, Lygeum, Melica, Milium, Nardus, Oryza, Panicum, Paspalum, Phalaris, Phleum, Poa, Saccharum, Secale, Stipa, Triticum, Uniola, Coix, Olyra, Pharus, Tripsacum, Zea, Zizania, Ægilops, Andropogon, Apluda, Cenchrus, Holcus, and Ischæmum.

5. TRIPETALOIDEÆ.

From *tres*, three, and *petalum*, a petal; plants having no very striking characters, and nearly allied to the Grasses. The genera are, Juncus, Aphylanthus, Triglochin, Scheuchzeria, Elegia, Flagellaria, Calamus, Butomus, Alisma, and Sagittaria.

6. ENSATÆ.

From *ensis*, a sword, alluding to their sword-shaped leaves; as Antholyza, Callisia, Commelina, Crocus, Eriocaulon, Ferraria, Gladiolus, Iris, Ixia, Moræa, Pontederia, Sisyrinchium, Tradescantia, Wachendorfia, and Xyris.

7. ORCHIDEÆ.

The Orchis tribe.—Consisting of the following genera: Orchis, Satyrium, Ophrys, Serapis, Limodorum, Arethusa, Cypripedium, Epidendrum, Therbymitra, Disa, Bipinnula, Vanilla, Pogonia, Pterigodium, Disperis, Corycium, Neottia, Cranichis, Epipactis, Melaxis, Cymbidium, Oncidium, Aërides, Dendrobrium, Stelis, Lepanthes, Diuris, Bonatea, Hebenaria, Anguloa, Gongora, Masdevallia; and the following found in New Holland: Epiblema, Orthoceras, Cryptostylis, Prasophyllum, Genoplesium, Calochilus, Microtis, Acianthus, Cyrtostylis, Chiloglottis, Eriochilus, Caladenia, Lyperanthus, Glossodia, Pterostylis, Corysanthes, Calanea, Gastrodia, Dipodium, and Saracochilus.

8. SCITAMINEÆ.

From *scitamentum*, a dainty.—The genera of this order are, Alpinia, Amomum, Canna, Costus, Curcuma, Kæmpferia, Maranta, Musa, and Thalia.

9. SPATHACEÆ.

So called from their flowers protruding from a spathe or sheath, and are nearly allied in habit and structure to the liliaceous plants, from which they are chiefly distinguished by their spathe.—The genera are, Allium, Amaryllis, Bulbocodium, Colchicum, Crinum, Galanthus, Gethyllis, Hæmanthus, Leucoium, Narcissus, and Pancratium.

10. CORONARIÆ.

Liliaceous plants. A *coronary* flower implies a beautiful one.—The genera included in this order are, Albuca, Cyanella, Fritillaria, Helonius, Hyacinthus, Hypoxis, Lilium, Melanthium, Ornithogalum, Scilla, Tulipa, Agave, Aletris, Aloe, Anthericum, Asphodelus, Bromelia, Burmannia, Hemerocallis, Polyanthes, Tillandsia, Veratrum, and Yucca.

11. SARMENTASÆ.

From *sarmentum*, a long shoot; the name alludes to the long twining, or trailing stems, prevalent in this order.—In this order are the following genera: Alstromœria, Aristolochia, Asarum, Asparagus, Centella, Cissampelos, Convallaria, Cytinus, Dioscorea, Erythronium, Gloriosa, Medeola, Menispermum, Paris, Rajania, Smilax, Tamus, Trillium, and Uvularia.

12. HOLERACEÆ.

From *holus*, pot-herbs. This order consists of plants which enter into the economy of domestic affairs.—The genera are, Anabasia, Anacardium, Atraphaxis, Basella, Beta, Blitum, Bucida, Calligonum, Callitriche, Camphorosma, Chenopodium, Coccoloba, Corispermum.

13. SUCCULENTÆ.

From *succus*, juice; succulent plants.—The genera are, Aizoon, Cactus, Galenia, Mesembryanthemum, Neurada, Reaumuria, Tamarix, Tetragonia, Cotyledon, Crassalu, Penthorum, Rhodiola, Sedum, Sempervivum, Septas, Suriana, Tillea, Claytonia, Nama, Portulaca, Sesevium, Trianthema, Adoxa, Chrysoplenium, Hydrangea, Mitella, Saxifraga, and Tiarella.

14. GRUINALES.

From *grus* or *gruis*, a crane. The Geranium tribe.—In this order are reckoned the following genera: Aldrovanda, Averrhoa, Drosera, Fagonia, Geranium, Guaiacum, Linum, Oxalis, Quassia, Tribulus, and Zygophyllum.

15. INUNDATÆ.

The plants of this order are aquatic.—It consists of the following genera: Zannichellia, Ruppia, Potamogeton, Myriophyllum, Ceratophyllum, Proserpinaca, Elatine, Hippurus, Chara, Naïs, Aponogeton, Saururus, Serpicula, Callitriche, Lemna, and Pistia.

16. CALYCIFLORÆ.

From *calyx* the flower-cup, and *flos*, the flower: such plants as have the stamens inserted into the calix.—In this order are the following genera: Osyris, Trophis, Hippophaë, and Elæagnus.

17. CALYCANTHEMÆ.

Consisting of plants, which, among other characters, have the corolla and stamens inserted into the calix.—In this order are the following genera: Epilobium, Onothera, Jussieua, Ludwigia, Isnardia, Ammannia, Peplis, Lythrum, Glaux, Rexia, Gaura, Grislea, Mentzelia, Loosa, Frankenia, Melastoma, Osbeckia.

18. BICORNES.

Plants whose anthers have the appearance of two horns, their pollen being discharged by two pores, or sometimes two tubes.—In this order are the following genera: Erica, Vaccinium, Blæria, Azalea, Myrsine, Andromeda, Arbutus, Clethra, Epigea, Gaultheria, Kalmia, Ledum, Pyrola, Rhododendrum, Rhodora, Royena, Garcinia, Halesia, Styrax, Citrus, and Diospyrus.

19. HESPERIDÆA.

The Myrtle tribe; including the following genera: Caryophyllus, Eugenia, Myrtus, Philadelphus, and Psidium.

20. ROTACEÆ.

From *rota*, a wheel: consisting of plants with one wheel-shaped petal without a tube.—The genera are, Anagallis, Centunculus, Chironia, Exacum, Gentiana, Lysimachia, Phlox, Sarothra, Swertia, Trientalis, Ascyrum, Cistus, and Hypericum.

21. PRECIÆ.

From *precius*, early.—In this order are the following genera: Primula, Androsace, Aretia, Cortusa, Cyclamen, Diapensia, Dodecatheon, Soldanella, Limosella, Hottonia, Menyanthes, and Samolus.

22. CARYOPHYLLEI.

Linnens gives this order the following character: Root fibrous; stem herbaceous, seldom shrubby, jointed; branches generally alternate; leaves simple, almost always inclining to lanceolate, undivided, sessile, or narrowing into a petiole, opposite, obvulate, most commonly smooth; flower nearly sessile; stamens either equal or double the number of the petals; pistils from one to five; fruit a capsule, one-celled, or with as many cells as there are styles. Mostly natives of Europe. The genera are divided into four sections by *Gieseke*, 1. Dianthus, Saponaria, Gypsophila, Velezia, Drypis, Silene, Cucubalus, Lychnis, Agrostemna, and Sheffeldia. 2. Spergula, Cerastium, Arenaria, Stellaria, Alsine, Holosteum, Cherleria, Sagina, Mœhringia, and Buffonia. 3. Pharnaceum, Glinus, Mollugo, Polycarpon, Minuartia, Queria, Ortega, Lœflingia, and Rotala. 4. Scleranthus, and Polypremum.

23. TRIHILATÆ.

From *tres*, three, and *hilum*, an external mark on the seed; consisting of plants with three seeds, which are marked distinctly with an external cicatrix or scar, where they were fastened within to the fruit.—In this order the following genera are enumerated: Melia, Trichilia, Acer, Æsculus, Banisteria, Malpighia, Triopteris, Cardiospermum, Paullinia, Sapindus, Staphylæa, and Tropælum.

24. CORYDALES.

This order consists of plants which have irregular flowers, somewhat resembling (as the name implies) an helmet or hood: they are mostly herbaceous, and perennial; as, Epimedium, Hypecoum, Leonticе, Melianthus, Pinguicula, Utricularia, Fumaria, Impatiens, and Monniera.

25. PUTAMINEÆ.

From *putamen*, a shell; plants whose fleshy seed-vessel or fruit is frequently covered with a hard woody shell.—In this order are the following genera: Capparis, Cleome, Cratæva, Crescentia, Maregravia, and Morisonia.

26. MULTISILIQUÆ.

From *multus* many, and *siliqua*, a pod; so termed because the fruit consists of several aggregate seed-vessels, which have the appearance of pods.—This order includes the following genera: 1. Pæonia, Aquilegia, Aconitum, Delphinium, Cimicifuga, and Actæa. 2. Dictamnus, Ruta, and Peganum. 3. Nigella, Garidella, Isopyrum, Trollius, Helleborus, Caltha, Ranunculus, Myosurus, and Adonis. 4. Anemone, Atragene, Clematis, and Thalictrum.

27. RHŒADEÆ.

The Poppy tribe.—The order includes the following genera: Argemone, Boeconia, Chelidonium, Papaver, Podophyllum, and Sanguinaria.

28. LURIDÆ.

From *luridus*, pale, livid, or ghastly, alluding to the livid and blueish aspect frequent in the tribe of plants thus denominated. Most of them are herbaceous or perennial.—The genera are, Digitalis, Nicotiana, Atropa, Hyoscyamus, Datura, Physalis, Capsicum, Solanum, Verbascum, Celisia, Lycium, Cestrum, Triguera, Witheringia.

29. CAMPANACEÆ.

From *campana*, a bell: plants with bell-shaped flowers.—In this order are the following genera: Evolvulus, Convolvulus, Ipomœa, Retzia, Falckia, Polemonium, Campanula, Canarina, Rölla, Phyteuma, Trachelium, Jasione, Lobelia, Viola, and Parnassia.

30. CONTORTÆ.

So named from the form of the corolla, which is twisted in a direction contrary to the sun: its border when open resembles a wheel, each segment having generally equal sides, with a shorter side placed under the longer side of the preceding one.—The order consists of trees, shrubs, and succulent plants; and includes the following genera: 1. *Pericarp a follicle:* Tabernamontana, Cameraria, Plumeria, Echites, Nerium, Ceropegia, Vinca, Apocynum, Asclepias, Cynanchum, Periploca, Pergularia, Stapelia, Embothrium, Rhopula, Pleetronia, and Allamanda. 2. *Pericarp a capsule:* Macrocnemum, Manettia, Cinchona, Portlandia, Rondeletia, Hillia, and Genipa. 3. *Pericarp a berry:* Gardenia, Mussænda, Randia, Fagræa, Carissa, Pæderia, Arduina, Lycium, Cestrum, Gynopogon, Willughbei, and Melodinus. 4. *Pericarp a drupe:* Rauwolfia, and Cerbera.

31. VEPRECULÆ.

From *vepres*, a briar or bramble, because the plants which compose this order are pliant shrubs of humble growth; but which, however, do not constitute a true natural assemblage.—The order includes the following genera: Dais, Quisqualis, Direa, Daphne, Gnidia, Lachnæa, Passerina, Stellare, Thesium, Struthiola, Santalum, and Scleranthus.

32. PAPILIONACEÆ

Plants that have papilionaceous flowers, that is, somewhat

resembling a butterfly in shape; of which number are all the leguminous vegetables.—The genera are as follow: Anagyris, Sophora, Abrus, Amorpha, Anthyllis, Arachis, Aspalathus, Borbonia, Crotalaria, Ebenus, Erithrina, Genista, Lupinus, Nissolia, Ononis, Piscidia, Pterocarpus, Spartium, Ulex, Æschynomene, Astragalus, Biserrula, Cicer, Clitoria, Colutea, Coronilla, Cytisus, Dolichos, Ervum, Galega, Geoffroya, Glycine, Glycyrrhiza, Hedysarum, Hippocrepis, Indigofera, Lathyrus, Lotus, Medicago, Ornithopus, Orobus, Phaca, Phaseolus, Pisum, Psoralea, Robinia, Scorpiurus, Trifolium, Trigonella, and Vicia.

33. Lomentaceæ.

From *lomentum*, the meal of beans, in allusion to the pulse-like nature of the plants in this order. They very much resemble the last order.—This includes the following genera: Adenthera, Bauhinia, Cæsalpina, Cassia, Ceratonia, Cercis, Gleditsia, Guilandina, Hæmatoxylon, Hymenæa, Mimosa, Parkinsonia, Poinciana, and Poligala.

34. Cucurbitaceæ.

From *cucurbita*, a gourd, because the plants of this order resemble the gourd in external figure and habit.—The genera are, Gronovia, Anguria, Elaterium, Sicyos, Melothria, Bryonia, Cucurbita, Cucumis, Trichosanthes, Memordica, Fuillea, and Passiflora.

35. Senticosæ.

From *sentis*, a briar or bramble.—In this order are the following genera: Rosa, Rubus, Sibbaldia, Tormentilla, Agrimonia, Alchimilla, Aphanes, Comarum, Dryas, Fragaria, Geum, and Potentilla.

36. Pomaceæ.

From *pomum*, an apple.—The order consists of such plants as have a pulpy esculent fruit, of the apple, berry, or cherry kind; and includes the following genera: Spiræa, Ribes, Sorbus, Cratægus, Mespilus, Pyrus, Punica, Chrysobalanus, Prunus, and Amygdalus.

37. Columniferæ.

From *columna*, a pillar, and *fero*, to bear.—This order consists of plants whose stamens and pistil have the appearance of the column or pillar in the centre of the flower. In all the genera the root is fibrous, in none bulbous or tuberous; the stem in most is herbaceous, but some are large trees. The leaves are never opposite. There are no tendrils. None of them are poisonous, or fetid; and the flowers of most are handsome.—The genera are: Bixa, Corchorus, Heliocarpus, Kiggeleria, Microcos, Muntingia, Thea, Tilia, Turnera, Triumfetta, Ayenia, Grewia, Helicteres, Kleinhovia, Adansonia, Alcea, Althæa, Bombax, Camella, Gossypium, Hermannia, Hibiscus, Lavatera, Malope, Malva, Melochia, Napæa, Pentapetes, Sida, Stewartia, Theobroma, Urena, and Waltheria.

38. Tricoccæ.

This order consists of plants which have a three-cornered capsule, having three cells or internal divisions, each containing a single-seed.—It includes the following genera: Acalypha, Adelia, Andrachne, Buxus, Cambogia, Carica, Cliffortia, Clutia, Cneorum, Croton, Cupania, Dalechampia, Euphorbia, Excœcaria, Guettarda, Hernandia, Hippomane, Hura, Jatropha, Mercurialis, Phyllanthus, Plunkenetia, Ricinus, Solandra, Sterculis, Tragia, and Triallis.

39. Siliquosæ.

From *siliqua*, a pod; plants which have a pod for their seed-vessel.—In this order are the following genera: Arabis, Brassica, Bunias, Cardamine, Cheiranthus, Crambe, Dentaria, Erysimum, Heliophila, Hesperis, Isatis, Sisymbrium, Turritis, Alyssum, Anastatica, Biscutella, Clypeola, Cochlearia, Draba, Iberis, Lepidium, Lunaria, Myagrum, Peetaria, Subularia, Thlaspi, and Vella.

40. Personatæ.

From *persona*, a masque: plants whose flowers are furnished with an irregular, gaping or grinning petal, in figure somewhat resembling the snout of an animal; the stamens are usually four, two of them longest, or sometimes only two in all; style solitary; and the fruit generally superior, of two cells, with numerous seeds.—The following genera are included in this order: Collinsonia, Dianthera, Gratiola, Justitia, Scoparia, Verbena, Veronica, Acanthus, Antirrhinum, Avicennia, Barleria, Bartsia, Besleria, Bignonia, Bontia, Buchnera, Capraria, Chelone, Citharexylon, Clerodendrum, Columnea, Cornutia, Craniolaria, Cymbaria, Dodartia, Durante, Erinus, Euphrasia, Gerardia, Gesneria, Gmelina, Halleria, Lantana, Lathræa, Manulea, Martynia, Melampyrum, Mimulus, Obolaria, Orobanche, Ovieda, Pedicularis, Petrea, Phryma, Rhinanthus, Ruellia, Schwalbea, Scrophularia, Stemodia, Torenia, Tozzia, Vandellia, Vitex, and Volkameria.

41. Asperifoliæ.

The plants in this order are so denominated, because they are usually rough-leaved: their flowers have five stamens, all of equal length.—The genera are, Pulmonaria, Cynoglossum, Borago, Anchusa, Echium, Heliotropium, Lithospermum, Cerinthe, Myosotis, Symphytum, Onosma, Asperugo, Lycopsis, Porana, and Tournefortia.

42. Verticillatæ.

Whorled-flowered plants: the stamens four or two; if four, two longer, or more perfect, than the others.—The genera are, Ajuga, Amathystea, Ballota, Betonica, Cleonia, Clenopodium, Cunila, Dracocephalum, Galeopsis, Glechoma, Horminum, Pyrenæan, Hyssopus, Lamium, Lavandula, Leonurus, Lycopus, Marrubium, Melissa, Melittis, Mentha, Moluccella, Monarda, Nepeta, Ocymum, Origanum, Orvala, Phlomis, Prasium, Prunella, Rosmarinus, Salvia, Satureia, Scutellaria, Sideritis, Stachys, Teucrium, Thymbra, Thymus, Trichostema, and Ziziphora.

43. Dumosæ.

From *domus*, a thicket, because the plants of this order are chiefly shrubs, or low bushy trees, such as form thickets.—The genera are, Sideroxylum, Bumelia, Rhamnus, Phylica, Ceanothus, Büttneria, Chrysophyllum, Achras, Prinos, Ilex, Callicarpa, Euonymus, Rochefortia, Celastrus, Cassine, Viburnum, Sambucus, Rhus, Schinus, and Fagara.

44. Sepiariæ.

From *sepas*, a hedge: the Jasmine tribe.—The genera are, Chionanthus, Fraxinus, Jasminum, Ligustrum, Nyctanthes, Olea, Phillyrea, and Syringa.

45. Umbellatæ.

From *umbella*, an umbel: plants whose flowers grow in umbels. *Linneus* fixes the character of this order in the five stamens, two styles, and two seeds, all umbellate flowers not being comprehended therein.—The genera are, Ægopodium, Æthusa, Ammi, Anethum, Angelica, Apium, Arctopus, Artedia, Astrantia, Athamanta, Bubon, Bunium, Bupleurum, Cachrys, Carum, Caucalis, Chærophyllum, Cicuta, Conium, Coriandrum, Cuminum, Daucus, Echinophora, Eryngium, Herula, Hasselquistia, Heracleum, Hydrocotyle, Imperatoria, Laserpitium, Ligusticum, Oenanthe, Pastinacea, Peucedanum, Phellandrium, Pimpinella, Sanicula, Scandix, Selinum, Seseli, Sium, Sison, Smyrnium, Thapsia, and Tordilium.

46. Hederaceæ.

From *hedera*, Ivy; consisting of Ivy, and a few other genera that seem nearly allied to it; as, Aralia, Cissus, Hedera, Panax, Vitis, and Zanthoxylum.

47. Stellatæ.

From *stella*, a star. Stellate plants are such as have the leaves disposed round the stem in the form of a star with rays.—This order contains herbs, shrubs, and trees; and consists of the following genera: Anthospermum, Asperula, Crucianella, Diodia, Galium, Hedyotis, Knoxia, Lippia, Phyllis, Richardia, Rubia, Sherrardia, Spermacoce, Valantia, Houstonia, Oldenlandia, Ophiorrhiza, Spigelia, Coffea, Cornus, Ixora, Pavetta, and Psychotria.

48. Aggregatæ.

From *aggregare*, to assemble or collect. Plants that have compound flowers, consisting of a number of florets or small flowers, each of which have a proper and common calix.—In this order are the following genera: Statica, Harrogia, Brunia, Protea, Globularia, Leucadendron, Hebenstreitia, Selago, Cephalanthus, Dipsacus, Scabiosa, Knautia, Allionia, Valeriana, Morina, Boerhavia, Circæa, Lonicera, Chiococca, Triosteum, Mitchella, Linnæa, Morinda, Conocarpus, Loranthus, and Viscum.

49. Compositæ.

The great family of compound flowers with separate anthers. In this order, *Linneus* has constructed his first or primary divisions from the different sexes of the florets, which he terms *polygamy;* the subaltern divisions are constructed from the figure of the petals, the disposition of the flowers, the pappus or crown of the seed, the common receptacle, and other circumstances which characterize the subaltern divisions in other authors.—The genera are divided into six sections, viz. 1. *Capitatæ:* Gundelia, Echinops, Sphæranthus, Arctium, Serratula, Carduus, Cnicus, Onopordum, Cynara, Carlina, Gorteria, Atractylis, Carthamus, Centaurea, Zoegea, Elephantopus, Barnadesia, Vernonia, and Liatris. 2. *Semiflosculosæ:* Scolymus, Cichorium, Catananche, Lapsana, Hypochœris, Seriola, Krigia, Hyoseris, Rothia, Andryala, Crepis, Hieracium, Leontodon, Prenanthes, Chondrilla, Lactuca, Sonchus, Apargia, Picris, Scorzonera, Tragopogon, and Geropogon. 3. *Discoideæ:* Gnaphalium, Xeranthemum, Stœhelina, Tanacetum, Matricaria, Carpesium, Chrysanthemum, Pteronia, Baccharis, Osmites, Conyza, Inula, Erigeron, Cineraria, Tussilago, Doronicum, Arnica, Senecio, Solidago, Chrysocoma, Aster, Leysera, Santolina, Anthemis, Anacyclus, Cotula, Athanasia, Achillea, Cacalia, Perdicium, Bellis, Ageratum, Eupatorium, Ethulia, Kuhnia, Bellium, Unxia, Mutisia, Lavenia, and Kleinia. 4. *(Not named)* Corymbium, Helenium, Othonna, Arctotis, Calendula, Osteospermum, and Sclerocarpus. 5. *Oppositifoliæ:* Spilanthus, Bidens, Verbesina, Sigesbeckia, Coreopsis, Silphium, Tetragonotheca, Polymnia, Trixis, Helianthus, Rudbeckia, Milleria, Buphthalmum, Chrysogonum, Melampodium, Tridax, Pectis, Tagetes, Zinnia, Calea, Amellus, Eclipta, Baltimora, Hippia, Oedera, Clibadium, Jungia, Relhania, Boltonia, Meyera, Phaëtusa, Galardia, Berckheya, Craspedia, Didelta, Tetranthus, Rolanda, and Shawia. 6. *Nucumentaceæ:* Stoebe, Tarchonanthus, Artemisia, Seriphium, Eriocephalus, Filago, Micropus, Iva, Parthenium, Ambrosia, Xanthium, and Strumpfia.

50. Amentaceæ.

From *amentum*, a catkin: plants bearing catkins.—The genera are, Salix, Populus, Platanus, Sloanea, Fagus, Juglans, Quercus, Corylus, Carpinus, Betula, Myrica, Pistacia, and Cynomorium.

51. Coniferæ.

From *conus*, a cone, and *fero*, to bear. Plants whose female flowers, placed at a distance from the male, either on the same or distinct roots, are formed into a cone. The plants of this order are mostly of the shrub and tree kind, and retain their leaves all the year.—The genera are, Cupressus, Ephedra, Equisetus, Juniperus, Pinus, Taxus, and Thuja.

52. Coadunatæ.

From *coadunare*, to join or gather together; so termed from the general appearance of the seed-vessels, which are numerous, and being slightly attached below, form all together a single fruitin the shape of a sphere or cone.—The genera are, Annona, Liriodendron, Magnolia, Uvaria, Michaelia, and Xylopia.

53. Scabridæ.

From *scaber*, rough, rugged, or bristly: Plants with rough leaves.—In this order are the following genera: Acnida, Bosea, Cannabis, Cecropia, Celtis, Dorstenia, Ficus, Humulus, Morus, Parietaria, Theligonum, Ulmus, and Urtica.

54. Miscellaneæ.

An heterogeneous assemblage, consisting of such genera as are not connected together by very numerous relations; as, Datisca, Reseda, Poterium, Sanguisorba, Lemna, Pistia, Coriaria, Empetrum, Achyranthus, Amaranthus, Celosia, Gomphrena, Iresine, Phytolacca, Nymphæa, Sarracenia, Cedrela, Swietenia, Corrigiola, Limeum, and Telephium.

55. Filices *(Ferns.)*

Plants which bear their flowers and fruit on the back of the leaf or stalk.—The genera are, Acrostichum, Adianthum, Asplenium, Blechnum, Hemionitis, Isoetes, Lonchitis, Polypodium, Pteris, Trichomanes, Marsilia, Onoclea, Ophioglossum, Osmunda, and Pilularia.

56. Musci *(Mosses.)*

This order is thus described by *Linneus:* Herb leafy; corolla like a hood bearing the style, and covering the capsule, which is closed with a lid. They frequently creep and extend themselves like a carpet upon the ground, also upon trees and stones, being generally collected into bunches and tufts: the smallest are only one-third of an inch in height, and the largest do not exceed five or six.—The genera are, Bryum, Bauxbaumia, Fontinalis, Hypnum, Lycopodium, Mnium, Phascum, Polytrichum, Porella, Sphagnum, and Splachnum.

57. Algæ *(Sea-Weeds, Lichens, &c.)*

The plants of this order are described as having their root, leaf, and stem, entire, or all one. The whole of the sea-weeds, and various other aquatic plants, are comprehended under this division.—The genera are divided into two classes, 1. *Terrestres:* Anthoceros, Blasia, Riccia, Lichen, and Byssus. 2. *Aquaticæ:* Ulva, Fucus, and Conferva.

58. Fungi *(Mushrooms, &c.)*

The genera of this order are, Agaricus, Boletus, Clathrus, Clavaria, Helvela, Hydnum, Lycoperdon, Mucor, Peziza, Phallus, Tuber, &c.

THE END.

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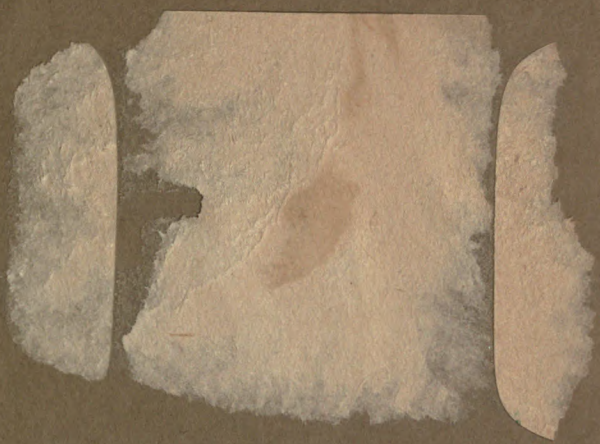
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